

# Exploring recovery and rehabilitation experiences of adults with major and moderate non- neurological traumatic injuries in the north of Scotland.

KROMREY, L.

2024

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**EXPLORING RECOVERY AND REHABILITATION EXPERIENCES OF  
ADULTS WITH MAJOR AND MODERATE NON-NEUROLOGICAL  
TRAUMATIC INJURIES IN THE NORTH OF SCOTLAND**

**LAURA KROMREY**

**EXPLORING RECOVERY AND REHABILITATION EXPERIENCES OF ADULTS WITH  
MAJOR AND MODERATE NON-NEUROLOGICAL TRAUMATIC INJURIES IN THE  
NORTH OF SCOTLAND**

**LAURA KROMREY**

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## ABSTRACT

Laura Kromrey

Doctorate of Physiotherapy

Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the North of Scotland

**Background:** Traumatic injuries can have a significant impact on individuals' short-term and long-term health outcomes. The introduction of trauma networks internationally has improved the survival of individuals with severe physical injuries. With more individuals surviving traumatic injuries, the focus of research and clinical practice has expanded to include assessing long-term outcomes and rehabilitation needs in the traumatic injury population. The North of Scotland Major Trauma Network launched in 2018 and as this network develops, there is an interest in the recovery experiences of individuals following traumatic injuries to inform local practice.

**Aim:** The aim of this thesis was to better understand the recovery and rehabilitation experiences adults with non-neurological major and moderate traumatic injuries. In line with the pragmatic philosophy and applied nature of the research, the findings were used to inform recommendations for clinical practice for the local trauma service.

**Methods:** This thesis presents a systematic review of the qualitative evidence on the recovery experiences of adults with major and moderate non-neurological traumatic injuries using JBI methodology. This was followed by a qualitative study exploring the recovery experiences of adults with major and moderate non-neurological traumatic injuries, conducted using an Interpretive Description approach. Adults who had sustained moderate and major non-neurological traumatic injuries and received acute care at the North of Scotland Major Trauma Centre were recruited from the North of Scotland Major Trauma Centre database via an opt-in postal recruitment strategy. Twenty-one semi-structured interviews were conducted virtually and analysed using framework analysis.

**Key Findings:** The qualitative systematic review identified four synthesised findings from thirteen included reports: 1) *Recovery experiences are highly individual and influenced by a range of intrapersonal factors*, 2) *Enduring physical and psychological consequences impact on recovery experiences following traumatic injuries*, 3) *Adults recovering from major and moderate traumatic injuries access a range of health and care services, as well as social support, during recovery*, and 4)

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*Patient – healthcare professional communication and information provision are valued by adults recovering from major and moderate traumatic injuries.*

The qualitative study identified three themes: 1) *Management of physical impairments and psychological aspects throughout recovery*, 2) *Recovery, rehabilitation, and participation experiences*, and 3) *Support, services, and wider impact of injury throughout recovery*.

The findings from the systematic review and the qualitative study were used to create recommendations for the local trauma service, including valued practices to continue, recommended information provision, considerations for health care professionals, and collaboration suggestions. Recommendations for future research were identified regarding development of information provision strategies and evaluation of accessibility of the local rehabilitation services.

**Conclusions:** This doctoral thesis has comprehensively explored the experiences of adults following traumatic injuries by synthesising the current qualitative evidence in the literature and exploring recovery experiences of adults in the North of Scotland. The qualitative study contributes new knowledge to the literature in the field as there is no previous research on the recovery experiences of adults with traumatic injuries in Scotland. The findings from this thesis were used to inform recommendations for the local trauma service and areas for future research.

**Key words:** traumatic injuries, major trauma, trauma network, recovery, rehabilitation, qualitative research

**Word count:** 54,477

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I would also like to thank the clinicians at the North of Scotland Major Trauma Network: Dr Angela Gall, Ms. Jackie Burnett, and Ms. Lesley Stables, thank you for your guidance, support, and dedication to this project. I also want to extend my gratitude to the trauma coordinators who were instrumental in the success of recruiting participants – Alison Coutts, Catherine Houston, and Nina Currie, many thanks for your assistance.

I would also like to thank my NHS Grampian physiotherapy colleagues that I had the opportunity to work with as a bank physiotherapist throughout this programme. Research can be arduous at times and having clinical work helped keep me grounded and focused on the big picture: to make a difference in the North of Scotland community.

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## RESEARCHER REFLEXIVITY AND POSITIONALITY

My name is Laura Kromrey and I am originally from Alaska, USA. I decided to move to Scotland and apply for the Doctorate of Physiotherapy (DPT) programme at Robert Gordon University following an amazing study-abroad year at the University of Stirling, Scotland. My main interest in this programme was in the way it included both clinical learning and research skills that would allow me to continue to develop in clinical and academic roles throughout my career.

Prior to this programme, I completed a Bachelor of Science in Biological Sciences degree at the University of Alaska Fairbank, which was where I first got involved in research. I led two small-scale research projects; one was a lab-based quantitative project evaluating brown adipose tissue in Alaskan sled dogs and the second project was a qualitative study on the experiences of parents/carers with children attending an intensive paediatric therapy clinic in Fairbanks, Alaska. Both research projects were incredible opportunities that enhanced my knowledge and research skills and were ultimately what led me to apply for the DPT programme.

My knowledge on the topic area of trauma care came from reading the literature in the field and from my physiotherapy student placements in multiple specialties and regions around Scotland. My interest in qualitative research originated from my previous qualitative research experience and the understanding that qualitative research can provide valuable information on how individuals and communities access healthcare services and make decisions about their health.

Throughout the undertaking of this degree programme, I have lived in Scotland for 4.5 years and have worked part-time as an NHS physiotherapist after qualifying in 2021. At the start of the project, I had minimal expectations about what this research would entail and what areas this topic would encompass, as I was still learning about the NHS healthcare system as a novice clinician and was in the process of familiarising myself with the trauma care field. I was aware of the possible risks that conducting this research could pose to both participants and researcher, in terms of mental health and psychological wellbeing. I also considered that timing of the research meant that participants' care and recovery experiences could have been impacted by the COVID 19 pandemic and subsequent lockdowns, as these events impacted greatly on individuals' lives and how healthcare services functioned internationally. Lastly, I was aware of the importance of reflexivity while undertaking this research, which allowed me to fully consider how my views, knowledge, and experiences from my position as a novice researcher and physiotherapist could influence this research.



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## OUTPUTS

### Registered Protocol

Kromrey, L., Gall, A., Burnett, J., Stables, L., Alexander, L. *Recovery experiences of adults with moderate and major trauma after discharge from the acute care setting: A qualitative systematic review protocol*. PROSPERO 2022 CRD42022338736 Available from:

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### Oral Presentations

Kromrey, L., Cooper, K., Gall, A., Burnett, J., Stables, L., Alexander, L. *Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland*. Presented as in-service to staff at Neurological Rehabilitation Unit, Woodend Hospital. 30 May 2023. Presented on ongoing qualitative systematic review. 10 minutes. 5 attendees, in person.

Kromrey, L., Cooper, K., Gall, A., Burnett, J., Stables, L., Alexander, L. *Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland*. Presented to the North of Scotland Major Trauma Centre multidisciplinary team. 7 June 2023. Presented on the ongoing systematic review and progress on the primary qualitative study. 20 minutes. ~15 attendees, in person.

Kromrey, L., Cooper, K., Gall, A., Burnett, J., Stables, L., Alexander, L. *Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland*. Presented at the annual Scottish branch of the British Society of Physical & Rehabilitation Medicine (BSPRM). 8 June 2023. Presented on the ongoing systematic review and progress on the primary qualitative study. 20 minutes. ~20 attendees, in person and virtual.

Kromrey, L., Cooper, K., Gall, A., Alexander, L. *Exploring the recovery experiences of adults with major traumatic injuries in the north of Scotland*. Presented at Robert Gordon University's annual Three Minute Thesis competition. 9 June 2023. Presented on qualitative study topic. 3 minutes. ~20 attendees, virtual.

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Kromrey, L., Cooper, K., Gall, A., Burnett, J., Stables, L., Alexander, L. *Recovery experiences of adults with moderate and major traumatic injuries after discharge from the acute care setting: a qualitative systematic review*. Presented at the Lothian Health and Care Professions Research Conference. 7 November 2023. Presented on methodology and findings of qualitative systematic review. 15 minutes. ~20 attendees, in person.

Kromrey, L., Cooper, K., Gall, A., Alexander, L. *Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the North of Scotland*. 10 April 2024. Presented findings and recommendations of primary study for discussion with clinicians at the North of Scotland Major Trauma Centre, Aberdeen Royal Infirmary. 15 minutes, ~ 10 clinical attendees, in person.

## **OUTPUTS IN PREPARATION**

Kromrey, L., Cooper, K., Gall, A., Burnett, J., Stables, L., Alexander, L. *Recovery experiences of adults with moderate and major traumatic injuries after discharge from the acute care setting: a qualitative systematic review*. JBI Evidence Synthesis.

- Final preparation – manuscript to be submitted for publication in May 2024

Kromrey, L., Cooper, K., Gall, A., Alexander, L. *Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the North of Scotland*.

- Manuscript in preparation – to be submitted late 2024

Executive summary of primary study and findings to provide to the North of Scotland Trauma Network and Scottish Trauma Network.

- In preparation – to be finalised summer 2024

Lay summary of primary research findings to send to study participants and for use by the North of Scotland Major Trauma Network.

- In preparation – to be finalised summer 2024

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## ONGOING DISSEMINATION PLAN

Kromrey, L., Cooper, K., Gall, A., Alexander, L. *Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the North of Scotland*. 02 May 2024. Presenting primary study and findings at North of Scotland Trauma Network Rehabilitation and Repatriation Meeting. 20 minutes, virtual.

Kromrey, L., Cooper, K., Gall, A., Alexander, L. *Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the North of Scotland*. 02 May 2024. Presenting primary study and findings as plenary talk at North of Scotland Trauma Network Event. 25 minutes, in person.

Submitted abstracts for the systematic review and primary study for the Chartered Society of Physiotherapy annual conference. October 2024 - TBD

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## LIST OF ABBREVIATIONS

<b>ADLs</b>	Activities Of Daily Living
<b>AHP</b>	Allied Health Professional
<b>AIS</b>	Abbreviated Injury Score
<b>ARI</b>	Aberdeen Royal Infirmary
<b>ATR</b>	Australian Trauma Registry
<b>AUS</b>	Australia
<b>AusTQIP</b>	Australian Trauma Quality Improvement Program
<b>BMJ</b>	British Medical Journal
<b>BPS</b>	Biopsychosocial Model
<b>BSRM</b>	British Society of Rehabilitation Medicine
<b>CAQDAS</b>	Computer Assisted Qualitative Data Analysis Software
<b>CBT</b>	Cognitive Behavioural Therapy
<b>CerQual</b>	Confidence in the Evidence from Reviews Of Qualitative Research
<b>ConQual</b>	Confidence Of Synthesised Qualitative Findings
<b>CHI</b>	Community Health Index Number
<b>CSP</b>	Chartered Society Of Physiotherapy
<b>DPT</b>	Doctorate In Physiotherapy
<b>EBM</b>	Evidence Based Medicine
<b>EBP</b>	Evidence Based Practice
<b>EQ-5D</b>	European Quality of Life Five Dimension ( <i>outcome measure</i> )
<b>GCS</b>	Glasgow Coma Scale
<b>GDPR</b>	General Data Protection Regulation
<b>GOS</b>	Glasgow Outcome Scale
<b>GP</b>	General Practitioner
<b>HCP</b>	Healthcare Professional
<b>HDU</b>	High Dependency Unit
<b>IASP</b>	International Association for the Study of Pain
<b>ICD</b>	International Classification of Diseases
<b>ICF</b>	International Classification of Functioning, Disability, And Health Framework
<b>ICU</b>	Intensive Care Unit
<b>ID</b>	Interpretive Description
<b>IPA</b>	Interpretative Phenomenological Analysis
<b>ISS</b>	Injury Severity Score
<b>KPI</b>	Key Performance Indicator
<b>MBC</b>	Motorbike Collision
<b>MDT</b>	Multidisciplinary Team
<b>MOI</b>	Mechanism Of Injury
<b>MSK</b>	Musculoskeletal
<b>MS Teams</b>	Microsoft Teams
<b>MTC</b>	Major Trauma Centre
<b>MTN</b>	Major Trauma Network
<b>MVC</b>	Motor Vehicle Collision
<b>NHS</b>	National Health Service
<b>NICE</b>	National Institute For Health And Care Excellence
<b>NIHR</b>	National Institute for Health and Care Research
<b>NISS</b>	New Injury Severity Score

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<b>NoS MTC</b>	North Of Scotland Major Trauma Centre
<b>NoS MTN</b>	North Of Scotland Major Trauma Network
<b>NRC</b>	National Rehabilitation Centre
<b>NRS</b>	Numerical Rating Scale
<b>NRTAC</b>	National Road Trauma Advisory Council ( <i>AUS</i> )
<b>PPI</b>	Public And Patient Involvement
<b>PRISMA</b>	Preferred Reporting Items For Systematic Reviews And Meta-Analyses
<b>PROM</b>	Patient Reported Outcome Measure
<b>PTG</b>	Post-Traumatic Growth
<b>PTSD</b>	Post-Traumatic Stress Disorder
<b>RESTORE</b>	Recovery After Serious Trauma--Outcomes, Resource Use And Patient Experiences ( <i>study name</i> )
<b>RGU</b>	Robert Gordon University
<b>RIOS</b>	Rib Injury Outcomes Study ( <i>study name</i> )
<b>RR&amp;R</b>	Recovery, Re-enablement and Rehabilitation
<b>RTA</b>	Reflexive Thematic Analysis
<b>RTA</b>	Road Traffic Accident
<b>SAS</b>	Scottish Ambulance Service
<b>SCI</b>	Spinal Cord Injury
<b>SIGN</b>	Scottish Intercollegiate Guidelines Network
<b>SNAP</b>	Scottish National Audit Programme
<b>STAG</b>	Scottish Trauma Audit Group
<b>STN</b>	Scottish Trauma Network
<b>TBI</b>	Traumatic Brain Injury
<b>TOP</b>	Trauma Outcome Profile
<b>TU</b>	Trauma Unit
<b>UK</b>	United Kingdom
<b>USA</b>	United States Of America
<b>VAS</b>	Visual Analogue Scale
<b>VSTR</b>	Victoria State Trauma Registry
<b>WHO</b>	World Health Organization

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## CHAPTER 1: INTRODUCTION

### 1.1 Introduction

The aim of this thesis was to explore the recovery and rehabilitation experiences individuals with major and moderate traumatic injuries. This introductory chapter provides the background and context to the thesis, including the definition of traumatic injuries, the classification and terminology used in traumatic injury populations, and the management of traumatic injuries. This research was undertaken in partnership with the North of Scotland Major Trauma Network (NoS MTN), therefore the information provided in this chapter focuses on trauma services and policy within the UK. The Scottish Trauma Network (STN) and the NoS MTN are introduced, including relevant background information and the patient pathway through the trauma network. This chapter concludes by providing the scope and definitions for terms used in this thesis, setting the scene for the next chapter, which presents a qualitative systematic review of the current literature on recovery experiences following traumatic injuries.

### 1.2 Evi's Story

I would like to start with the story of Evi, a major trauma survivor, who shared her story on the AfterTrauma website. Evi was involved in a road traffic accident (RTA) August 2015 and following the accident, she spent two months in a Major Trauma Centre in England recovering and healing. Following her stay in hospital, this was her account of leaving hospital and her initial time at home:

*“Two months down the line I went home. To be honest I was petrified to go. For me it meant leaving my “safety net”, my “new home” and the new friends I had made. I was leaving to go back home, which was at that time in the middle of nowhere, and where I lived with my ex-partner, so not the friendliest surrounding. I was not allowed to weight b[ear] for 6 months and all I really wanted was to fly back home to my family but couldn’t.*

*I didn’t tell anyone how scary the thought of leaving hospital was for me, as everyone around was so cheerful and happy for me to reach that goal of leaving, so why to be scared, right?!! I was prepared. We had practiced. So I went, said my good byes and huge thank yous.*

*One month after being at home I hit rock bottom. The scariest thing is I did not see it coming, because that was not me. I am normally a positive person, the glass*

*is full. The smallest tasks like getting to a bathroom in a wheelchair, or putting my washing on. Not even that, just to gather the clothes for washing was an enormous task. The pain and constant exhaustion all of sudden became my non-stop companion.*

*Also my location wasn't ideal, and friends having their own families and jobs to do couldn't visit as often as they hoped. I became very lonely and isolated. I became emotionally and physically drained. To the point that I could see no way out and just thought it might be better for everyone around if there was no me. Then, just at that moment I got a green light for flying and could fly back home. Where I allowed myself rest and wasn't alone anymore.*

*From then on, I felt very wary of any bad feelings. I was later diagnosed with a PTSD. I also had to have an operation on my arm for the nerve injury damage and undergo another operation on my pelvis as the screws had started to give me problems. Almost after a year from the accident I could barely sit or stand up without pain. But my last operation was last November and since then I've been feeling better." Evi (AfterTrauma 2017)*

Oftentimes in the view of healthcare, the story of people with traumatic injuries starts when they are admitted into hospital and ends when they are discharged, but leaving the hospital is just the start of the next chapter in patients' lives (Salim et al. 2023). In her story, Evi shares her experiences of managing at home following a serious injury and the different types of challenges she faced during this time, such as physical limitations, pain, fatigue, psychological challenges, lack of support, and further surgeries.

Each individual's recovery experiences are unique and Evi is just one of the many people that experience traumatic injuries every year in the UK. Learning more about what happens to people after leaving the hospital is important because it enables healthcare providers to be able to provide optimal services for patients, and what better way to explore this than to learn from the individuals' themselves? This thesis explores what is already known about the recovery and rehabilitation experiences of people following traumatic injuries and provided a chance for individuals in the North of Scotland to share their recovery stories.



## 1.3 Traumatic Injuries

### 1.3.1 What are Traumatic Injuries?

Trauma can be defined as, “a wound, or external bodily injury in general; also the condition caused by this; traumatism” (Oxford English Dictionary 2023). This definition captures the two different aspects of trauma: a wound or bodily injury is also known as physical trauma or a traumatic injury, and the latter part referring to the distress or psychological trauma that can come from an injury. The following definition of the cause and impact of trauma is from the UK government’s guidance on trauma-informed practice:

*Trauma results from an event, series of events, or set of circumstances that is experienced by an individual as harmful or life threatening. While unique to the individual, generally the experience of trauma can cause lasting adverse effects, limiting the ability to function and achieve mental, physical, social, emotional or spiritual well-being. (Office for Health Improvement & Disparities 2022)*

An important part of this definition is that the experience of trauma is unique to the individual and can cause lasting adverse effects. These lasting adverse effects can include psychological challenges due to the unexpected nature of the injury (AfterTrauma 2023). While physical and psychological trauma can occur concurrently, the focus of this thesis was physical traumatic injuries, defined as, “any major or minor injury that requires admission to hospital at the time of injury, including musculoskeletal, visceral and nerve injuries, soft tissue damage, spinal injury, limb reconstruction and limb loss” (NICE 2022 p. 6).

## 1.4 Classification

Physical traumatic injuries have many causes and often involve a combination of different types of injuries (e.g. fractures, soft tissues damage, internal injuries). Due to the numerous variation and combinations, traumatic injuries are described most commonly in two ways; anatomically or by severity.

### 1.4.1 Anatomical Classification

One way to classify traumatic injuries is based on the anatomical injuries sustained. The *International Classification of Diseases* (ICD) is a classification system used for mortality coding and classifications, first published by the World Health Organisation (WHO) in 1999 (National Center for Health Statistics 2015). Now updated to the ICD-11, it is an extensive list of injury diagnosis codes for injuries and is

based on body region and nature of injury and is used for providing statistics on mortality and morbidity data worldwide (National Center for Health Statistics 2021). The ICD-11 also includes external cause of injury codes, referring to mechanism (i.e. the vector that transfers energy to the body) and the intent of the injury (National Center for Health Statistics 2021). The injury diagnosis codes are thorough and are used to document specific anatomical injuries, with each type of injury having a unique code. There are around two hundred different codes under the ICD-11 category '*Injury, poisoning and certain other consequences of external causes*' (i.e. S00 – T88 codes), which are used in medical documentation of patients' specific injuries (World Health Organization 2023). With so many different individual injury codes, this method of classifying injuries presents a challenge for evaluating traumatic injury populations as it requires documentation of multiple injuries in multiple areas of the body, in cases of serious injuries. When trying to compare severe trauma populations, the large number of possible diagnosis codes and code combinations makes the use of individual anatomical codes impractical for comparing traumatic injury populations for research or audit purposes (Baker et al. 1974). To address this challenge, another method of describing traumatic injuries is based on injury severity is used.

#### 1.4.2 Injury Severity Classifications

Injury severity considers the impact that multiple injuries have on a person's morbidity and mortality (Baker et al. 1974). Assigning a numerical value to indicate the severity of an injury or multiple injuries allows clinicians and researchers to triage and treat patients with multiple injuries, as well as create prediction models and evaluate outcomes (Baker and O'Neill 1976). When classifying injuries based on severity, traumatic injuries severity is seen as a continuum, with less severe injuries described as '*minor traumatic injuries*' and '*major traumatic injuries*' describing the most severe injuries.

The differentiation of injury severity for multiple injuries was important because this was observed to be related to patient mortality and morbidity (Baker et al. 1974), with injury severity interpreted as "*likelihood of a fatal or disabling outcome*" (Osler, Nelson and Bedrick 1999 p. 10). Using injury severity addressed some of the original issues that were present with using anatomical injury codes when comparing traumatic injury populations due to the numerous variations of code combinations, but this was replaced with the challenge of how best to define severity of injuries, and this debate is still ongoing.

#### *1.4.2.1 Abbreviated Injury Score*

The initial evaluation and measurements of traumatic injuries and their severity was recorded in the 1950's with research on injuries from light-plane accidents, followed by research on injuries from automobile crashes, which led to the creation of the first Abbreviated Injury Scale (AIS) in 1971 (Chawda et al. 2004). The AIS was the first injury-description system and has since been modified multiple times to improve the injury classification (Chawda et al. 2004), with the most up-to-date version being the AIS 2015 (The Association for the Advancement of Automotive Medicine 2016).

AIS classifies injuries anatomically by scoring the severity of individual injuries by body region on a scale from one to six, with one indicating minor injury and six as maximal injury, used for injuries that “invariably result in death given our present emergency care capabilities” (Baker and O’Neill 1976 p. 882; Association for the Advancement of Automotive Medicine 2021). AIS has injury descriptors for injuries in nine body regions including the head, face, neck, thorax, abdomen, spine, upper extremities, lower extremities, and external (Stevenson et al. 2001). AIS is used globally and provides the basis for multiple other injury severity rating scales, such as Injury Severity Score (ISS), New Injury Severity Score (NISS), Trauma and Injury Severity Scores (TRISS), and A Severity Characterization of Trauma (ASCOT) (Association for the Advancement of Automotive Medicine 2021).

#### *1.4.2.2 Injury Severity Score*

The most common classification system for injury severity is the Injury Severity Score (ISS), developed in 1974 (Baker et al. 1974). ISS was designed to provide a “numerical description of overall severity of injury in persons who have sustained injury to more than one area of the body” (Baker et al. 1974 p. 187). ISS is calculated by adding the squares of AIS for the three most severely injured of the different body regions (Baker et al. 1974). AIS was known to relate to patient survival and was already used clinically at the time, so ISS was straightforward to implement and found to accurately account for how additional injuries negatively impacted patient mortality (Baker and O’Neill 1976). ISS is used to describe severity of a patient’s injuries, with an ISS score of less than nine classified as minor trauma, nine to fifteen as moderate trauma, and greater than fifteen as major trauma with a maximum score of 75 (Public Health Scotland 2021a).

### 1.4.2.3 Other Trauma Classification Systems

Since the development of ISS in 1974, many other classification systems for traumatic injuries have been published, as seen in Table 1. These include anatomical scores, which provide an overall score based on the grade of an injury (or multiple injuries), physiological scores, which use physiological variables such as Glasgow Coma Score (GCS) or respiratory rate, and combination scores that combine both anatomical and physiological scores (Darbandsar Mazandarani et al. 2016). The strength of anatomical scores is that they are quantifiable by clinical evaluation and typically remain constant after the initial injury, compared to the physiological scores which change throughout treatment of the patient (Russell et al. 2011). Physiological scores are more reproducible as they are based on objective assessments (i.e. respiratory rate) and do not require interpretation by an experienced healthcare professional (HCP) (Russell et al. 2011). The combination scores have been found to be the most reliable in predicting patient outcomes, but are more complicated to calculate and therefore, challenging to use in clinical settings (Russell et al. 2011; De Munter et al. 2017).

Attempts have been made to compare these classification systems in traumatic injury populations, but the heterogeneity of traumatic injury populations and study methodology has been identified as a large challenge in multiple reviews and studies.

A systematic review focused on mortality prediction models in the general trauma population literature identified that the TRISS was the most commonly used prediction model, with Revised Trauma Score (RTS), ISS, age, and mechanism of injury as the most commonly used predictors across the literature, and ISS being the most common anatomical variable used (De Munter et al. 2017). The authors reported that heterogeneity in the included study and prediction model characteristics, as well as methodological quality of the included studies, which limited their ability to perform a meta-analysis (De Munter et al. 2017). Another systematic review attempted to assess the predictive performances of the ISS, NISS, TRISS, and ICISS to identify patient mortality and also identified high heterogeneity in the study populations, so were also unable to perform a meta-analysis (Tohira et al. 2012). This review found that the NISS predicted mortality for blunt trauma injuries better than ISS, but ISS had better predictive performance for penetrating trauma, indicating that mechanism of injury is a consideration in assessing mortality prediction models (Tohira et al. 2012). Similarly, a systematic review comparing the ISS and the NISS for accuracy in predicting mortality of trauma patients found that both measures were comparable, but again reported the challenge of high heterogeneity in the studies included in the review (Deng et al. 2016).

**Table 1 – Trauma Scoring Systems**

<b>Trauma Scoring System</b>	<b>Type of scoring system</b>	<b>Definition</b>	<b>Purpose and uses</b>
<b>Abbreviated Injury Score (AIS)</b>	Anatomical	Classes individual injury by body region and severity level (1-6) 1 = minor, 6 = maximal injury (Association for the Advancement of Automotive Medicine 2021)	Standardised terminology for describing and ranking injuries by severity. Used in other classification systems (e.g. ISS, NISS, AP, TRISS) Retrospective scoring used in research, reporting of trauma populations.
<b>Injury Severity Score (ISS)</b>	Anatomical	Sum of the squares of the highest AIS grade in each of the three most severely injured body areas (Baker et al. 1974 p. 190) Scores from 0 – 75.	Retrospective scoring used in research, reporting of trauma populations.
<b>New Injury Severity Score (NISS)</b>	Anatomical	Sum of the three most severe injuries (AIS), regardless of body region (Javali et al. 2019) Scores 0 – 75, will be same or higher than ISS	Similar to ISS, retrospective scoring.
<b>ICD Injury Severity Score (ICISS)</b>	Anatomical	Empirically-derived survival score based on ICD classifications of traumatic injuries (Berecki-Gisolf, Tharanga Fernando and D’Elia 2022)	Similar to ISS, reporting of prevalence and incidence of severe injury (Berecki-Gisolf, Tharanga Fernando and D’Elia 2022)
<b>Anatomic Profile (AP)</b>	Anatomical	Description of serious injuries (AIS $\geq$ 3) with 3 components: A) head/brain or spinal cord, B) thorax or front of neck, C) all remaining serious injuries (Copes et al. 1990)	Retrospective scoring used to calculate probability of survival.
<b>Revised Trauma Score (RTS)</b>	Physiological	Predicting mortality using Glasgow Coma Scale, systolic blood pressure, & respiratory rate (Champion et al. 1989)	Two versions: triage tool in acute care (triage-RTS) and outcome evaluations of traumatic injuries (Champion et al. 1989).

<b>Trauma and Injury Severity Scores (TRISS)</b>	Combination	Probability of survival of a patient using ISS, RTS, and patient's age (Javali et al. 2019)	Retrospective scoring. Used for audits and system performance, not individual outcomes. Comparing performance between different trauma systems or against national standards (Russell et al. 2011).
<b>Acute Physiology, Age, Chronic Health Evaluation (APACHE)</b>	Physiological	Risk of mortality based on reason for ICU admission, age, sex, race, pre-existing comorbidities, and location prior to ICU admission (Knaus et al. 1991)	Similar to TRISS. Predicting mortality of critically ill patients admitted to ICU setting.
<b>A Severity Characterization of Trauma (ASCOT)</b>	Combination	Probability of death based on Glasgow Coma Scale, systolic blood pressure, respiratory rate, patient age, AIS-85 anatomical injury scores (Champion et al. 1990)	Retrospective scoring. Aimed to relate patient injuries with other outcomes such as disability, length of stay, and resource requirements (Champion et al. 1990)

Abbreviation: International Classification of Disease (ICD), intensive care unit (ICU)

Many studies have identified the need for a more comprehensive classification system for use in traumatic injury populations, but amidst the ongoing challenges and efforts, the ISS is widely used in trauma population literature (De Munter et al. 2017) and is currently used for reporting in trauma registries internationally in Australia, the UK, and Canada (Trauma Registry Information Specialists of Canada 2016; The Trauma Audit & Research Network 2020; Australian Trauma Quality Improvement (AusTQIP) Collaboration 2021; Public Health Scotland 2023). ISS is also the classification system that is currently used in Scotland, therefore was used as the classification system to define injury severity in this thesis (Public Health Scotland 2022).

For this thesis, the population of interest was those with more severe traumatic injuries, as previous research suggesting that individuals with severe injuries have reduced functional outcomes and quality of life (Holbrook et al. 1999; Ringburg et al. 2011). This thesis included both moderate and major traumatic injury populations, based on ISS score (i.e.  $ISS \geq 9$ ) as this included the full range of more severe injuries. This decision to consider moderate injuries was informed by clinical input from

the NoS MTN clinicians, as they reported observing patients with moderate injuries still experienced challenges with their functional abilities and quality of life at time of hospital discharge (Burnett, J., personal communication by conversation. 06 January 2022). An example of this is that a patient could have an injury that required an amputation of a limb and have a moderate ISS because the injury was not life threatening, but the life-changing impact of this injury is arguably equivalent to that of other severe injuries.

## 1.5 Terminology

Alongside the creation of trauma scoring systems, terminology used for traumatic injuries has developed and currently, there is a large range of terminology used for “traumatic injuries” in the literature (see Table 2). This is apparent when focusing on severe traumatic injuries, terminology varies considerably, with many terms used interchangeably and not specific to the injuries sustained (Thompson, Hill and Shaw 2019; Thompson et al. 2021; Wake et al. 2021). This creates a challenge for research and audit projects because it is unclear whether trauma populations are comparable and appropriate for further evidence synthesis (see section 2.9.2).

The terms in Table 2 are examples of the main terms used in the literature to describe more severe traumatic injuries. In relating to the initial traumatic injury definition in Section 1.3.1, all of these terms related to physical traumatic injuries. There are similarities between ‘multiple trauma’ and ‘polytrauma’, with both referring to ‘two or more injuries’ that result in impairments or disability. The term ‘major trauma’ is similar to these as well, as it also includes multiple injuries, but this term is more related to injury severity as it originated from the ISS scoring system, describing injuries in terms of their consequences (e.g. life-threatening, lifechanging, permanent disability).

‘Complex musculoskeletal trauma’ and ‘orthopaedic trauma’ are also comparable, as they refer to severe injuries of the musculoskeletal system (e.g. bone fractures, soft tissue damage). The last two terms are the two main types of neurological injuries, traumatic brain injuries (TBIs) and spinal cord injuries (SCIs), which refer to injuries of the central nervous system.

From these examples, the differentiating factors are related to the number or severity of the injuries, as well as the anatomical structures affected (e.g. musculoskeletal versus neurological injuries). The implications of injury severity have been described in the previous section (section 1.4.2), but anatomical structures affected are equally as important, as this is clinically relevant and affects the healing and functioning of body systems, and therefore patient’s outcomes and experiences.

**Table 2 - Traumatic Injury Terminology**

<b>Term</b>	<b>Definition(s)</b>
<b>Major Trauma</b>	<p>“serious and/ or multiple injuries where there is a high likelihood of death or permanent disability” (Public Health Scotland 2021a)</p> <p>“a potentially life threatening injury or injuries with the potential to cause the loss of a major limb” (NICE 2016a p. 309)</p> <p>“significant injury or injuries that have potential to be life-threatening or life-changing sustained from either high energy mechanisms or low energy mechanisms in those rendered vulnerable by extremes of age” (Thompson et al. 2021 p. 1)</p> <p>ISS ≥ 15 (Thompson, Hill and Shaw 2019; Public Health Scotland 2020a)</p> <p>ISS ≥ 12 (Palmer, Gabbe and Cameron 2016)</p>
<b>Multiple Trauma</b>	<p>“presence of two or more separate injuries, at least one or a combination of which endangers the patient’s life” (Frink et al. 2017 p. 497)</p> <p>“the presence of 2 or more injuries to physical regions or organ systems, 1 of which may be life threatening, resulting in physical, cognitive, psychological or psychosocial impairments or disability” (Al Hanna et al. 2020 p. 1)</p>
<b>Poly Trauma (or polytrauma)</b>	<p>“two or more injuries to physical regions or organ systems, one of which may be life threatening, resulting in physical, cognitive, psychological, or psychosocial impairments and functional disability” (Gray et al. 2018 p. 34)</p> <p>“Patients with associated injury (i.e. two or more severe injuries in at least two areas of the body), or with a multiple injury (i.e. two or more severe injuries in one body area). Also known as multisystem trauma.” (NICE 2016a p. 312)</p>
<b>Complex musculoskeletal trauma/injury</b>	<p>“Open or multiple lower limb fractures; multiple fractures including spinal and/or a combination of upper limb and lower limb fractures; Complex pelvic and/or acetabular injury; Polytrauma with orthopaedic injury e.g. pelvic fracture and liver laceration” (Silvester 2011 p. 487)</p> <p>“multiple fractures, open fractures, high energy pelvic injuries and polytrauma with related orthopaedic injury” (Silvester, Trompeter and Hing 2021 pp. 1–2)</p>
<b>Orthopaedic trauma</b>	<p>“severe injury to the elements of the musculoskeletal system (muscles, joints, ligaments, bones, and soft tissue)” (Orthopaedic Associates 2018)</p>
<b>Traumatic brain injury (TBI)</b>	<p>“an alteration in brain function, or other evidence of brain pathology, caused by an external force” (Menon et al. 2010 p. 1637)</p> <p>Severity rated using GCS: mild (13-15), moderate (9-12), severe (3-8) (Zangari, Gritti and Biroli 2022)</p>
<b>Spinal cord injury (SCI)</b>	<p>“an acute traumatic injury to the spinal cord that leads to varying degrees of motor and/or sensory deficits and paralysis” (Hagen et al. 2012 p. 831)</p> <p>Severity rated using ASIA: A (no motor/sensory function) to E (normal motor/sensory function) (Roberts, Leonard and Cepela 2017)</p>

*Abbreviations:* The American Spinal Injury Association Impairment Scale (ASIA), Glasgow Coma Scale (GCS), Injury Severity Score (ISS)



Neurological injuries differ from injuries to other body tissues, as neural tissue has limited ability to heal, with nerve regeneration lasting for months to years (Yang and Chung 2012). Clinically, this indicates that patients with neurological injuries are at high risk for poor functional outcomes and long recovery times (Nas et al. 2015; McCrea et al. 2021). Traumatic brain injuries can result in long-term disability due to altered cognitive functioning and functional limitations (Wilson et al. 2017). While some longitudinal research has found that patients with moderate or severe TBIs can have positive functional gains in the year following the injury, many patients experience increased morbidity and mortality rates in the decades following the injury (Wilson et al. 2017; McCrea et al. 2021). Traumatic brain injuries can also result in changes in cognition and behaviour, resulting in burden on families and carers (Fleminger and Ponsford 2005). Patients with SCIs can experience recovery of motor function in the first six to nine months post-injury, depending on injury type (Kirshblum et al. 2021). Long-term, patients with SCIs experience reduced independence and functional ability and are at risk of developing other related complications (e.g. neurogenic bladder and bowel symptoms, spasticity, contractures, and pulmonary and cardiovascular problems) (Nas et al. 2015).

Due to the prognosis of neurological injuries, management of individuals with TBIs and SCIs is complex and involves the input from many different medical and rehabilitation specialties. This has been identified in the research and production of guidance for specialised rehabilitation of neurological injuries (Parent et al. 2011; Brasure et al. 2013; SIGN 2013; Mazwi, Adeletti and Hirschberg 2015; Turner-Stokes et al. 2015; Harvey 2016; NHS England CRG 2020; Ong, Wilson and Henzel 2020; Li et al. 2021; BSRM 2023). In comparison, there has been less research into the management and rehabilitation of patients with non-neurological traumatic injuries, but is a topic of growing interest (Ekegren et al. 2020).

While research into specific traumatic injury populations is important, patients with neurological injuries only represent a portion of patients that are hospitalised following a traumatic injury. In 2022, only 6% of the reported 7,531 patients with traumatic injuries in Scotland were admitted to acute care under the *Neurosurgery* specialty (e.g. presenting with a major neurological injury) (Public Health Scotland 2023). Conversely, *Trauma and orthopaedic surgery* was the most common specialty for patients with traumatic injuries to be admitted to (48%), indicating the large proportion of non-neurological traumatic injuries in the Scottish traumatic injury population.

Based on the previous evidence for injury severity and the clinical relevance of the injury type, the focus of this thesis is on moderate and major non-neurological traumatic injuries because of clinical

relevance, the prevalence in Scotland, and the growing interest in this patient population to evaluate recovery outcomes and explore perspectives of these individuals throughout their recovery.

## 1.6 Management

Historically, traumatic injuries have been the leading cause of death and disability in people under forty years old worldwide (Krug, Sharma and Lozano 2000). In 2019, approximately 4.3 million injury-related deaths occurred worldwide, representing 7.9% of total deaths (Global Health Metrics 2020). Injuries including road injuries, falls, and self-harm are in the top twenty-five leading causes of global 'disability-adjusted life years' for all age groups according to the 2019 Global Burden of Diseases (GBD) study (Vos et al. 2020).

The focus of research in the trauma field has primarily been acute management and how to reduce mortality of patients at the pre-hospital and acute phase. This medical research has improved patient care by providing a better understanding around fluid replacement, wound cleaning, infection control and nutrition support, with these improvements vital to enhancing patients' survival (National Institute of General Medical Sciences 2018).

From 2010 to 2019, the number of injury-related deaths decreased by 6.5%, but the years lived with disability increased by 19% globally (Global Health Metrics 2020). This trend is not surprising, as many steps have been taken to improve prevention measures and accessibility of acute care after injury in the past 20 years, with the addition of injury prevention campaigns, education to improve bystander intervention, improved emergency medical services (EMS), and triage of injured patients (Haagsma et al. 2016; Choi et al. 2021). Many of these improvements in patient care can be attributed to the introduction of trauma networks, as described in the next section.

### 1.6.1 Trauma Networks

The creation of trauma networks worldwide was prompted by the recognition that traumatic injuries require effective, collaborative care to improve mortality rates and patient outcomes (Lendrum and Lockey 2013; Moran et al. 2018; Alharbi et al. 2021). In 1976, the American College of Surgeons published guidelines for the creation of trauma systems and trauma centres, following improvements in the delivery of trauma care by the United States (US) military in the years prior (Lendrum and Lockey 2013). Since then, other guidelines have been published and updated with the aim of improving trauma care, including the *Guidelines for Essential Trauma Care* from the World Health

Organisation (WHO) and *Whitebook—Medical Care of the Severely Injured* from Germany (Mock et al. 2004; Siebert 2006). With increasing amounts of data from trauma registries, there is evidence that the development and maturation of trauma systems “leads to standardization of complex care, high level of education, [and] training and resources” (Chesser et al. 2019 p. 4).

#### *1.6.1.1 Definition*

A trauma network can be defined as a “collaboration between the providers commissioned to deliver trauma care services in a geographical area” (NICE 2016a p. 309). In the UK, a major trauma network (MTN) consists of a major trauma centre (MTC) and trauma units (TU) (see Table 3), as well as rehabilitation services (NICE 2016a).

After a trauma network is developed and launched, the effects of improved mortality can be observed within two years, due to regional protocols, collaboration between services, and consolidation of resources (Claridge et al. 2013). There is also evidence that trauma systems continue to ‘mature’ and observe a reduction in morbidity and mortality rates for the five to ten years following implementation, due to development and updating of protocols for triage and pre-hospital care, as well as improvements in organisation, expertise of staff, and resources (Nathens et al. 2000; Cameron et al. 2008; Lendrum and Lockey 2013). The World Health Organization published guidance on criteria for rating trauma systems’ maturity on a Maturity Index (see Figure 1), with Level IV indicating criteria for the most mature trauma systems (Mock et al. 2004; World Health Organization 2013). On the global scale, it is estimated that the implementation and improvement in trauma systems internationally would prevent approximately one third of all injury-related deaths (Mock et al. 2012).

**Table 3 – Trauma Network Definitions, from (NICE 2016a)**

Term	Definition, aspects
Major Trauma Network (MTN)	<ul style="list-style-type: none"> <li>- A collaboration between the providers commissioned to deliver trauma care services in a geographical area.</li> <li>- Includes all providers of trauma care: pre-hospital services, other hospitals receiving acute trauma admissions (Trauma Units), and rehabilitation services.</li> <li>- Links to the social care and the voluntary/community sector (NICE 2016a p. 309)</li> </ul>
Major Trauma Centre (MTC)	<ul style="list-style-type: none"> <li>- A specialist hospital responsible for the care of major trauma patients (i.e. most severely injured patients) across the region.</li> <li>- Provides 24/7 emergency access to consultant-delivered care for a wide range of specialist clinical services and expertise. (NICE 2016a p. 309)</li> </ul>
Trauma Unit (TU)	<ul style="list-style-type: none"> <li>- A hospital that is part of the major trauma network providing care for all except the most severe major trauma patients</li> <li>- Used for immediate treatment and stabilisation before being transferred on to the major trauma centre (NICE 2016a p. 318)</li> </ul>

	Level I	Level II	Level III	Level IV
<b>Pre-hospital trauma care</b>	No mapping of pre-hospital resources, no formal emergency medical services, lack of availability or duplication of pre-hospital services, no defined communication system.	Pre-hospital resources identifiable, no coordination between public and private providers of pre-hospital care, no universal access number, weak communication.	Formal emergency medical services, universal access number available, coordination among various agencies for pre-hospital care, well defined communication.	Formal emergency medical services controlled by a lead agency, national universal access number, legislative mechanism in place to govern emergency medical services and allow universal coverage.
<b>Education and training</b>	No identified health personnel to offer primary trauma care in the community.	Identified health personnel in the community for emergency trauma care, no definite training requirements for health workers or ambulance personnel.	Health professionals and paramedics trained in providing emergency trauma care, trauma training courses available.	Educational standards and training for emergency trauma care providers laid down, licensing and renewal norms for different levels of paramedics in place.
<b>Facility trauma care</b>	Role of secondary and tertiary facilities unclear, health facilities lack human and physical resources, no clear referral linkages.	Roles of various health care facilities clear, referral linkages present, no documentation or needs assessment of facilities as per <i>Guidelines for essential trauma care</i> , no lead agency in the system.	Health facilities in the systems are assessed as per <i>Guidelines for essential trauma care</i> <sup>a</sup> , and documented human and physical resources are available and ensured around the clock, lead agency present.	Mechanism for hospital verification and accreditation in place through ministry of health or professional bodies, lead agency with mandate to supervise trauma care.
<b>Quality assurance</b>	No injury surveillance or registry mechanism in place to obtain comprehensive data.	Injury data available, but no formal attempt to document or analyse them, no initiative for quality assurance.	Basic quality assurance programme as per <i>Guidelines for essential trauma care</i> <sup>a</sup> in place.	Formal quality assurance programme in place and mandated in pre-hospital and facility services.

**Figure 1 – World Health Organisation Trauma System Maturity Index, (World Health Organization 2013), used with permission ([CC BY-NC-SA 3.0 IGO](https://creativecommons.org/licenses/by-nc-sa/3.0/))**

### 1.6.1.2 International Trauma Networks

Established trauma networks can currently be found in many countries worldwide including North America, Australia, Europe, and more recently the United Kingdom.

As mentioned previously, the evolution of modern trauma networks started in the US in the 1970s with the American College of Surgeons guidelines for the creation of trauma systems (Lendrum and Lockey 2013). An initial regional trauma system in Orange County, California demonstrated that a systematic approach to trauma care resulted in a reduction in preventable deaths of the severely injured, demonstrating between a 15% and 25% reduction in mortality (Lendrum and Lockey 2013). Currently, US trauma care is delivered by regionalised trauma networks (Choi et al. 2021) and guided by the *Resources for Optimal Care of the Injured Patient* guidelines (American College of Surgeons 2022). Based on the WHO Maturity Index, the US trauma systems rank at a Level IV (i.e. most mature) across the four criteria displayed in Figure 1 (Dijkink et al. 2017).

Organised trauma systems were first introduced in Australia in 1990s, based on recommendations of a report from the *National Road Trauma Advisory Council* (NRTAC) that identified the framework for trauma system development (Delprado AM 2007). Australia has six states and two territories that each manage the public health system within the respective region, each including a governing body that oversees the trauma system in each state (Fischer et al. 2023). Currently, the Australian Trauma Registry (ATR) includes the Australian Trauma Quality Improvement Program (AusTQIP) that records pre-hospital and in-patient data from Level 1 Major Trauma Centres across Australia and New Zealand to ensure the provision of quality of trauma care (Fischer et al. 2023). In addition to the pre-hospital and in-patient patient outcomes, it has been acknowledged that data collection should also include long-term outcomes and quality of life of patients following traumatic injuries (Fischer et al. 2023). Australia's trauma systems were also rated as fully mature across all four criteria on the WHO Maturity Index (Dijkink et al. 2017).

Many European countries currently have trauma systems in place. A common, but unfortunate, theme in the development of trauma systems is that the catalyst for change arises from disasters (i.e. "Bijlmer Disaster" in Amsterdam, 1992) or reports of sub-optimal care (i.e. "Trauma: Who Cares?" in England, 2007) (Findlay et al. 2007; Chesser et al. 2019). As such, the varying timing of creation and the maturation of each country's trauma system has caused variation of processes and outcomes observed between systems. In a systematic overview of trauma systems worldwide, Dijkink et al. identified trauma systems in 14 different countries in Europe (Dijkink et al. 2017). Table 4 shows the European countries with trauma systems in place and the WHO classification for maturity of trauma systems (see Figure 1) (Dijkink et al. 2017). All countries scored either III or IV for *Pre-hospital care*,

indicating established and organised pre-hospital trauma care systems (Dijkink et al. 2017). There was a range of II/III to IV for *Facility-based trauma care* and *Education and training*, indicating a majority of the countries having fully comprehensive education and training of hospital staff within a formal, government-accredited trauma care system (i.e. IV), to some countries that lacked formal education for hospital staff and no formal hospital-based trauma system (i.e. II) (Dijkink et al. 2017). These countries also ranged in the presence of a trauma registry for *Quality assurance*, with most countries having basic or formal quality assurance programs.

**Table 4 - European Trauma System Maturity**, adapted from (Dijkink et al. 2017 pp. 921–922)

<b>European Country</b>	<b>Pre-hospital trauma care</b>	<b>Facility-based trauma care</b>	<b>Education &amp; training</b>	<b>Quality assurance</b>
<i>Belgium</i>	IV	III	IV	N/A
<i>Croatia</i>	III	III	II/III	III
<i>Finland</i>	IV	III	III	III
<i>France</i>	IV	III	III	III
<i>Germany</i>	IV	IV	IV	IV
<i>Greece</i>	III	II/III	II/III	II
<i>Italy</i>	IV	III	IV	III
<i>Ireland</i>	III	III	N/A	IV
<i>Norway</i>	IV	III	IV	III
<i>The Netherlands</i>	IV	IV	IV	IV
<i>Scotland</i>	III	II/III	III	IV
<i>Spain</i>	IV	III	III	II
<i>Sweden</i>	IV	III	IV	III
<i>UK</i>	IV	IV	IV	IV

*Criteria ranked based on World Health Organisation Maturity Index (see Figure 1)*

*Abbreviation: Not answered (N/A)*

### 1.6.1.3 Trauma Networks in England

In the UK, there were calls for centralisation of trauma care as early as 1959, but the modern trauma care reform did not begin until the 2007 report boldly titled “Trauma: Who Cares?” highlighted the then-relevant organisational shortcomings of acute care delivery in England, estimating that 60% of major trauma patients were receiving “a standard of care that was less than good practice” (Findlay et al. 2007 p. 10; Copas and Moran 2014). This prompted the National Audit Office to publish the 2010 report *Major Trauma Care in England* to recommend the implementation of trauma networks to improve the organisation and quality of care (National Audit Office 2010).

The London Trauma System was launched in 2010, followed soon after with the launching of 18 bespoke regional trauma networks and 26 major trauma centres spread across England in 2012 (Copas and Moran 2014). A three-tier system was introduced, with patients triaged and transported to either a MTC, TU, or local emergency hospital (see Table 3) depending on their medical needs (Chesser et al. 2019). Since the introduction of the regional trauma networks, survival for patients with severe trauma increased by 20% in England, demonstrating the benefits of coordinated services (NHS England 2013; Copas and Moran 2014). From 2008 to 2017, there were approximately 248,000 cases of moderate and major trauma, with over 227,000 trauma survivors (Moran et al. 2018). These improvements in pre-hospital and acute trauma care have proved to be instrumental for saving peoples' lives, but that is only the beginning of the journey for patients following a traumatic injury.

## 1.6.2 Guideline for Trauma Care in the UK

### *1.6.2.1 World Health Organization Guidelines*

The World Health Organization published the *Guidelines for Essential Trauma Care* in 2004 with the aim of promoting low-cost improvements in trauma care worldwide through the *Essential Trauma Care Project* (Mock et al. 2004). The primary audience for this guidance was the administrative level staff in charge of planning of trauma care services and includes the standards of trauma care that address the needs of injured patients and the resources necessary to deliver that care (e.g. human and physical resources) (Mock et al. 2004).

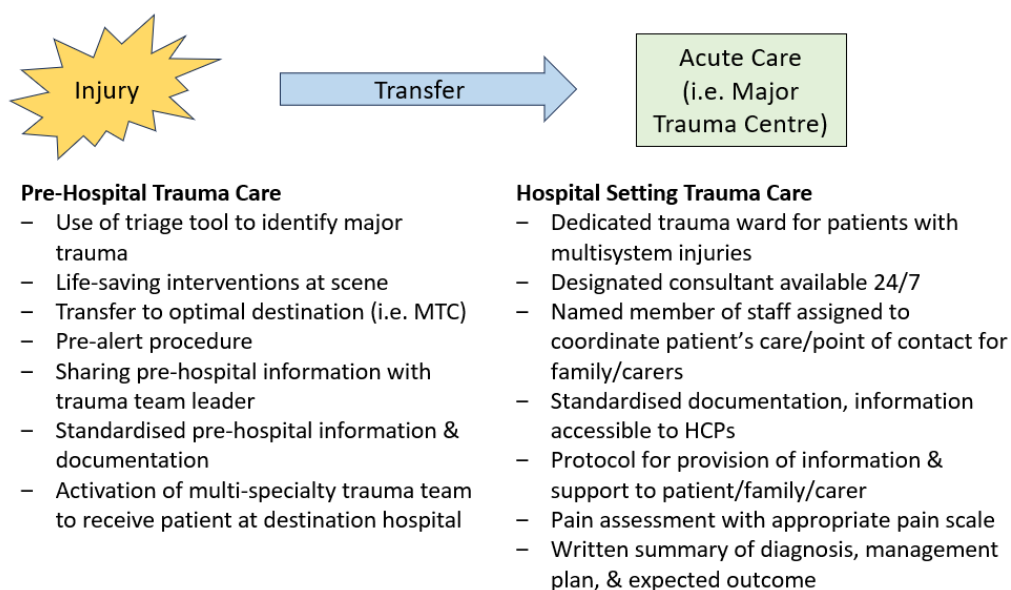
While this guidance mainly focuses on standards related to trauma care provision and acute care, it includes a small section on rehabilitation, highlighting the importance of rehabilitation in “maximising recovery of independent function” (Mock et al. 2004 p. 45). The essential rehabilitation services identified included physiotherapy, occupational therapy, prosthetic services, psychological counselling, neuropsychology, and speech and language therapy (Mock et al. 2004). For patients that do not regain their prior functional abilities, a community-based rehabilitation approach is recommended with collaboration between healthcare and local services. This guidance does not elaborate further on the specifics of community rehabilitation, but advises HCPs are able to signpost patients to local services following discharge (Mock et al. 2004).

### *1.6.2.2 National Institute for Health and Care Excellence Guidelines*

The National Institute for Health and Care Excellence (NICE) has published multiple guidelines for the care and rehabilitation of adults following traumatic injuries.

*Major trauma: service delivery* was published in 2016 and provides guidance on the organisation of delivering major trauma services to severely injured individuals, focused on the pre-hospital and acute settings (NICE 2016b). This guidance also provides recommendations for trauma systems on quality assurance practices (i.e. monitoring and audit), education and training, and documentation practices. *Major trauma: assessment and initial management* was also published in 2016 and provides specific recommendations for pre-hospital and acute care for patients with major trauma (NICE 2016a). This includes topics such as airway management, management of specific injury types (i.e. chest trauma, haemorrhage), and pain management (NICE 2016a). There are also recommendations for HCPs on documentation, how to support patients and family/carers, and relevant training and skills.

Figure 2 shows some of the different aspects and considerations of initial management indicated by NICE guidelines (NICE 2016b, 2016a). In Section 1.7.3.2, these recommendations are illustrated with an example of the current patient pathway in the North of Scotland.



**Figure 2 – NICE Guidance for Initial Management of Patients with Major Trauma, (NICE 2016b, 2016a)**

NICE also published *Trauma: Quality standard* for the trauma care (NICE 2018). This document contains six quality statements, with the first four providing guidance for care of specific injuries related to major trauma, and the last two addressing major trauma centre service provision. It is recommended that “[m]ajor trauma centres have a dedicated trauma ward for patients with multisystem injuries and a designated consultant available to contact 24 hours a day, 7 days a week”



(NICE 2018 p. 24). This is because major trauma patients often require input from more than one specialist and having a designated consultant aims to improve coordination and continuity of care for these patients (NICE 2018). It is also recommended that “[m]ajor trauma centres have acute specialist services for rehabilitation after major trauma, and for children and older people” (NICE 2018 p. 28). Alongside specialist medical input, patients with major trauma often need input from specialist rehabilitation services and these should be available at MTCs, which aim to “reduce length of hospital stay, lower mortality, and improve patient experience” (NICE 2018 p. 28)).

The above guidelines focus mainly on standards for service delivery and practical recommendations for pre-hospital and acute care of patients with traumatic injuries. Both of these aspects are important to the ultimate goal of providing optimal care for the severely injured, as this requires that all the local services are coordinated to provide efficient and timely care (NICE 2016b, 2016a, 2018).

Most recently, NICE published guidelines on *Rehabilitation after traumatic injury*, which includes detailed recommendations for complex rehabilitation needs of adults following traumatic injuries (NICE 2022). Table 5 highlights the recommendations for rehabilitation provision at each phase of care covered in these guidelines (i.e. acute setting, discharge from acute care, and post-discharge). These guidelines are novel in that they cover the post-discharge aspect of rehabilitation, which had not been covered in other prior guidelines for people with traumatic injuries. After leaving the acute care setting, people with traumatic injuries should be supported through a multidisciplinary approach to participate in education, work, and their community. This includes the provision of emotional and psychological support, access to rehabilitation services needed for participation in the community, and creating realistic rehabilitation goals for daily life and work-related activities (NICE 2022). While these guidelines offer rehabilitation recommendations, it is still up to individual trauma networks to adopt them into practice.

#### *1.6.2.1 British Society of Rehabilitation Medicine Guidance*

The importance of rehabilitation following traumatic injuries is also recognised in the British Society of Rehabilitation Medicine (BSRM) guidance: *Specialist Rehabilitation in the Trauma Pathway: BSRM Core Standards* (Turner-Stokes 2018). This document acknowledges the importance of early rehabilitation interventions and the role of specialist rehabilitation trauma care (Turner-Stokes 2018). This is because a significant number of patients require rehabilitation input from a multidisciplinary team (MDT) following a traumatic injury and portion of those patients will need extended specialist rehabilitation input (Turner-Stokes 2018).

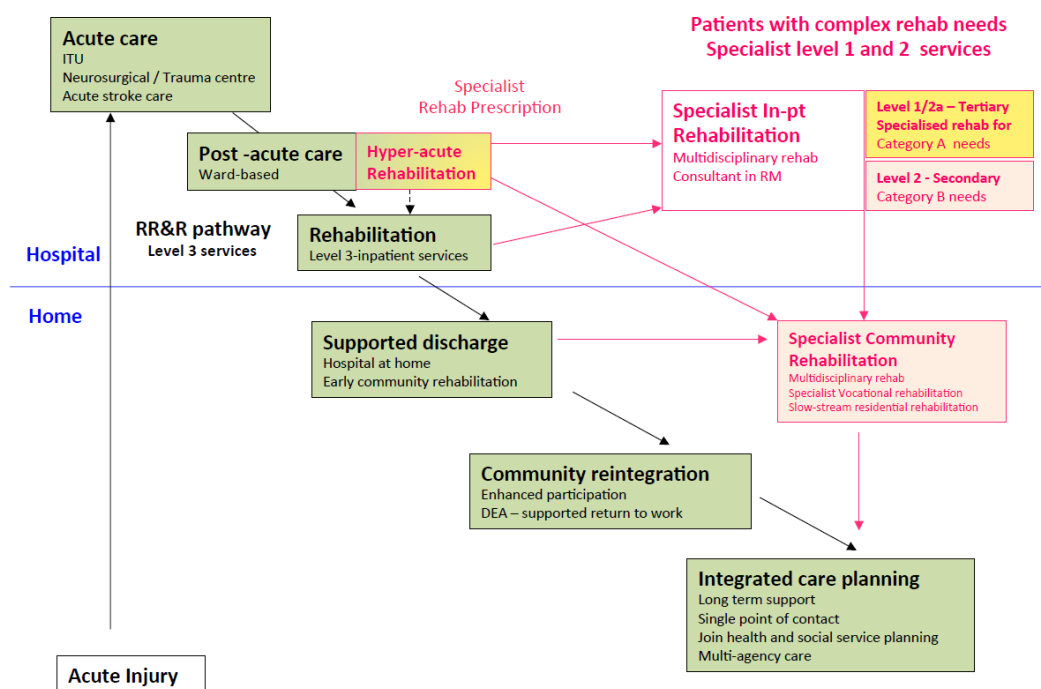
**Table 5 – NICE Rehabilitation Recommendations, adapted from (NICE 2022)**

<b>Phase of Care</b>	<b>NICE Recommendations</b>
<i>Assessment, goal setting, and creating rehabilitation plan</i>	<ul style="list-style-type: none"> <li>- Early assessment and intervention</li> <li>- Initial assessment by multidisciplinary team, including physical, cognitive, and psychological functioning</li> <li>- Set short-term and long-term rehabilitation goals with patient and family/carers</li> <li>- Develop tailored rehabilitation plan including initial assessment and goals to share with patient and care team</li> </ul>
<i>Acute Care</i>	<ul style="list-style-type: none"> <li>- Created from rehabilitation plan and includes relevant rehabilitation therapy (e.g. physical, psychological, and cognitive), including injury-specific therapies</li> <li>- Monitor progress using PROMs, encourage patient to record aspects of their recovery (injuries, treatments, therapies)</li> <li>- Named rehabilitation coordinator</li> </ul>
<i>At discharge from acute care</i>	<ul style="list-style-type: none"> <li>- Early, multidisciplinary discharge planning, including family/carers</li> <li>- Re-assess rehabilitation needs and update rehabilitation plan</li> <li>- Liaise with community teams and offer multidisciplinary approach for rehabilitation and social care needs</li> <li>- Single point of contact for patient and family/carers</li> </ul>
<i>Post-discharge</i>	<ul style="list-style-type: none"> <li>- Consider intensive rehabilitation programmes (inpatient or outpatient) for functional goals, when appropriate</li> <li>- Guided self-managed rehabilitation – provide patient with tailored educational material for relevant to injury, symptoms, and recovery</li> <li>- Support access to services needed for participation in community</li> </ul>

Abbreviation: patient reported outcome measure (PROM)

This document provides guidance for rehabilitation in an inpatient setting and details an ideal patient pathway (i.e. Recovery, Re-enablement and Rehabilitation (RR&R) pathway) (Figure 3) (Turner-Stokes 2018 p. 4). It is expected that most patients with traumatic injuries will follow the set out the RR&R pathway, shown in by the green boxes in Figure 3. Patients that require specialist rehabilitation follow the pathway outlined by the pink boxes on the right side of the figure. This guidance advised that all patients with an ISS  $\geq 9$  (i.e. moderate to major trauma) have an assessment for rehabilitation needs and all identified rehabilitation needs are documented with the creation of a 'Rehabilitation Prescription'. This Rehabilitation Prescription is used to determine the patient pathway most appropriate for the patient (e.g. green RR&R pathway or involvement of specialist rehabilitation).

This guidance details the pathway for acute and specialist rehabilitation for patients with major trauma, but it does not provide guidance for rehabilitation after discharge from the acute care setting, except to recommend that Rehabilitation Prescriptions are updated when the patient is discharged from an MTC (Turner-Stokes 2018).



**Figure 3 – Recovery, Re-enablement and Rehabilitation Pathway for Patients with Trauma,** (Turner-Stokes 2018 p. 5), used with permission

### 1.6.3 Focus on Rehabilitation for Traumatic Injuries

Similar to early trauma system guidelines from other countries, initial guidelines for UK trauma systems and care were mainly aimed at recommendations for pre-hospital and acute care, as it is recognised that receiving definitive care quickly is important for those with moderate to severe injuries, sometimes referred to as the “golden hour” following the event (Abhilash and Sivanandan 2020; Okada et al. 2020). This was also because mortality was the main metric that was measured for care of patients with traumatic injuries (Salim et al. 2023).

With global trends indicating an ever-increasing burden from injury-related disabilities, it is essential that healthcare services continue to adapt and prepare to support this growing population of patients, as it is known that people recovering from traumatic injuries often have complex health and

rehabilitation needs (Ekegren et al. 2020; Vos et al. 2020). In the past decade, a shift to acknowledging the role of rehabilitation in the trauma care pathway, with guidelines published by NICE and BSRM as well as a number of recent rehabilitation initiatives and campaigns including the *Right to Rehab* campaign, England's *Improving Rehabilitation Services*, and the *Once for Scotland* rehabilitation framework (Health and Social Care Alliance Scotland 2021; NHS England 2021; Scottish Government 2022a).

The *Right to Rehab* campaign was created to start the conversation about healthcare reform in Scotland with the aim that every person receives appropriate and timely rehabilitation to improve quality of life and health outcomes (Health and Social Care Alliance Scotland n.d.). The *Right to Rehab* coalition is composed of 24 charities, trade unions, and professional bodies that are pushing for improved rehabilitation opportunities for all (Right to Rehab Coalition 2020). The coalition proposes these changes would be best accomplished by investing in the local workforce in Scotland and incorporating the ideas of *Right to Rehab* into the national Health and Social Care Strategy (Health and Social Care Alliance Scotland n.d.). By addressing multiple levels of healthcare from individual patients and local service needs all the way up to changing national policies, the *Right to Rehab* campaign is pushing for improvement in rehabilitation accessibility across the country.

The *Right to Rehab* campaign follows on from a programme from NHS England called *Improving Rehabilitation Services*, which highlights the role of Allied Health Professionals (AHPs) in rehabilitation reform. NHS England published two documents titled “Principles and Expectations for Good Adult Rehabilitation” (Hughes 2015) and “Rehabilitation Commissioning Guidance” (NHS England 2016) to provide guidance of optimal rehabilitation standards for commissioners, health care providers, and service users. The aim of *Improving Rehabilitation Services* was to “[help] people remain as independent as possible, continuing to live their lives and wherever possible, returning to work and occupation” (NHS England 2021). While these guidance documents are general, they do define rehabilitation principles and set the standard of care that patients should be able to expect from rehabilitation services.

Recently, the Scottish Government released a framework for provision of rehabilitation services in Scotland: *Rehabilitation and Recovery: A Once for Scotland Person-Centred Approach to Rehabilitation in a Post-COVID Era* (Scottish Government 2022a). The aim of this framework was:

*“By the end of 2025 all adults who require rehabilitation will have timely access to the right information and services in the right place to support them to participate as actively as possible and enjoy the life they choose.” (Scottish Government*

*2022a p. 6)*

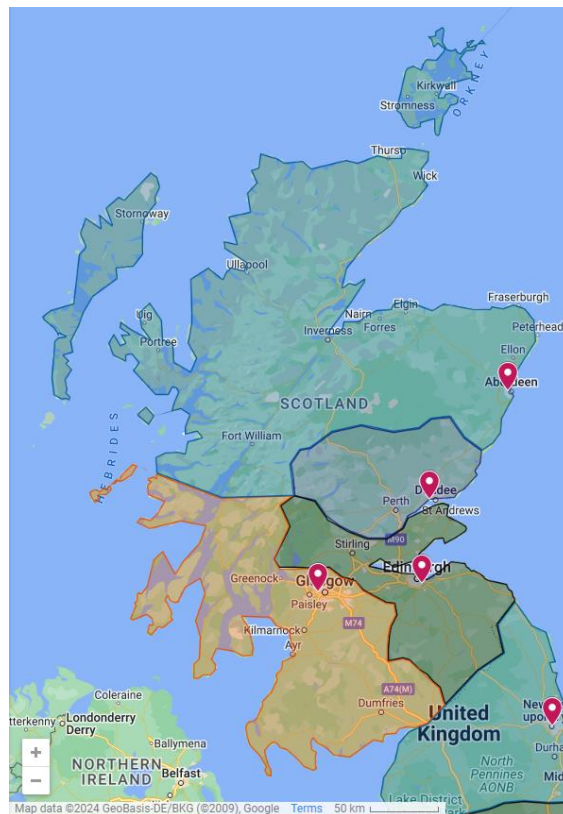
This framework aims to deliver person-centred care by supporting shared decision-making and includes six principles for rehabilitation: “1) Easy to access for every individual, 2) Provided at the right time, 3) Realistic and meaningful to the individual, 4) Integrated, 5) Innovative and ambitious, 6) Delivered by a flexible and skilled workforce” (Scottish Government 2022a p. 9). This commitment to improving rehabilitation services for all in Scotland was identified following the challenges facing healthcare services following the Covid 19 pandemic, acknowledging the importance of rehabilitation services as an integral part of the national healthcare service (Scottish Government 2022a).

Rehabilitation of traumatic injuries is vital due to the socioeconomic burden that these injuries pose. From the BSRM specialist rehabilitation guidance, an audit of specialist rehabilitation following major traumatic injuries in England in 2015 found that while specialist rehabilitation was costly (i.e. mean episode cost £40,000), when compared with the potential savings of £28,000 per year on care, this averaged to a lifetime saving of over £500,000 per patient (Turner-Stokes 2018). Aside from direct healthcare costs, there is also economic losses when individuals are delayed or are not able to return to work following an injury, where the ill health of working age individuals is estimated to cost the UK economy £100 billion a year, due to “sickness absence, lost productivity through worklessness, informal care giving, and health-related productivity losses” (Department for Work & Pensions and Department of Health 2016 p. 15). These costs are in addition to the personal impact injuries have on individuals, with evidence of reduced health-related quality of life in the months to years post-injury (David et al. 2022). Due to the high personal and economic costs of traumatic injuries, the importance and impact of rehabilitation is significant.

## **1.7 Scottish Trauma Network**

### **1.7.1 Background**

Following on from the implementation of trauma networks in England, the Major Trauma Oversight Group for Scotland was created in 2012 to evaluate and improve trauma care delivery in Scotland (Scottish Trauma Network 2018a). The result was the creation of the Scottish Trauma Network (STN), which was established in 2017 with a phased five-year implementation plan (Scottish Trauma Network 2018a). The STN consists of four regional trauma networks (i.e. North, East, South-East, West) (see Figure 4), each with a MTC and a number of smaller TUs to deliver coordinated trauma care across Scotland (Scottish Trauma Network 2018a).



**Figure 4 - Map of Regional Trauma Networks in Scotland, (Midlands Critical Care & Trauma Networks 2024), used under principles of fair use (Google 2024)**

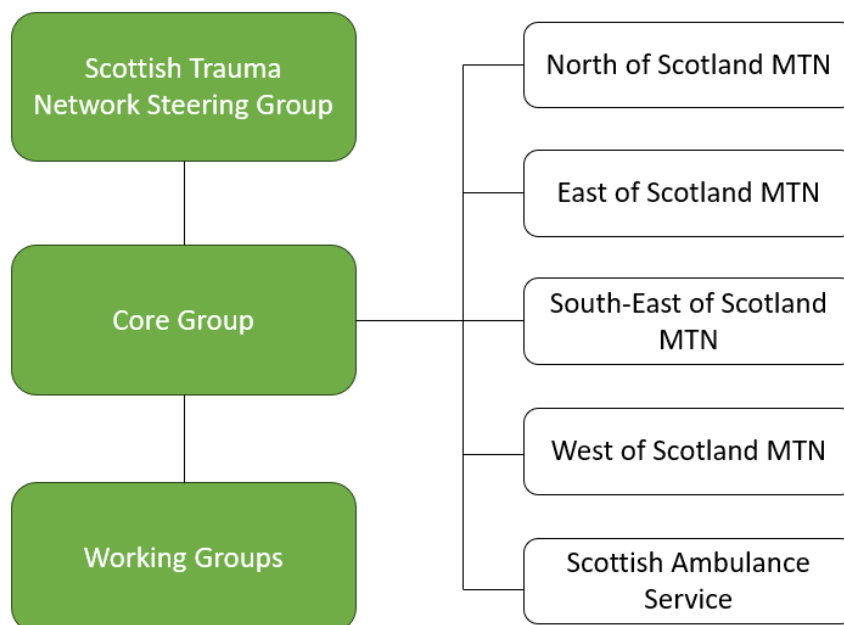
The mission of the STN is:

*To improve and optimise the health and wellbeing of the seriously injured. Helping them, their families, each other and our nation. Pioneering clinical excellence, health intelligence, innovation, education and research. (Scottish Trauma Network 2018b p. 3).*

This mission is reflected in the STN’s aim of “Saving lives and Giving life back”, acknowledging the importance of trauma care to extend from injury prevention through to rehabilitation (Scottish Trauma Network 2018b p. 3).

The STN is governed by the *STN Steering Group*, which oversees the *Core Group*, consisting of the leaders of each of the four regional networks and Scottish Ambulance Service (SAS) (see Figure 5). The STN also works in collaboration with the Scottish Trauma Audit Group (STAG) and multiple working groups that provide guidance on different aspects related to the provision of trauma care

(e.g. prevention, pre-hospital, acute, rehabilitation, education and workforce, and clinical governance) (McKechnie et al. 2023).



**Figure 5 – Scottish Trauma Network Governance**, adapted from (McKechnie et al. 2023)

The aims for the initial development phase of the STN were to develop the STN model and *STN Steering Group*, set up the pre-hospital components of the network, including trauma equipment and training for ambulance and hospital staff, and work with STAG to set Key Performance Indicators (KPIs) to use for quality assurance (Calderwood 2017). All four of the MTCs were launched, as of August 2022, and the STN is continuing to improve on elements of the network with an aim of focusing on “future sustainability” (McKechnie et al. 2023). Some aims for the current phase of the network include an audit of major trauma triage tools, developing a *Trauma Data Platform*, and reviewing the *Rehabilitation Plan* templates used for patients with rehabilitation needs (McKechnie et al. 2023).

#### 1.7.1.1 Scottish Trauma Audit Group

The Scottish Trauma Audit Group is an integral part of the STN and is involved with quality assurance, with the aim to: “improve the clinical care, rehabilitation, overall experience and long term outcome

of patients with serious injury through measuring compliance against the National Standards and supporting a quality improvement process” (Public Health Scotland 2021a).

Each regional network has local STAG audit coordinators that are responsible for identifying eligible patients and the data entry for their local sites (Public Health Scotland 2022). The inclusion criteria for patients to be eligible to be recorded in STAG is; 1) all trauma patients presenting with injuries sustained within the past week, and 2) who are admitted to Critical Care, stay in hospital for three days or more, or die in hospital, and 3) who do not meet the listed exclusion criteria (i.e. isolated injuries, pathological fractures) (Public Health Scotland 2020b).

The Scottish Trauma Audit Group also maintains data on KPIs, which are used for audit purposes to identify if optimal care is being provided or if there are areas that local services can review to learn and improve services (Public Health Scotland 2022). Most KPIs relate mainly to pre-hospital and acute care, such as “KPI 2.4.5: Time to CT for patients with Glasgow Coma Score (GCS) 13-14” or “KPI 2.5: Patients who have suffered a severe head injury are managed in a MTC” (Public Health Scotland 2023). There are three KPIs that relate to rehabilitation: “KPI 3.1.1: Major trauma patients admitted to a MTC have a rehabilitation plan”, “KPI 3.1.2: Major trauma patients who have a rehabilitation plan, have it written within 3 days”, and “KPI 3.2: Patients who have survived major trauma have their functional outcomes assessed at specific timelines using patient reported outcome measures (PROMs)”, with only the last KPI subject to governance by the Scottish National Audit Programme (SNAP) (Public Health Scotland 2023).

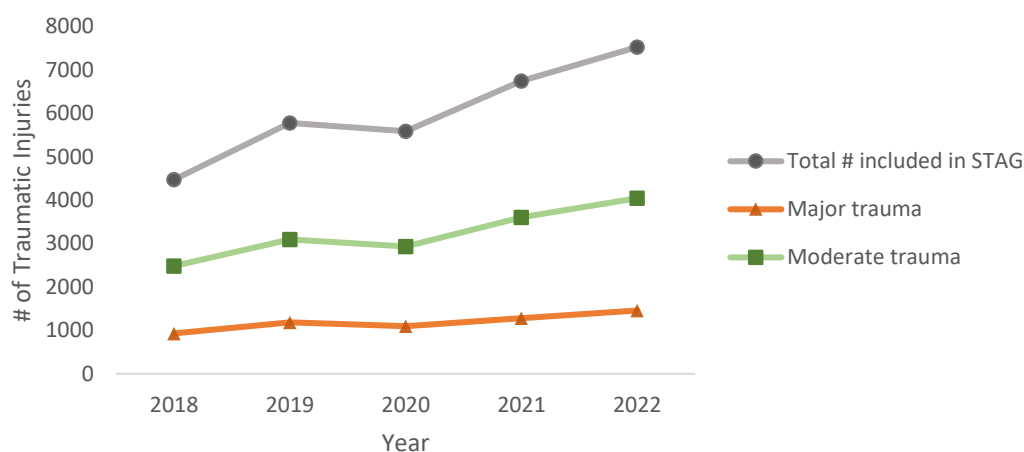
For the last KPI relating to functional outcomes, STAG oversees the administration and reporting of PROMs using the EQ-5D outcome measure, which is a validated outcome measure that evaluates health-related quality of life (Devlin, Parkin and Janssen 2020a). The EQ-5D is administered at three time points (i.e. before hospital discharge, six months, and one year post-injury) (Dodds and Khan 2020). PROMs are reported annually by STAG and are discussed further in Section 1.8.1.

### 1.7.2 Prevalence of Traumatic Injuries in Scotland

In the 2021/2022 year, there were approximately 390,000 emergency admissions to hospitals across Scotland. Of this number, only a small percentage of these unplanned emergencies were eligible and received input from the STN. In 2022, STAG reported a total of 7,531 patients admitted to hospital with traumatic injuries in Scotland, with 5,504 (73%) of these patients having moderate to major traumatic injuries (see Figure 6) (Public Health Scotland 2023).



Since the introduction of the Scottish Trauma Network in 2017, there has been an increase in the total number of patients with traumatic injuries recorded, but this could be from increased reporting due to the launch of the last two MTCs in 2021 and 2022. While the total number of patients with traumatic injuries reported in STAG is increasing, the proportion of types of injury severity (i.e. minor, moderate, major) are comparable since 2018 (Public Health Scotland 2023).



**Figure 6 - Prevalence of Traumatic Injuries in Scotland**, adapted from (Public Health Scotland 2023)

### 1.7.3 North of Scotland Major Trauma Network

#### 1.7.3.1 Background

The North of Scotland Major Trauma Network (NoS MTN) was launched in October 2018 and spans across five National Health Service (NHS) Health Boards, including NHS Grampian, NHS Highland, NHS Orkney, NHS Shetland, and NHS Western Isles, covering an area equalling 60% of Scotland's landmass (McKechnie, Burley and Gilhooly 2021; Scottish Trauma Network 2021). To add to the geographical challenge, 40% of the population in this area live in remote and rural areas, which requires effective organisation and communication between hospitals and the Scottish Ambulance Service to provide efficient, high-quality trauma care (McKechnie, Burley and Gilhooly 2021).

The North of Scotland Major Trauma Centre (NoS MTC) was launched in Aberdeen Royal Infirmary (ARI) in October 2018. The NoS MTC is not a physical ward within the hospital, instead it is a model of care used to provide optimal care to patients that have experienced major and moderate traumatic injuries. The importance of the MTC is that many patients with moderate and major trauma have

multiple injuries requiring care from different specialties; the MTC approach aims to ensure that patient's receive coordinated care for optimal outcomes. An example of a general patient pathway through the NoS MTC is described in the next section (Section 1.7.3.2).

The NoS MTC is a consultant-led, dedicated multidisciplinary team (MDT) that includes trauma coordinators, trauma and rehabilitation consultants, physiotherapists, occupational therapists, speech and language therapists, dietitians, and neuropsychologists. The MTC MDT holds weekly meetings, regularly reviews patients on ward rounds, and conducts regular development meetings. The MTC also has access to other resources and services within the hospital including orthotics and surgical appliances (via orthotists and prosthetists), assistive technology, communication aids, seating and wheelchair services, and vocational rehabilitation specialist.

The MTC team involvement in patient care starts when the patient is admitted to hospital, and continues throughout acute care and maintains continuity of care during the transition home with follow up calls and offering follow up clinics after the patient is discharged from hospital. The MTC also has links with the community psychology team, offering follow up at multiple timepoints and contact information for patients to opt-in to services. Other services which may be required for the rehabilitation and care for patients who have suffered severe injuries are specialist nursing teams (i.e. management of external fixators, stoma care), pharmacy, pain management, audiology, optometry, and podiatry.

### *1.7.3.2 Patient Pathway*

While each patient's pathway and care will be determined by their presenting condition and care needs, this section aims to describe the general patient pathway through the NoS MTN following a traumatic injury.

When a person sustains a traumatic injury in the North of Scotland, the trauma pathway starts with the call to an emergency dispatcher via 999. The patient is triaged by the emergency dispatcher to determine transportation requirement and destination, with patients with severe injuries routed to the NoS MTC. Emergency dispatchers are also responsible for alerting the hospital team. The patient is transported to ARI via ambulance, air transport, or self-presentation. Patients can also be transferred to ARI from other local hospital emergency rooms or trauma units within the North of Scotland region to receive specialist care if the injury is not immediately identified a major trauma, or if the patient requires life-saving intervention and is transported to a trauma unit initially. Patients with major trauma are often admitted into intensive care unit (ICU) and then are transferred to an

appropriate ward, typically the high dependency unit (HDU) or a specialist ward. Patients' primary speciality is identified depending on their main injuries (i.e. orthopaedics, neurosurgery, cardiothoracic).

Trauma coordinators identify admitted patients that would benefit from input from the MTC pathway. Although there is not a specific criterion for inclusion at the time of admission, as ISS typically has not been calculated, several criteria for MTC input include: the presence of high energy mechanism of injury (e.g. RTA, falls), injuries to more than one body region and/or treated under more than one specialty, suspected psychological needs (i.e. fatality at scene of injury), presence of head injuries, flail segment rib fractures, or bilateral lower limb injuries, and consideration to the patient's past medical history and age (Coutts, A., personal communication by conversation. 18 May 2022). The identified patients are then assessed by trauma coordinators and a trauma consultant, if required, to confirm if they require input from the MTC. If the patient requires MTC input, then a "Rehabilitation Plan" is filled out within 3 days (KPI 3.1.2) and they are included in the trauma care pathway, which means they are seen and reviewed regularly by the MTC team in addition to the input from their primary specialty team. If MTC input is not required, then this is documented by the trauma coordinators and the individual is not included in the trauma pathway.

The MTC team is then be involved in the patient's care throughout their time in hospital. This includes specific management of all injuries sustained, pain team involvement, and family liaison. Trauma coordinators are the direct point of contact for the patient and family/carers throughout the patients' time in acute care and post-discharge from hospital. The role of the trauma coordinator is to liaise with the MDT to facilitate timely care to the patient and family based on individuals' needs (McKechnie, Burley and Gilhooly 2021). The MTC team is also involved with discharge planning, with discharge location and planning started once there are indications of what the patient's care and rehabilitation needs (i.e. specialist rehabilitation, transfer to trauma unit or local hospital, directly home).

At hospital discharge, data such as patient reported outcome measures (PROMs) and patient experience questionnaires are collected for STAG. Two to four weeks after leaving hospital, the trauma coordinators follow up with the patient via telephone call (McKechnie, Burley and Gilhooly 2021). Patients are offered an optional three-month clinic review with MTC staff to discuss any ongoing issues they may be experiencing. Patients also receive a posted invitation for follow up from the neuropsychology team at six-months after discharge from hospital and again at one year after discharge. In addition to these follow ups, patients are given the contact number for the trauma coordinators to contact at any time in the future for any traumatic injury-related questions or follow

up. The MTC also signposts patients to relevant third-sector organisations (e.g. Headway, AfterTrauma, local charities) and information, depending on injuries sustained and the needs of patient.

After patients are discharged from the MTC, referrals are sent out for patients to access relevant rehabilitation services. For those that are discharged directly home, typically community or outpatient rehabilitation services accessed. Others that require further specialist rehabilitation input may be discharged to inpatient rehabilitation units (e.g. Orthopaedic Rehabilitation Unit, Neurological Rehabilitation Unit) where they receive ongoing intensive rehabilitation input.

## **1.8 Scope of Thesis**

### **1.8.1 Area of Interest**

During a patient's journey through the acute care setting, the NoS MTC clinicians and other HCPs are closely involved in patient care and are able to identify the patient's needs through regular patient contact. Once the patient is discharged from hospital, less is known about the patient's needs and experiences, as the MTC team has less contact and the patient may access care through multiple services (e.g. general practitioner (GP), community care teams, private services). In 2020, an unpublished audit was conducted by NoS MTC clinicians, identifying that 55% of patients with major trauma had ongoing rehabilitation needs at time of discharge from the NoS MTC and that 67% were discharged straight home from the NoS MTC (Stables 2021). These findings highlighted the need for research to explore the outcomes and experiences of adults with major and moderate traumatic injuries in the North of Scotland after leaving the NoS MTC.

It has previously been identified that traumatic injuries can have a significant impact on individuals' short-term and long-term health outcomes due to the healing process of multiple injuries and psychological factors (Slaney et al. 2014; Ekegren et al. 2018; Silverstein, Higgins and Henderson 2021). Recent literature on rehabilitation and recovery experiences of patients with traumatic injuries following discharge from hospital in the UK indicate that some patients may experience challenges when accessing rehabilitation services and rely on additional rehabilitation interventions (Kettlewell et al. 2021; Silvester, Trompeter and Hing 2021).

Currently, STAG uses patient reported outcome measures (PROMs) to measure health-related quality of life (HRQoL) as a way to track the second part of the STN aim: 'Giving life back'. PROMs are tools that are used to measure patient reported outcomes, such as functional status, health-related quality of life, symptoms, and health-related behaviours and are widely used throughout healthcare

as a way to incorporate patient decisions into health interventions and services (Weldring and Smith 2013). The limitation with only using PROMs to measure outcomes is that they are snapshots of patients' perspectives at one time-point and they do not capture possibly important aspects about a patient's experiences or reasons for answering the way they did (Neale and Strang 2015).

In the latest annual audit for 2022, STAG reported PROMs for the prevalence of patients reporting moderate to extreme problems with issues such as mobility, pain/discomfort, anxiety/depression, and usual activities at six months post-injury (36.8%, 45.6%, 33.7%, and 45.6%, respectively) (Public Health Scotland 2023). While the prevalence of issues regarding patients' health status is useful to know, to be able to identify what can be done to improve the services can require further research.

When developing this thesis, the researcher consulted the NoS MTN clinicians to identify the most important questions, from their clinical perspective. The topics of interest included return to work, levels of function/dysfunction, recovery experiences, ongoing rehabilitation needs, return to activities and hobbies, and health-related quality of life measures (Gall, A., Stables, L., & Burnett, J., personal communication by conversation. 29 April 2021). After conducting a preliminary search in the STN webpage and in published trauma care literature, the need for further information on recovery experiences of adults following traumatic injuries in Scotland was confirmed by the researcher.

The NoS MTN is still developing and to date, there has not been any research on patient experiences following discharge from hospital in the traumatic injury patient population and this was identified as an area that required further research. This led to a search of the literature in the form of a qualitative systematic review on recovery experiences of adults with traumatic injuries (see Chapter 2), which then informed the primary research study, with the aim to broaden what is known about the recovery experiences of the traumatic injury population in the context of the North of Scotland.

### 1.8.2 North of Scotland

The North of Scotland has unique characteristics in that the area covered by the NoS MTN represents a large portion of Scotland's landmass, but is home to only 16% of Scotland's total population (McKechnie, Burley and Gilhooly 2021). While the relative population is small, 40% of this population live in remote and rural areas (McKechnie, Burley and Gilhooly 2021). Previous research on the rehabilitation experiences of patients with traumatic injuries living in rural areas of Australia identified a number of barriers to accessing rehabilitation (Kingston, Judd and Gray 2015; Sharp et al.

2023), identifying a need to explore the experiences of those living in the North of Scotland to be able to identify unique experiences or unmet needs.

The NoS MTN was the first regional trauma network of the STN to be launched in 2018, so the NoS MTN was the most developed MTN in Scotland at the start of this thesis. The NoS MTN also had the largest patient database to recruit participants from, with the added benefit of being able to recruit patients several years after their injury to explore longer-term recovery and rehabilitation experiences. To the researcher's knowledge, there is no prior research on the recovery and rehabilitation experiences of adults with traumatic injuries in Scotland.

### **1.9 Definition of Terms**

Throughout this thesis, there are terms that will be used and as some terms have different meanings in different settings, the way they will be used in this work are defined here.

Rehabilitation is defined as “interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment” (World Health Organization 2021 p. 1). Rehabilitation can also refer to “the process that [healthcare] practitioners use to facilitate recovery” (Farkas 1996). In clinical practice and in research, the term rehabilitation is thought of as the provision of “activities, interventions and information resources that support individuals to recover or adjust to achieve their full potential” (Scottish Government 2022a p. 7), often with aims to be measurable with outcome measures. In this thesis, rehabilitation will be defined using the last definition, as the provision of activities and interventions is what is known and experienced by the individuals involved in rehabilitation and what they are able to provide insight on.

Recovery can be defined as “the lived or real life experience of persons as they accept and overcome the challenge of a disability” and is a complex process (Deegan 1988 p. 1). This thesis involves both the concepts of rehabilitation and recovery and after discussions with the supervisory team and wider clinical team, the researcher decided that term “recovery” fit the aims of the research better than rehabilitation experiences, as the rehabilitation process is only one aspect of individuals experiences following an injury.

The term “patient journey” or “recovery journey” are used throughout this thesis, referring to the time after the event that caused the traumatic injury. A study by Richmond et al. used the term journey to describe the time and experiences of participants following traumatic injuries: “Recovery, therefore, was not an end point or destination, but a journey in itself” (Richmond et al. 2000 p. 1346). Using the term “journey” becoming more commonly used in healthcare research, with the

introduction of “journey mapping” as a novel qualitative approach (Ly, Runacres and Poon 2021) and the longstanding “patient journey” article series in the British Medical Journal (BMJ) (Lapsley and Groves 2004). While it is commonly used, the researcher acknowledges that some people, especially patients, may prefer other terms as “patient experience”, as “patient journey” can be perceived as generic and depersonalised (Richards 2017). This view is acknowledged, but the term journey will be used throughout as it is a widely-acknowledged term used in healthcare research and all efforts to avoid generalising participants’ experiences will be made.

The term “health care professional” or abbreviation ‘HCP’ is used throughout this work and refers to all professional caregivers employed in healthcare, including but not limited to consultants, nurses, and allied health professionals (Sandstrom et al. 2019).

Activities of Daily Living or ‘ADLs’ is a term that refers to “fundamental skills required to independently care for oneself, such as eating, bathing, and mobility” (Edemekong et al. 2023 para. 1). The term ADLs is commonly used in the clinical setting referring to all functional tasks that individuals usually do on a daily basis. Basic ADLs include mobility, feeding, dressing, personal hygiene, continence, and toileting and are used to indicate functional status (Edemekong et al. 2023). In this work, there are instances in the findings where mobility is mentioned separately from other ADLs, due to the frequency with which it was discussed as a functional activity throughout recovery.

### **1.10 Thesis Format**

With the focus and scope of the research topic in mind, this thesis will include:

- A systematic review of the qualitative literature on the experiences of adults with traumatic injuries, detailing the findings and recommendations for practice and future research (Chapter 2)
- The methodology and methods of the primary qualitative research study conducted in the North of Scotland with adults with traumatic injuries (Chapter 3)
- The findings of the primary qualitative research study including participant demographics, qualitative findings and discussion in context of current literature and practice (Chapter 4)
- A summary of key findings, recommendations for clinical practice in the local area, and areas warranting further research (Chapter 5)

### **1.11 Summary**

This chapter provided the definition of traumatic injuries and justified the focus of this thesis on individuals with major and moderate non-neurological traumatic injuries. With improvements in pre-hospital and acute care, more individuals are surviving traumatic injuries and there is a growing interest in the long-term outcomes, experiences, and rehabilitation needs of this traumatic injury population. The NoS MTN was launched in 2018 and there is an interest to explore the experiences of adults with major and moderate traumatic injuries after leaving the MTC. The next chapter provides a comprehensive review of the current qualitative literature on recovery experiences of adults with traumatic injuries after leaving the acute care setting.



## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

Chapter 1 provided an overview of traumatic injuries and the management of these injuries using trauma networks, highlighting that there is an interest in the experiences and outcomes of individuals with traumatic injuries after leaving the acute care setting. This chapter presents a systematic review conducted using JBI methodology (Lockwood et al. 2020) that explores what is known about the recovery experiences of adults following traumatic injuries after leaving hospital. This chapter details the rationale for conducting the review, methodology and methods used, followed by presenting the synthesised findings, and concluding with the recommendations for clinical practice and future research. The findings of this review justify the need for primary research into the experiences of adults with traumatic injuries in Scotland, presented in the next chapter.

### 2.2 Types of Evidence Synthesis

Evidence syntheses are a type of research that aim to “combine data from multiple sources, most commonly from existing research studies, to provide an overall summary of current knowledge” (National Institute for Health and Care Research 2024 para. 2). In early eras, healing professions relied mainly on practical experiences and knowledge passed on through the profession, but this knowledge was subject to common research biases, such as non-random samples and biases of expectations (Dijkers, Murphy and Krellman 2012).

In the 1970's, there was a fast-growing body of clinical research, creating a challenge for clinicians to keep up with all the current research (Dijkers, Murphy and Krellman 2012). For clinicians to be able to use this new research, they needed to be able to decide what was useful and of high-quality to base their practice on. The issue with having an increasing volume of research was that not all research was of high-quality, highlighting the need for the synthesis of current evidence to inform what would be known as evidence-based practice (EBP). The first version of EBP was called evidence-based medicine (EBM), which was defined as:

*“the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research” (Sackett et al. 1996 p. 71).*

This definition uses the term '*systematic research*' to gather and select the best evidence, but at this time, the early systematic reviews were not systematic and lacked the rigour seen in current systematic reviews (Dijkers, Murphy and Krellman 2012). From the original EBM definition, future EBP definitions expanded to include patient values, alongside the evidence and clinician's knowledge:

*"Evidence-Based Practice (EBP) requires that decisions about health care are based on the best available, current, valid and relevant evidence. These decisions should be made by those receiving care, informed by the tacit and explicit knowledge of those providing care, within the context of available resources"*  
(Dawes et al. 2005 p. 4)

While EBP is widely accepted, the need for rigorous evidence synthesis research continues to grow. The Cochrane Collaboration was formed in 1992 to provide resources for the systematic review of randomised controlled trials in healthcare (Grant and Booth 2009). Organisations such as the Scottish Intercollegiate Guidelines Network (SIGN) and the National Institute for Health and Care Excellence (NICE) were launched in 1993 and 1999, respectively, to provide clinical practice guidelines using the best evidence available (Wyatt 2004; Harbour, Lowe and Twaddle 2011).

There are multiple types of evidence synthesis reviews. All reviews aim to synthesise existing evidence in the literature, but each review type has unique aims and methodology for how literature is evaluated and synthesised (Grant and Booth 2009). Table 6 identifies fourteen different types of reviews that are commonly used in the health information context (Grant and Booth 2009). The following sections discuss the types of reviews that were considered for this thesis, the review methodological choices, and the justification of why a JBI qualitative systematic review was ultimately chosen.

### 2.2.1 Scoping Reviews

A scoping review can be described as a "preliminary assessment of potential size and scope of available research literature" (Grant and Booth 2009 p. 95). As the name suggests, the aim of this type of review is identify the 'scope' of a topic, identifying the current nature and extent of available evidence (Grant and Booth 2009). In the healthcare information setting, there is a continual increase in new research and evidence available, making it necessary to have a review that can account for different types evidence and literature, such as a scoping review (Peters et al. 2020).

**Table 6 – Main Review Types Characterized by the Methods Used, (Grant and Booth 2009) used with permission**

Label	Description	Methods used (SALSA)			
		Search	Appraisal	Synthesis	Analysis
Critical review	Aims to demonstrate writer has extensively researched literature and critically evaluated its quality. Goes beyond mere description to include degree of analysis and conceptual innovation. Typically results in hypothesis or model	Seeks to identify most significant items in the field	No formal quality assessment. Attempts to evaluate according to contribution	Typically narrative, perhaps conceptual or chronological	Significant component: seeks to identify conceptual contribution to embody existing or derive new theory
Literature review	Generic term: published materials that provide examination of recent or current literature. Can cover wide range of subjects at various levels of completeness and comprehensiveness. May include research findings	May or may not include comprehensive searching	May or may not include quality assessment	Typically narrative	Analysis may be chronological, conceptual, thematic, etc.
Mapping review/systematic map	Map out and categorize existing literature from which to commission further reviews and/or primary research by identifying gaps in research literature	Completeness of searching determined by time/scope constraints	No formal quality assessment	May be graphical and tabular	Characterizes quantity and quality of literature, perhaps by study design and other key features. May identify need for primary or secondary research
Meta-analysis	Technique that statistically combines the results of quantitative studies to provide a more precise effect of the results	Aims for exhaustive, comprehensive searching. May use funnel plot to assess completeness	Quality assessment may determine inclusion/exclusion and/or sensitivity analyses	Graphical and tabular with narrative commentary	Numerical analysis of measures of effect assuming absence of heterogeneity
Mixed studies review/mixed methods review	Refers to any combination of methods where one significant component is a literature review (usually systematic). Within a review context it refers to a combination of review approaches for example combining quantitative with qualitative research or outcome with process studies	Requires either very sensitive search to retrieve all studies or separately conceived quantitative and qualitative strategies	Requires either a generic appraisal instrument or separate appraisal processes with corresponding checklists	Typically both components will be presented as narrative and in tables. May also employ graphical means of integrating quantitative and qualitative studies	Analysis may characterise both literatures and look for correlations between characteristics or use gap analysis to identify aspects absent in one literature but missing in the other
Overview	Generic term: summary of the [medical] literature that attempts to survey the literature and describe its characteristics	May or may not include comprehensive searching (depends whether systematic overview or not)	May or may not include quality assessment (depends whether systematic overview or not)	Synthesis depends on whether systematic or not. Typically narrative but may include tabular features	Analysis may be chronological, conceptual, thematic, etc.
Qualitative systematic review/qualitative evidence synthesis	Method for integrating or comparing the findings from qualitative studies. It looks for 'themes' or 'constructs' that lie in or across individual qualitative studies	May employ selective or purposive sampling	Quality assessment typically used to mediate messages not for inclusion/exclusion	Qualitative, narrative synthesis	Thematic analysis, may include conceptual models

**Table 6 – Main review types characterized by the methods used, continued** (Grant and Booth 2009) used with permission

Label	Description	Methods used (SALSA)			
		Search	Appraisal	Synthesis	Analysis
Rapid review	Assessment of what is already known about a policy or practice issue, by using systematic review methods to search and critically appraise existing research	Completeness of searching determined by time constraints	Time-limited formal quality assessment	Typically narrative and tabular	Quantities of literature and overall quality/direction of effect of literature
Scoping review	Preliminary assessment of potential size and scope of available research literature. Aims to identify nature and extent of research evidence (usually including ongoing research)	Completeness of searching determined by time/scope constraints. May include research in progress	No formal quality assessment	Typically tabular with some narrative commentary	Characterizes quantity and quality of literature, perhaps by study design and other key features. Attempts to specify a viable review
State-of-the-art review	Tend to address more current matters in contrast to other combined retrospective and current approaches. May offer new perspectives on issue or point out area for further research	Aims for comprehensive searching of current literature	No formal quality assessment	Typically narrative, may have tabular accompaniment	Current state of knowledge and priorities for future investigation and research
Systematic review	Seeks to systematically search for, appraise and synthesis research evidence, often adhering to guidelines on the conduct of a review	Aims for exhaustive, comprehensive searching	Quality assessment may determine inclusion/exclusion	Typically narrative with tabular accompaniment	What is known; recommendations for practice. What remains unknown; uncertainty around findings, recommendations for future research
Systematic search and review	Combines strengths of critical review with a comprehensive search process. Typically addresses broad questions to produce 'best evidence synthesis'	Aims for exhaustive, comprehensive searching	May or may not include quality assessment	Minimal narrative, tabular summary of studies	What is known; recommendations for practice. Limitations
Systematized review	Attempt to include elements of systematic review process while stopping short of systematic review. Typically conducted as postgraduate student assignment	May or may not include comprehensive searching	May or may not include quality assessment	Typically narrative with tabular accompaniment	What is known; uncertainty around findings; limitations of methodology
Umbrella review	Specifically refers to review compiling evidence from multiple reviews into one accessible and usable document. Focuses on broad condition or problem for which there are competing interventions and highlights reviews that address these interventions and their results	Identification of component reviews, but no search for primary studies	Quality assessment of studies within component reviews and/or of reviews themselves	Graphical and tabular with narrative commentary	What is known; recommendations for practice. What remains unknown; recommendations for future research

Scoping reviews are most commonly used for three purposes: exploring the breadth of the literature surrounding a topic area, mapping evidence, and informing future research, such as systematic reviews (Tricco et al. 2016). When used for appropriate purposes, scoping reviews are an useful tool for providing a broad overview of available evidence on a topic or important concepts (Peters et al. 2020). A limitation of scoping reviews is that while they are comprehensive and systematic, they are not able to inform recommendations for policy or practice as scoping reviews do not assess the methodological quality of the evidence (Peters et al. 2020).

During the preparation of this thesis, the researcher initially planned to use a scoping review to map the qualitative literature on recovery experiences and explore what was already known about this topic. Initial literature searches of qualitative research on this topic identified that there were multiple qualitative studies with published reports that related to the review question, indicating that a systematic review could be a better fit for assessing and synthesising the current evidence on the topic of interest.

### 2.2.2 Systematic Reviews

The definition of a systematic review is “a comprehensive, unbiased synthesis of many relevant studies in a single document using rigorous and transparent methods” (Aromataris and Munn 2020 p. 15). Systematic reviews aim to provide a summary of all relevant existing knowledge on a specific topic (Aromataris and Munn 2020). There are several types of systematic reviews, including the synthesis of quantitative or qualitative evidence.

Perhaps the most well-known of the systematic review types are ones related to quantitative evidence (i.e. numerical data). These are referred to as effectiveness reviews, aiming to “examine the extent to which an intervention, when used appropriately, achieves the intended effect” (Tufanaru et al. 2017 p. 72). Effectiveness reviews use research with experimental, quasi-experimental, and observational study designs and synthesis the quantitative data using a statistical syntheses methods collectively referred to as meta-analysis (Tufanaru et al. 2017). The findings from effectiveness reviews can be used to inform clinical recommendations and indicate areas where further research is required (Tufanaru et al. 2017). As the aim of this research was not looking into a specific intervention, an effectiveness review not undertaken.

Another type of systematic review is a qualitative systematic review, where qualitative data from multiple studies are synthesised. The synthesis of qualitative data varies depending on the methodology and purpose of the review – JBI methodology uses the ‘meta-aggregation’ method that

aims to create, “generalizable statements in the form of recommendations” for clinical practice and policy (Lockwood et al. 2020 p. 27). This differs from other qualitative synthesis methods such as meta-ethnography, narrative synthesis, or thematic synthesis, as the focus is on developing recommendations that can be acted on, instead of theory generation, synthesising different types of evidence, or drawing conclusions across qualitative studies, respectively (Lockwood et al. 2020). Meta-aggregative synthesis is analogous to quantitative meta-analysis in that the review authors do not re-interpret the data, instead qualitative data are grouped together based on similarity of meaning to form synthesised findings (Lockwood et al. 2020).

Many aspects of qualitative and quantitative systematic reviews are similar. Both require an *a priori* protocol detailing the objectives and methods that will be used by the researcher and this is important to ensure transparency in the review process (Aromataris and Munn 2020). Reporting of the systematic reviews should follow the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) guidance (Page et al. 2021a). Both types of systematic reviews also include a methodological quality assessment of the included studies. This assessment provides evidence of the quality of the included studies and adds to the transparency of the reviews findings, as not all studies or evidence available may be of high quality (Aromataris and Munn 2020).

### 2.2.1 Review Methodologies

There are multiple different review methodologies that could have been used for this review, with the most common choices being Cochrane or JBI (formerly known as *Joanna Briggs Institute*).

The Cochrane Collaboration was founded in 1992, with the aim to “promote evidence-informed decision making by producing high quality, relevant, accessible systematic reviews and other synthesized research evidence” (Cumpston et al. 2023 para. 1). The Cochrane Collaboration offers methodology for seven different types of reviews (i.e. intervention reviews, diagnostic test accuracy reviews, prognosis reviews, qualitative evidence syntheses, methodology reviews, overviews of reviews, and rapid reviews). Qualitative evidence syntheses that follow a Cochrane approach can use different methods of data synthesis including thematic synthesis, framework synthesis, and meta-ethnography (Noyes et al. 2019).

JBI was established in 1996 with a similar aim to the Cochrane Collaboration, to “[use] the best available research evidence to inform clinical decision making” (Jordan et al. 2015 p. 118). One way that JBI has expanded on other evidence synthesis organisations is by looking to include a wider range of types of clinical evidence that can be used to inform clinical practice, as this inclusive

approach is beneficial for answering more different types of clinical and care-related questions (Jordan et al. 2015). JBI considers the process to achieving evidence-based healthcare involves four components: “healthcare evidence generation; evidence synthesis; evidence (knowledge) transfer; and evidence utilization” (Pearson et al. 2005 p. 209). The last two components demonstrate JBI’s focus on not only generating the evidence, but also on the information being shared and integrated into practice.

JBI currently offers formal methodological guidance for ten different types of reviews (i.e. systematic reviews of experiences or meaningfulness, systematic reviews of effectiveness, systematic reviews of text and opinion/policy, systematic reviews of prevalence and incidence, systematic reviews of costs of a certain intervention, process, or procedure, systematic reviews of aetiology and risk, systematic reviews of mixed methods, systematic reviews of diagnostic test accuracy, umbrella reviews, and scoping reviews). All the JBI review methods follow the same eight-step format that ensure rigor and quality of the final review, which will be detailed in the Methods (see Section 2.6).

The JBI methodology was chosen for this review as it offered a methodological rigorous process for conducting systematic reviews and matched the applied nature of the research topic and practical aims of generating findings that can be used to inform clinical practice. The use of JBI methodology was also pragmatic, including the availability of training in JBI methodology at the start of the review, having JBI methodology experts on the supervisory team, and the availability of the online JBI-System for the Unified Management of the Assessment and Review of Information (SUMARI) tool for use throughout the review.

### 2.2.2 Justification for Qualitative Systematic Review

Initial searches identified that there were multiple qualitative studies with published reports on the review question topic, so a qualitative systematic review was chosen to explore what qualitative knowledge is known about the topic of interest - the experiences of adults with major and moderate traumatic injuries following discharge from the acute care setting. A systematic review was chosen because systematic reviews rank at the top of the ‘evidence hierarchy’ pyramid for types of evidence used for EBP, indicating the most rigorous methodology and ability synthesise what is known about the topic area (Turner 2023). The qualitative focus of this research meant that a qualitative systematic review was the optimal type of review. The importance of qualitative literature in healthcare can be overlooked, but it is known to “[play] a significant role in understanding how individuals and communities perceive health, manage their own health and make decisions related to health service usage” (Lockwood et al. 2020 p. 24). As the JBI methodology aims to synthesise

evidence for use in clinical practice, it was seen as a way that the literature could be used to inform clinical practice and provide context to the primary aspect of this research.

When assessing the confidence of the findings, JBI qualitative systematic reviews use the ConQual method to rate the confidence in synthesized findings in qualitative reviews. The ConQual method is based on the dependability of the included studies and the credibility of the evidence used in the findings (Munn et al. 2014). The ConQual scores for this review's findings can be found in the Summary of Findings table (see Table 15). This differs from the CerQual method, or *Confidence in the Evidence from Reviews of Qualitative research*, as CerQual assesses the certainty of qualitative systematic review findings based on four criteria: methodological limitations, coherence, adequacy of data, and relevance (Lewin et al. 2018). ConQual was used as it better suited the meta-aggregative synthesis approach used because it considers the credibility of the findings (Munn et al. 2014).

### 2.3 Review Question

The aim of this review was to explore the experiences of adults with non-neurological major and moderate traumatic injuries after leaving the acute care setting, with the intention to provide synthesized qualitative evidence to inform clinical practice and future research on this topic.

The specific review question was: What are the recovery experiences of adults with moderate and major traumatic injuries after discharge from an acute care setting?

### 2.4 Review of Previous Literature

Literature searching of major databases such as CINAHL and MEDLINE identified a number of qualitative and mixed method research studies that explored the experiences of people following traumatic injuries (Claydon, Robinson and Aldridge 2017; Claydon et al. 2018; Ekegren et al. 2020; Robinson et al. 2020; Baker et al. 2021; Kettlewell et al. 2021; Silvester, Trompeter and Hing 2021).

A preliminary protocol search of PROSPERO, MEDLINE, the *Cochrane Database of Systematic Reviews* and *JBI Evidence Synthesis* was conducted and only one similar systematic review protocol on this topic was identified, a qualitative systematic review protocol: *Patient perspectives of recovery following major orthopaedic trauma: a systematic review and qualitative synthesis* (PROSPERO 2022 CRD42022310712) registered to PROSPERO on 17<sup>th</sup> February, 2022. This review has since been completed and published (Norris et al. 2023) and differs from the current review in several important ways. This review conducted by the researcher and used the JBI methodology for qualitative



systematic reviews and was fully inclusive by: 1) included studies with participants with moderate and major trauma (i.e. ISS  $\geq$  9) with a range of traumatic injuries, rather than just major musculoskeletal trauma, 2) searched unpublished literature as well as published, 3) considered relevant studies in any language that was translatable with available translation software (i.e. Google Translate), and 4) included studies from countries similar to the United Kingdom using the Human Development Index (HDI) (United Nations Development Programme 2020).

In the field of trauma care and rehabilitation, other systematic reviews have explored topics involving adults with multiple or major traumatic injuries, such as patient reported outcomes (Ritschel et al. 2021), multidisciplinary rehabilitation (Khan, Amatya and Hoffman 2012; Al Hanna et al. 2020), patient and carers experiences of planning hospital discharge (Collins, Lizarondo and Porritt 2020) and support interventions (Shepherd-Banigan et al. 2018), physical activity (Ekegren et al. 2018), posttraumatic stress (Visser et al. 2017), posttraumatic growth (Kampman et al. 2015), health-related quality of life (Polinder et al. 2010; Silverstein, Higgins and Henderson 2021), and the impact of frailty (Poulton A. et al. 2019).

Individual primary studies that explored the topic of interest were identified in initial searches, but the specific topic of focus of this review had not been synthesised in a review at the start of the thesis. The synthesis of this knowledge is important because of its use in informing clinical and research recommendations in the field of traumatic injury care.

## 2.5 Inclusion Criteria

### 2.5.1 Participants

This review considered studies that included adults who had sustained moderate or major traumatic injuries. The definition of adulthood was decided by the age of inclusion on adult trauma registries for the country of origin for each article, with sixteen as the lowest age in the United Kingdom (i.e. Trauma Audit & Research Network (TARN), Scottish Trauma Audit Group (STAG)) and also in Australia (i.e. Australia New Zealand Trauma Registry) (NHS England 2018; Australian Trauma Quality Improvement (AusTQIP) Collaboration 2021; Public Health Scotland 2021b).

To capture the wide variety of terminology used in traumatic injury literature, the search strategy included terms such as major trauma (i.e. ISS  $>$  15) (Public Health Scotland 2021a), moderate trauma (i.e. ISS  $\leq$  9 to 15) (Public Health Scotland 2021a), multiple trauma, poly trauma, orthopaedic trauma, complex musculoskeletal injuries, severe trauma, and blunt thoracic injuries. Studies where participants sustained peripheral nerve damage (i.e. brachial plexus injury, penetrating injury

damaging nerve tissue) in addition to other injuries were considered.

Studies including both patient and carer/partner/family perspectives and views were included, as long as the patients' views are clearly reported. Studies that focus solely on healthcare providers and/or carers experiences were excluded.

This review did not consider studies where the majority of participants had minor trauma (Injury Severity Score < 9), paediatric populations (i.e. 15 years old or younger), or studies with a focus on narrow trauma subpopulations such as single or mono injuries, burn injuries, spinal cord injuries, or traumatic brain injuries, as the prognosis and management of these patients is different to those with moderate to major traumatic injuries, therefore the experiences of recovery and care received would be different (Ritschel et al. 2021; Silverstein, Higgins and Henderson 2021). Studies with non-civilian participants (i.e. military, veterans) were also excluded, due to the different care pathways available for military personnel and therefore different experiences influencing their recovery (e.g. Defence Medical Services (UK), Veteran Affairs (USA)) (Defence Medical Services 2024; Veterans Health Administration 2024).

### 2.5.2 Phenomena of Interest

The review considered studies that explored the experiences and perspectives of the recovery process for adults with moderate and major traumatic injuries. This included, but was not limited to, topics such as rehabilitation, physical function, pain management, self-management, any unaddressed needs, ongoing limitations, experience of the health system, return to previous recreational activities, return to work/study, mental health and wellbeing, and social participation. These topics are based on the International Classification of Functioning, Disability and Health (ICF) framework, which aims to describe health and disability using a biopsychosocial lens, (i.e. body function/impairments, activities/limitations, and participation/restrictions), (World Health Organization 2002).

### 2.5.3 Context

This review considered studies that captured the experiences of the target population after leaving the acute care setting (e.g. major trauma centre, hospital, specialist rehab) to an unsupervised community setting, such as a home or home-like location. Studies that included experiences of the hospital discharge process were considered, as long as they included experiences from community

settings as well.

This review focused on studies from countries with a 'very high human development' ranking on the Human Development Index (HDI), as these countries are most comparable to the United Kingdom (i.e. HDI over 0.800) (United Nations Development Programme 2020). HDI measures human development in countries based on health, knowledge, and standard of living of its residents and is used to highlight the importance of human outcomes in assessing a country's level of development (Human Development Report Office 2022).

Studies that captured the experiences of participant in the acute care setting (i.e. hospital) or in non-civilian settings (i.e. military, veterans) were excluded.

#### 2.5.4 Types of Studies

Studies of qualitative and mixed method design (with a clear qualitative component) were considered for inclusion in the systematic review. Studies focused on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research and feminist research were considered for inclusion. Original qualitative research with study methods including interviews, focus groups, or observational studies were considered. Mixed methods studies were included in cases where qualitative results were reported separately.

Study types that were excluded from the review were literature reviews, research protocols, quantitative studies, conference abstracts, or clinical practice guidelines. Relevant systematic reviews were not included, but reference lists were screened to identify additional relevant qualitative literature.

## 2.6 Methods

This systematic review was conducted in accordance with JBI methodology for systematic reviews of qualitative evidence (Lockwood et al. 2020) and followed an *a priori* protocol registered in PROSPERO (PROSPERO ID: CRD42022338736) (Kromrey et al. 2022). The reporting of this review used the *PRISMA Checklist for Qualitative Systematic Reviews* can be found in APPENDIX A.

### 2.6.1 Search Strategy

The review question was developed using JBI's systematic review of qualitative evidence **PICo** mnemonic: Population, Phenomena of Interest, and Context (Lockwood et al. 2020).

The search strategy was developed in consultation with a research librarian and considered search terms used in similar systematic reviews focused on outcomes and experiences of people with traumatic injuries (Halcomb et al. 2005; Al Hanna et al. 2020; Silverstein, Higgins and Henderson 2021). The search strategy aimed to locate both published and unpublished studies. To create the search strategy, an initial limited search of MEDLINE and CINAHL (both via EBSCOhost) was undertaken to find relevant reports (see APPENDIX B). Using the reports identified by this initial search, the researcher analysed the title and abstract text words and index terms used and created a general search strategy that included all identified keywords and index terms (APPENDIX B). This general search strategy was then adapted for each information source (i.e. database, grey literature source) with help from a research librarian. A comprehensive search of published and grey literature was undertaken in June 2022, and searches were re-run on April 2023. The search strategies are provided in APPENDIX C.

The databases searched included MEDLINE, CINAHL, SPORTDiscus (all via EBSCO), EMBASE (via Ovid), and Web of Science. Sources of unpublished studies and grey literature included Google (in incognito mode, first 15 pages of results), the Networked Digital Library of Theses and Dissertations (Global ETD), and EBSCO Open Dissertations (EBSCO). Other clinically relevant sources of grey literature such as the Kings Fund, National Audit Office, British Trauma Society, Centre for Trauma Sciences, Trauma Care, and British Society of Rehabilitation Medicine (BSRM) were hand-searched for relevant qualitative literature.

Qualitative literature can pose unique challenges for systematic searches, due to the variation in qualitative methods terminology, inadequate indexing terminology in medical databases, and variable content and quality of study titles and abstracts (Booth 2016). These challenges were addressed in this review by using the supplementary search strategies of reference checking and citation checking to augment the initial database searches (Booth 2016). Reference checking was completed by screening the reference lists of all included studies for any additional relevant qualitative studies. Citation checking identified all recent literature that cited the included studies and was completed using Google Scholar (incognito mode) by searching for the title of the study and then screening the studies that referenced the included study (i.e. indicated by the "Cited by" function).

Reference lists of relevant systematic reviews and literature reviews were screened for additional studies. Searches were conducted using English-language databases and were open to all languages that were translatable using available translation software (i.e. Google Translate). Several reports were translated during title and abstract screening, however, all the included reports were published in the English language. Databases were searched from January 2000 to April 2023, based on preliminary searches identifying appropriate and relevant research between these dates. The Victorian State Trauma System in Australia began in 2000 (Warren et al. 2019) and the first trauma network in England was launched in April 2010 (Kanerria 2015). The initial searches identified that the qualitative research on this topic is within these dates and with the evolution of medical treatments, earlier experiences might not be comparable to present experiences after traumatic injuries.

### 2.6.2 Study Selection

Following the literature search, all identified citations were collated and uploaded to Zotero (Corporation for Digital Scholarship, Vienna, USA) and duplicates were removed. Citations were then uploaded to Covidence (Veritas Health Innovation, Melbourne, Australia) to facilitate screening, removal of duplicates, and selection of relevant reports. Following a pilot test, title and abstracts were screened by two independent reviewers (LK, LA, AG, JB) for assessment against the inclusion criteria for the review. Then full-text reports were retrieved and imported to Covidence by the researcher. Then full texts were screened by two independent reviewers (LK, LA, AG, JB). The protocol stated that all full texts would be screened by researcher and a second reviewer would complete 10% of screening to ensure rigor, but availability of the supervisory team enabled both screening stages to be completed with two independent reviewers.

Full-text reports that did not meet the inclusion criteria were excluded and reasons for their exclusion are provided in APPENDIX D. All disagreements or conflicts that arose between the reviewers were resolved through discussion and team consensus. For reports that had unclear participant populations, authors were contacted for further information (n = 10), with one author responding with clarification that led to the inclusion of two reports.

### 2.6.3 Assessment of Methodological Quality

Eligible full-text reports were imported into the JBI System for the Unified Management, Assessment, and Review of Information (Munn et al. 2019; JBI, Adelaide, Australia). The reports were critically

appraised by two independent reviewers (LK, KC, LA) for methodological quality using the standard JBI critical appraisal checklist for qualitative research (Lockwood, Munn and Porritt 2015). All disagreements that arose between the reviewers were resolved through discussion. As per the protocol, both data extraction and synthesis were conducted for all reports that met the inclusion criteria, regardless of methodological quality, as both high- and low-quality reports can provide potentially valuable insights (Dixon-Woods, Booth and Sutton 2007).

#### 2.6.4 Data Extraction

Data were extracted from included reports by two independent reviewers (LK, LA, KC) using the standardised JBI data extraction tool from JBI SUMARI (Munn et al. 2019). Data extraction was piloted by the researcher and no changes were necessary to the data extraction tool. The data extracted included specific details about study methods and methodology, country of origin, phenomena of interest, context, participant characteristics and sample size, and the author's description of the main results. No further requests for additional data were needed from authors of the included reports.

Study findings and their illustrations were extracted from each paper verbatim (see Table 7) and assigned a level of credibility, as per the JBI levels of credibility: unequivocal (U), credible (C), or not supported (NS) (Lockwood et al. 2020). These three credibility levels relate to the evidence that supports each finding - with *unequivocal* findings as the highest level, where evidence is directly reported (e.g. participant quotes), then *credible* findings, as plausible evidence that could be open to interpretation (e.g. author's summaries), and lastly *not supported* findings, which have no evidence in the text (Aromataris and Munn 2020). The credibility levels of the findings are considered when assessing the credibility of each synthesised finding to inform the summary of findings – the credibility score of the synthesised finding is downgraded for use of credible findings, indicating that the evidence used in the synthesised findings are not all unequivocal and may be open to interpretation.

Table 7 - Examples of Extraction of Findings and Illustrations

Example text from (Braaf et al. 2019) Finding and illustration extracted for systematic review:

**Finding Balance**

Over time most people with injuries re-counted developing insights to their limitations and recognized the need to balance work with their personal life, disability, financial needs, and ongoing treatment. Finding balance was a personal experience, as each individual had to find the right job and the right number of work hours and days. Sometimes finding a sense of balance involved setting priorities and making financial compromises. Some participants received less pay when they accepted reduced hours of work or new work roles to improve their mental health, quality of life, and reduce their pain. However, for many, part-time work provided the balance needed to sustain work arrangements:

*I was working pretty massive hours and I was on reduced capacity. So I was causing all sorts of damage, both to family and my own mental health. ... My work has been decreased over the last 12 months. So I've gone effectively to four days a week, so I can manage my workload a bit better... Everything is going pretty well on the current arrangements. Male\_40-59yrs\_compensable*

Finding	Finding Balance (U)
Illustration	"I was working pretty massive hours and I was on reduced capacity. So I was causing all sorts of damage, both to family and my own mental health.... My work has been decreased over the last 12 months. So I've gone effectively to four days a week, so I can manage my workload a bit better... Everything is going pretty well on the current arrangements." Male_40-59yrs_compensable (p e465)

**Specialized Supports**

Health professionals such as general practitioners (GPs), rehabilitation specialists and occupational therapists (OTs), enabled and supported RTW for workers with injuries by providing advice and advocacy, and by dealing directly with employers:

*The brain rehab specialist, he was fantastic and he actually took on an advocacy role when he [the injured person] was in danger of losing his job again. And he stepped in and had a chat to the company about a return to work plan. Male\_18-39yrs\_non-compensable\_severe TBI\_proxy*

Some people with injuries faced resistance to their attempts to RTW when their manager had changed in the time they were off work. In such instances, a small number of people were able to resume their pre-injury job through involving a union representative:

Finding	Specialized Supports (C)
Illustration	Health professionals such as general practitioners (GPs), rehabilitation specialists and occupational therapists (OTs), enabled and supported RTW for workers with injuries by providing advice and advocacy, and by dealing directly with employers... (p e464)

purple highlighting – finding, pink highlighting – illustration  
Unequivocal (U), Credible (C)

2.6.5 Data Synthesis

Qualitative research findings were pooled by the researcher using JBI SUMARI (Munn et al. 2019) with a meta-aggregation approach (Lockwood et al. 2020). Using the extracted findings, categories were assembled by grouping findings that were similar in meaning. These grouping were discussed regularly with the supervisory team. Each category was assigned a label that represented the meaning of the category. The categories were then grouped into a set of four synthesised findings. Only unequivocal and credible findings were included in the synthesis; all findings extracted were either unequivocal or credible.

2.6.6 Assessing Confidence of the Findings

The final synthesised findings were graded according to the ConQual approach for establishing confidence in the output of qualitative research synthesis and presented in a Summary of Findings (see Table 15) (Munn et al. 2014). Each synthesised finding from the review is presented in the summary, along with the type of research informing it, scores for dependability and credibility, and the overall ConQual score. Dependability of each report was established by using the responses for

the critical appraisal of five criteria relating to the appropriateness of the conduct on research (Lockwood, Munn and Porritt 2015). These scores were then transferred to the related findings from that report. The credibility score was determined using the number of 'unequivocal' and 'credible' findings in each synthesised finding (Lockwood, Munn and Porritt 2015). Depending on whether all findings were unequivocal, a mix of unequivocal and credible findings, or all credible findings, the synthesised finding was labelled as high, moderate, or low credibility, respectively. The dependability and credibility scores were then used to determine an overall ConQual score for each finding.

## 2.7 Results

### 2.7.1 Deviations from Protocol

The following criteria were not included in the *a priori* protocol, but were agreed through team consensus and implemented during screening.

- Due to ambiguity of traumatic injury terminology and unclear reporting, ISS was used to deem whether injuries were of the correct severity for inclusion. In cases where ISS was not clearly reported, clinical experts were consulted to identify ISS using the reported demographics and authors of the report were contacted for further details.
- Reports where there was a mixed study population (i.e. some participants meeting inclusion criteria, but not all), a rule was introduced that over 50% of the study population had to be of the target population to be included, as most qualitative research uses an inductive process to develop findings, basing the findings on the data from all participants (Ritchie et al. 2014a). For these reports, only participant quotes labelled with participant's injury severity were extracted as unequivocal illustrations.
- Mild head injuries were included for consideration, as long as participant had sustained other injuries as well. This was due to the likelihood of mild head injuries occurring in many types of major traumatic injuries, based on expert clinical opinion.



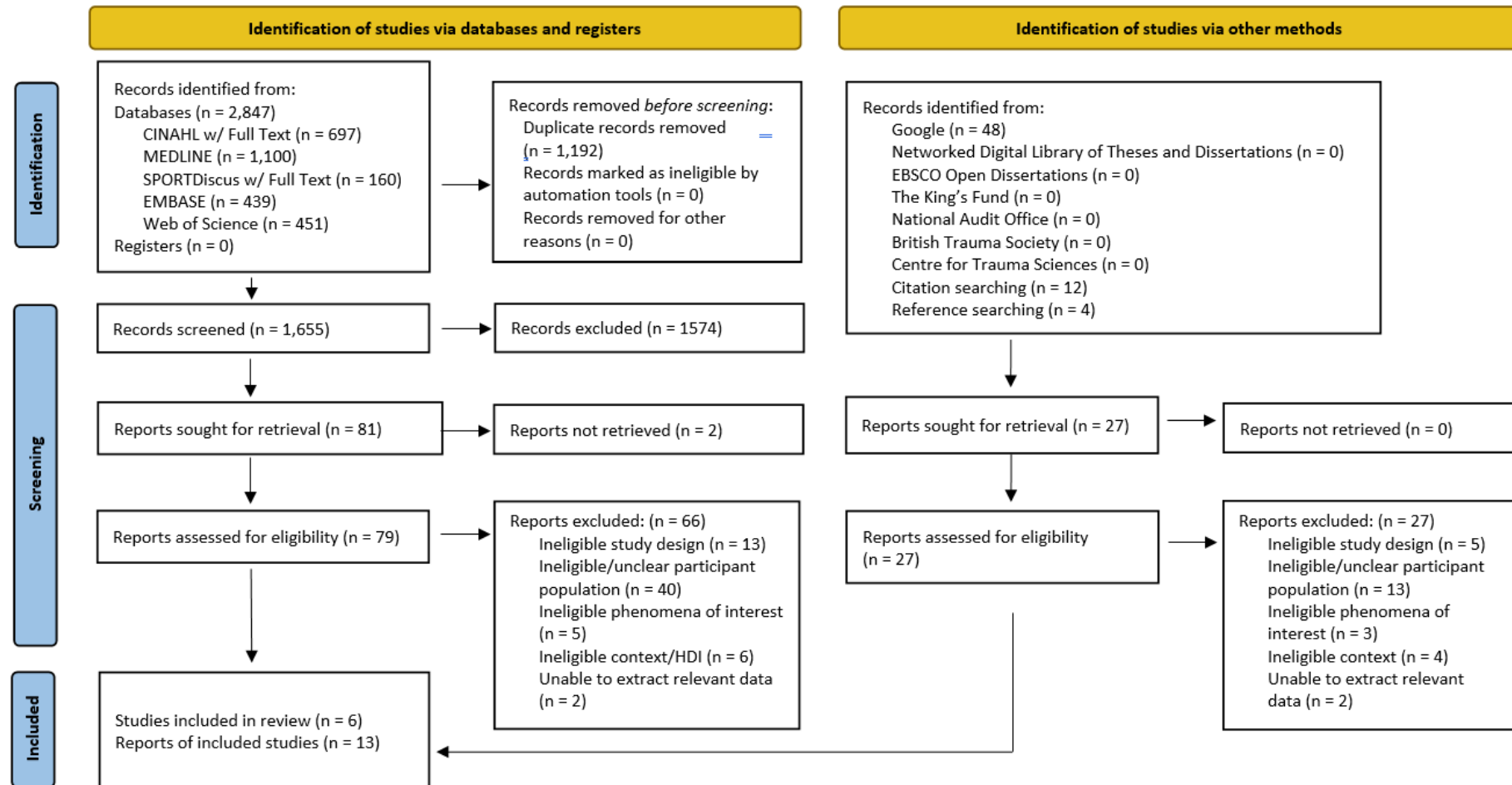


Figure 7 – PRISMA Diagram for Identification of Studies

### 2.7.2 Study Inclusion

The comprehensive search identified 2,847 potentially relevant records. After removal of duplicates (n= 1,192), the titles and abstracts of the remaining records were assessed (n=1,655). Following this assessment, 1,574 records were excluded as they did not meet the inclusion criteria. Of the 81 remaining records, the researcher was unable to access two records, leaving 79 records for full text screening. After examining the remaining reports, it was determined that thirteen met the inclusion criteria and were included in the review. Reasons for exclusion at the full text stage were ineligible study design (n = 13), ineligible or unclear participant population (n = 40), ineligible phenomena of interest (n = 5), ineligible context/HDI (n = 6), or unable to extract relevant data (n = 2). The results of this selection process are displayed in the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) flow diagram (Figure 7) (Page et al. 2021b). Reports excluded at the full text stage are listed in APPENDIX D, along with their reason for exclusion.

Thirteen reports were identified from six different studies.

The *RESTORE: REcovery after Serious Trauma--Outcomes, Resource use and patient Experiences* study is a prospective cohort study with a nested qualitative element aimed to provide information on major trauma patient's outcomes and experiences in the first five years post-injury (Gabbe et al. 2015). Six included reports were published as part of the RESTORE study (Christie et al. 2017; Braaf et al. 2018, 2019, 2020; Ekegren et al. 2018; Reeder et al. 2021), with two reports using the same participant sample population at all three data collection points (Braaf et al. 2020; Ekegren et al. 2020).

*Rib Injury Outcomes Study* (RIOS) was a mixed-method study conducted in England with the aim to evaluate health related quality of life and pain outcomes in patients with blunt traumatic injuries six-months post- hospital discharge (Baker et al. 2021). Two reports were published as part of this study, reporting on different participants (Baker et al. 2021, 2022).

Two reports were on the same study exploring Australian farmers' experiences of returning to farming post-injury (Beattie et al. 2018; Murray et al. 2019). The last three reports reported on individual studies: Claydon, Robinson, and Aldridge (2017) explored how patients with major orthopaedic injuries make sense of their rehabilitation and recovery, Ogilvie et al. (2015) explored how young adults perceive and manage the effects of major traumatic injury, and Conn et al. (2023) characterised the acute care and early recovery experiences of older adult trauma survivors.

As multiple sub-studies from the larger registry studies were included, the following reporting of methodological quality and characteristics will be presented for individual reports, as the reports were observed to vary in methodological quality and characteristics.

### 2.7.3 Methodological Quality

Critical appraisal is an important aspect of systematic reviews as this provides evidence of the quality of the included reports, as not all evidence available may be of high quality (Aromataris and Munn 2020). The methodological quality of the included reports was moderate to high, with all reports scoring “yes” on seven to nine out of the ten questions, demonstrating a good level of detail when reporting the research. Only one report stated their philosophical perspective (Q1) (Conn et al. 2023) and two reports explicitly reported the methodology used (Q2) (i.e. Interpretive Description) (Ogilvie et al. 2015; Conn et al. 2023). As the remaining eleven reports did not explicitly state methodology used, the methodological quality was assessed on the assumption that these reports were conducted using descriptive qualitative methodology, based on the information that was provided in the report. This was discussed and agreed on by the researcher and supervisory team because reporting of methodology may have been limited by factors such as an applied research context and publication word counts (Bradshaw, Atkinson and Doody 2017).

Six reports included a statement locating the researcher culturally and theoretically (Q6), which indicates dependability of the findings (Ogilvie et al. 2015; Claydon, Robinson and Aldridge 2017; Baker et al. 2021, 2022; Reeder et al. 2021; Conn et al. 2023). Five reports did not report on the influence of the researcher on the research (Q7), which negatively impacts on the dependability of these reports’ findings (Christie et al. 2017; Beattie et al. 2018; Braaf et al. 2018; Murray et al. 2019; Conn et al. 2023).

In two reports, it was unclear whether participant voices were adequately represented (Q8) (Braaf et al. 2019; Ekegren et al. 2020). Both reports had relatively large numbers of participants (i.e.  $n = 54$ ,  $n = 66$ , respectively) and the participant quotes represented less than 30% of the participants.

No reports were excluded due to methodological quality, as per the protocol.

**Table 8 - Critical Appraisal Results of Eligible Reports**

Studies	Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total per record
RIOS	Baker et al. 2021	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	9/10
	Baker et al. 2022	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	9/10
AUS farming study	Beattie et al. 2018*	N	Y	Y	Y	Y	N	N	Y	Y	Y	7/10
	Murray et al. 2019*	N	Y	Y	Y	Y	N	N	Y	Y	Y	7/10
RESTORE	Braaf et al. 2018	N	Y	Y	Y	Y	U	N	Y	Y	Y	7/10
	Braaf et al. 2019	N	Y	Y	Y	Y	N	Y	U	Y	Y	7/10
	Braaf et al. 2020**	N	Y	Y	Y	Y	N	Y	Y	Y	Y	8/10
	Ekegren et al. 2020**	N	Y	Y	Y	Y	N	Y	U	Y	Y	7/10
	Christie et al. 2017	N	Y	Y	Y	Y	N	N	Y	Y	Y	7/10
	Reeder et al. 2021	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	9/10
	Claydon et al. 2017	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	9/10
	Conn et al. 2023	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	9/10
	Ogilvie et al. 2015	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	9/10
	Total % per question	8	100	100	100	100	46	62	85	100	100	
*-same participant population, **-same participant population Australia (AUS), REcovery after Serious Trauma--Outcomes, Resource use and patient Experiences study (RESTORE), Rib Injury Outcomes Study (RIOS)												

Y = Yes, N = No, U = Unclear

JBIC critical appraisal checklist for qualitative research

Q1 = Is there congruity between the stated philosophical perspective and the research methodology?

Q2 = Is there congruity between the research methodology and the research question or objectives?

Q3 = Is there congruity between the research methodology and the methods used to collect data?

Q4 = Is there congruity between the research methodology and the representation and analysis of data?

Q5 = Is there congruity between the research methodology and the interpretation of results?

Q6 = Is there a statement locating the researcher culturally or theoretically?

Q7 = Is the influence of the researcher on the research, and vice-versa, addressed?

Q8 = Are participants, and their voices, adequately represented?

Q9 = Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body?

Q10 = Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

#### 2.7.4 Characteristics of Included Reports

The included reports were published between 2015 and 2023. Most of the reports (9/13) were from Australia (Ogilvie et al. 2015; Christie et al. 2017; Beattie et al. 2018; Braaf et al. 2018, 2019, 2020; Murray et al. 2019; Ekegren et al. 2020; Reeder et al. 2021), followed by three from the United Kingdom (Claydon, Robinson and Aldridge 2017; Baker et al. 2021, 2022), and one report from Canada (Conn et al. 2023). See Table 9 for the table of report characteristics.

Two reports listed the methodology used (i.e. Interpretive Description) (Ogilvie et al. 2015; Conn et al. 2023). All reports used semi-structured interviews, except two which reported in-depth interviews (Christie et al. 2017; Braaf et al. 2019). For data analysis, all reports used a type of thematic analysis, except for Claydon et al. (2017) who used Interpretive Phenomenological Analysis. Some specified further; Christie et al (2017) used thematic content analysis and three reports used Braun and Clarke's reflexive thematic analysis (Ekegren et al. 2020; Baker et al. 2021, 2022).

The time of the interview post-injury/post-hospital discharge ranged from five week after discharge from hospital (Baker et al. 2022) to nine years post-injury (Beattie et al. 2018).

The phenomena of interest across the included reports captured recovery experiences of adults after traumatic injuries, starting after discharge from hospital and the early recovery (Ogilvie et al. 2015; Baker et al. 2021, 2022; Conn et al. 2023), return to work (Beattie et al. 2018; Braaf et al. 2019), psychological effects and how people make sense of recovery (Claydon, Robinson and Aldridge 2017; Murray et al. 2019), perception of information and communication with health professionals (Braaf et al. 2018), perception of their future over time (Braaf et al. 2020), importance of social networks and transportation (Christie et al. 2017), engaging in physical activity (Ekegren et al. 2020), and factors that impact on long-term health and mobility (Reeder et al. 2021).

Sample sizes ranged from 11 (Baker et al. 2021) to 114 participants (Christie et al. 2017), with a total of 422 participants, 296 of which were male (70%). Ages ranged from 17 to 88 years of age with a mean of 49.8 years. As only participants with moderate (ISS  $\geq$  9) and major (ISS > 15) traumatic injuries were included, the ISS ranged from 9 – 43. The types of injuries reported were: major trauma using the Victoria State Trauma Registry (VSTR) criteria (Christie et al. 2017; Braaf et al. 2018, 2019, 2020; Ekegren et al. 2020; Reeder et al. 2021), blunt thoracic injuries (Baker et al. 2021, 2022), major orthopaedic trauma (Claydon, Robinson and Aldridge 2017), major trauma (Ogilvie et al. 2015), and multiple injuries (Beattie et al. 2018; Murray et al. 2019). The main mechanisms of injury were transportation-related (e.g. road traffic accident (RTA), motor vehicle collision (MVC) (n = 181), followed by falls (n = 104).

2.7.4.1 Report Characteristics

Table 9 - Report Characteristics

Report	Methodology, methods for data collection/analysis	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Authors' description of main results
Baker <i>et al.</i> , 2021  UK	Methodology - NR Semi-structured telephone interview 6 months post discharge. Reflexive thematic analysis (Braun & Clarke).	Examining challenges experienced by patients with BTI from hospital admission to 6-months after discharge.	7 UK NHS hospitals in England and Wales designated as receiving hospitals for trauma patients. Rib Injury Outcomes Study (RIOS)	<b>N</b> = 11 <b>Age range:</b> 27 - 76 years <b>Gender:</b> male = 8 (73%) <b>Type of injuries:</b> blunt thoracic injuries (rib fractures, co-morbidities, extra-thoracic injuries) <b>MOI:</b> RTA (6), falls (5)	Two themes: (i) Challenges within the acute hospital admission (i.e. pain, analgesic management, processes of investigation and treatment), (ii) Challenges within the post-discharge recovery journey (i.e. managing pain at home, unidentified injuries, mental well-being).
Baker <i>et al.</i> , 2022  UK	Methodology - NR Semi-structured telephone interview 5-8 weeks post hospital discharge. Reflexive thematic analysis (Braun & Clarke).	Describing the discharge and early post-discharge recovery experiences of patients with BTI.	8 UK NHS hospitals in England and Wales designated as receiving hospitals for major trauma patients. Rib Injury Outcomes Study (RIOS)	<b>N</b> = 14 <b>Age:</b> 48 - 86 years <b>Gender:</b> male = 10 (71%) <b>Type of injuries:</b> blunt thoracic injuries (rib fractures, extra-thoracic injuries), polytrauma <b>MOI:</b> falls (12), other (2)	Three themes: (a) challenges in the discharge process, (b) coping at home after discharge and (c) managing medications at home. Pain was a dominant thread running throughout all themes...
Beattie <i>et al.</i> , 2018*  Australia	Methodology - NR In-depth semi-structured phone interview 3 - 9 years post-injury. Thematic analysis.	Investigating the experiences of farmers on returning to farming following a serious farm-related injury.	Victoria, Australia. Injuries occurred on a farm.	<b>N</b> = 31 <b>Age:</b> mean = 58 years (13.7 SD) <b>Gender:</b> male = 26 (84%) <b>ISS range:</b> 14 - 24 <b>Type of injuries:</b> Multiple injuries, burns or other (excluding serious neurotrauma), head injuries,	Five interconnected themes: (i) effect on farm work, (ii) farming future, (iii) safety advocacy, (iv) changes to farming practices, and (v) financial ramifications.

Murray et al., 2019*  Australia	Methodology - NR In-depth semi-structured telephone interview 3 - 9 years post-injury. Thematic analysis.	Investigating the psychological effects of serious farm-related injury on farmers, and how this influences their recovery.	Victoria, Australia. Injuries occurred on a farm.	extremity and/or spine only, chest and/or abdominal injuries only <b>MOI:</b> other animal related (8), motor bike crash (7), horse related (6), fall high (4), struck by/collision with object (3), other (3) Registered in VSTR	"For many farmers, the traumatic circumstances and ongoing impact of their injury are life-changing." Four interconnected themes: importance of a pragmatic outlook; grief, helplessness and loss of independence; traumatic thoughts postinjury; and the importance of the support network and community.
Braaf et al., 2018  Australia	Methodology - NR Semi-structured telephone interview 3 years post-injury. Thematic analysis, framework approach (Ritchie & Spencer).	Exploring seriously injured patients' perceptions of communication with and information provided by health professionals in hospital, rehabilitation and community settings.	Victoria, Australia. RESTORE project (VSTR)	<b>N</b> = 65 <b>Age:</b> mean= 50.7 years (15.5 SD) <b>Gender:</b> male= 42 (65%) <b>ISS median:</b> 17 (14-24 IQR) <b>Types of injuries:</b> major trauma (VSTR criteria) <b>MOI:</b> motor vehicle (22), falls (12), motorcycle (6), pedal cyclist (6), other (19) Registered in VSTR	"Many seriously injured patients faced barriers to communication with health professionals in the hospital, rehabilitation and in the community settings." Key themes: limited contact with health professionals, insufficient information provision, and challenges with information coordination.
Braaf et al., 2020**  Australia	Methodology - NR 3 semi-structured telephone interviews 3, 4 & 5 years post-injury. Thematic analysis, framework approach (Ritchie & Spencer), longitudinal analysis.	Exploring trauma survivors' perceptions of their future over time.	Victoria, Australia. RESTORE project (VSTR)	<b>N</b> = 66 <b>Age:</b> mean= 50 years (15 SD) <b>Gender:</b> male= 44 (67%) <b>ISS range:</b> 3 - 75, median: 17 (14-24 IQR) <b>Type of injuries:</b> Major trauma (VSTR criteria); chest and/or abdominal and other associated injuries, head and other associated injuries, multi-trauma and other associated injuries, orthopaedic injuries only	"Many traumatically injured people had persistent physical and mental impacts. Participants reported being anxious about pain, mobility, work, housing and accommodation, social activities, and finances in their future. Others were hopeful and optimistic regarding their future and developed coping strategies and adopted new viewpoints."

<p>Ekegren CL, Braaf S, Ameratunga S, Ponsford J, Nunn A, Cameron P, et al. 2020.**  Australia</p>	<p>Methodology - NR 3 semi-structured telephone interviews 3, 4 &amp; 5 years post-injury. Reflexive thematic analysis (Braun &amp; Clarke).</p>	<p>Post-traumatic experiences of physical activity participation in people with non-neurological major trauma.</p>	<p>Victoria, Australia. RESTORE project (VSTR)</p>	<p><b>MOI:</b> transportation-related (36), falls (13), other (17) Registered in VSTR</p>	<p>"Despite wanting to be physically active, many participants experienced significant, long-term physical activity restriction after their injury, which persisted over time. Restrictions were often related to a fear of re-injury or of exacerbating pain and fatigue levels... Many participants also recognised the importance of adaptation, goal-setting, self-motivation and determination to be physically active despite limitations."</p>
<p>Braaf et al., 2019  Australia</p>	<p>Methodology - NR In-depth telephone interview 3 years post-injury. Thematic analysis, framework approach (Ritchie &amp; Spencer).</p>	<p>Exploring how people with serious injuries returned to paid employment in the first 3-years after injury.</p>	<p>Victoria, Australia. RESTORE project (VSTR)</p>	<p><b>N</b> = 54 <b>Age:</b> mean= 43.2 years (SD 16.1) <b>Gender:</b> male = 40 (74%) <b>ISS</b> median: 20 (IQR 16 - 25) <b>Types of injuries:</b> Serious injury- no serious neurotrauma, spinal cord injury, or severe traumatic brain injury <b>MOI:</b> transportation-related (24), falls (16), struck by/collision with object or person (6), other (8) Registered in VSTR</p>	<p>"Participant decisions and actions taken to return to work were influenced by their resilience, approach to adjusting goals, priorities and plans, and how social connections and relationships were used and maintained. The environment in which these decisions and actions were taken shaped opportunities for work in meaningful, appropriate, and sustained employment."</p>
<p>Christie et al., 2017  Australia</p>	<p>Methodology - NR In-depth interview 3 years post-injury. Thematic content analysis.</p>	<p>Exploring the importance of social networks and transport for people who had experienced a traumatic injury three years earlier.</p>	<p>Victoria, Australia. RESTORE project (VSTR)</p>	<p><b>N</b> = 114 <b>Age:</b> mean= 47.3 years (16.6 SD) <b>Gender:</b> male = 81 (71%) <b>ISS range:</b> 16 - 29 (for participants with major trauma) <b>Types of injuries:</b> Major trauma (VSTR criteria); Major trauma without TBI/SCI, mild-moderate TBI, or SCI <b>MOI:</b> transportation-related (61), falls (26), interpersonal violence (12), other (15) Registered with VSTR</p>	<p>"Many participants found travelling difficult because of pain, discomfort, fatigue and mobility impairments caused by their injuries which led them to be highly dependent on being a passenger in cars driven by others, or on public transport and taxis, to meet their travels needs. After injury, participants' needs to travel were often high... to attend regular medical and physiotherapy appointments [and] reengage with social activities."</p>



Claydon, Robinson, Aldridge., 2017  UK	Methodology - NR Semi-structured interview 3 - 6 months post-injury. IPA approach.	Exploring how patients make sense of their rehabilitation and recovery following major orthopaedic trauma.	England, UK.	<b>N = 15</b> <b>Age range:</b> 21 - 81 years <b>Gender:</b> male= 12 (80%) <b>ISS range:</b> 5 - 33 <b>Type of Injuries:</b> major orthopaedic trauma, excluding serious and lasting neurological injuries <b>MOI:</b> transportation-related (9), horse riding (2), falls (4)	"Recovery after trauma was conceptualised as a journey through repair and rehabilitation to achieve recovery... represented by three superordinate themes: getting back on your feet, getting the right help to get there, and regaining a sense of normality."
Conn et al., 2023  Ontario, Canada	Interpretive Description methodology. Semi-structured telephone interview 6 months post discharge from trauma centre. Inductive thematic analysis.	Acute care and early recovery experiences of older adult trauma survivors.	2 Level 1 trauma centres in Ontario, Canada.	<b>N = 25</b> <b>Age range:</b> 65-88 years <b>Gender:</b> male= 13 (52%) <b>ISS range:</b> 2 - 34 <b>Type of Injuries:</b> NR <b>MOI:</b> fall (14), MVC (4), pedestrian (2), Assault (2), other (3)	Four themes: "I don't feel like a senior", "don't bother telling him anything", getting back to normal, and "I have lost control of my life".
Ogilvie et al., 2015  Australia	Interpretive Description methodology. 2 semi-structured interviews: pre-hospital discharge, 3 months post hospital discharge. Thematic analysis.	Exploring how young people (16–24 years) perceive and manage the effects of major traumatic injury during the initial six months following injury.	2 Level 1 trauma centres in Australia.	<b>N = 12</b> <b>Age range:</b> 17 - 24 years <b>Gender:</b> male= 9 (75%) <b>ISS range:</b> 10 - 43 <b>Types of injuries:</b> major trauma, majority polytrauma- two or more serious injuries (AIS > 2) in different body regions <b>MOI:</b> MVC (5), MBC (2), fall/jump (2), other (3)	"[Y]oung people experienced a complex process of adaptation involving feelings of vulnerability and loss of control over their physicality, environment and life-course." Self-management strategies: use of information technology, family and friends, and information and validation-seeking from health care professionals.

Reeder et al., 2021 Australia	Methodology - NR Phenomenological approach (keep?) 3 Semi-structured telephone interviews 3, 4 & 5 years post-injury. Thematic analysis, framework approach (Ritchie & Spencer), longitudinal analysis.	Older adults' perceptions of factors that impact their recovery following injury and experiences of managing their long-term health and mobility.	Victoria, Australia. RESTORE project (VSTR)	<b>N = 15</b> <b>Age range:</b> 65 - 75 years <b>Gender:</b> male= 11 (73%) <b>Type of injuries:</b> Major trauma excluding SCI/severe TBI or SCI (VSTR criteria) <b>MOI:</b> NR Registered with VSTR	"Older age at the time of injury ... key factor influencing their recovery. Many participants reported actively attempting to regain their strength and fitness in the first five years following injury... Many older adults reported a decline in their physical function over time."
Abbreviations: NR – not reported, VSTR – TBI – traumatic brain injury, SCI- spinal cord injury, AIS – Abbreviated Injury Score, MVC – Motor Vehicle Collision, MBC ISS UK IPA NHS RIOS RESTORE MOI *-AUS farming study, same population, **-RESTORE study, same population					

### 2.7.5 Review Findings

A total of 82 findings with supporting illustrations (63 unequivocal, 19 credible), were extracted from thirteen reports and combined to create thirteen categories based on similarity of meaning. These categories were then organized into four synthesized findings.

The following sections discuss the synthesised findings of the review. A full list of the findings and illustrations can be found in APPENDIX E. Table 10 - Table 13 detail the relationship between the findings, categories, and synthesised finding. The Summary of Findings (Table 15) can be found on page 78.

#### *2.7.5.1 Synthesised Finding #1*

**Recovery experiences are highly individual and influenced by a range of intrapersonal factors. Adults with major and moderate traumatic injuries describe their personal role in the recovery process, grief and loss of control of their current situation, uncertainty about the recovery process and future ability and opportunities, concerns about aging, and perceived dependence and burden on others.**

Participants described intrapersonal factors that contributed positively with their recovery, such as redefining themselves and their new normal, self-management, and use of coping strategies. There were also challenges around the emotional impact of the rehabilitation and recovery process, as well as uncertainty about recovery and the future, associated with stress and anxiety throughout the recovery process. Other challenges identified were impacts of the aging process on recovery and perceived dependence and burden on others. This synthesised finding was created from four categories and thirty-five findings (Table 10).

#### ***Category 1: Role of self in optimising recovery***

Eighteen findings (fourteen unequivocal (Ogilvie et al. 2015; Claydon, Robinson and Aldridge 2017; Braaf et al. 2019, 2020; Murray et al. 2019; Ekegren et al. 2020; Reeder et al. 2021) and four credible (Claydon, Robinson and Aldridge 2017; Braaf et al. 2020; Baker et al. 2022; Conn et al. 2023)) were combined to form this category.

**Table 10 - Synthesised Finding #1**

Finding	Category	Synthesised Finding
Optimizing recovery (C) Getting on with it (U) It's up to me (U) 'I think I've definitely, grown from this experience' (U) The importance of a pragmatic outlook (U) Getting back to normal (C) Redefining normal and the future (U) Doing the right thing (U) Measuring progress (C) Restoring independence (U) Redefining me (U) Finding Balance (U) Self-management and adaptation (U) Living in the present (U) Preventive action (U) Hopeful (C) Recognising the importance of self-motivation and self-management (U) Control my frustration (U)	<b>Role of self in optimising recovery</b>	<b>Recovery experiences are highly individual and influenced by a range of intrapersonal factors.</b> Adults with major and moderate traumatic injuries describe their personal role in the recovery process, grief and loss of control of their current situation, uncertainty about the recovery process and future ability and opportunities, concerns about aging, and perceived dependence and burden on others.
Grief, helplessness and loss of independence (U) "I have lost control of my life" (C) Feeling powerless to change of plan the future (U) Future losses and opportunities (U) Grieving the loss of important roles, relationships and enjoyment of life (U) 'If I'm not distracted, I feel pain, I feel emotion' (U) Farming future (U) Dealing with uncertainty (U) An uncertain future (U) Future viewpoint over time (U)	<b>Grief, loss of control, &amp; perceived uncertainty about recovery and future ability/opportunities</b>	
Expectations of recovery as an older adult (U) The perceived combination of injury and ageing (U) Impact of ageing (U)	<b>Concerns about aging with injuries</b>	
The role of taxis (U) Dependence on others for transport (U) Emotional burden (U) Being a burden on others (U)	<b>Perceived dependence on services and burden on others</b>	

Early in recovery, participants compared their current condition to their pre-injury condition (Ogilvie et al. 2015; Claydon, Robinson and Aldridge 2017), but later on, started to re-define themselves and what their new normal was (Claydon, Robinson and Aldridge 2017; Braaf et al. 2020). This mindset shift was accompanied by acknowledging the impact of emotional burden they experienced (Ogilvie et al. 2015), accepting their current condition (Reeder et al. 2021; Conn et al. 2023), setting new baselines which shaped future priorities and goals (Braaf et al. 2020), and finding balance with their personal life, disability, financial needs, and ongoing treatments (Braaf et al. 2019).

*"I think there is a new normal, because my old normal can't be anymore ... . probably about a year, year-and-a-half, when I sort of felt this is it, day in, day out ... I think it sort of took me until then to realise that life wasn't going to be normal anymore ... [you] need to make new goals because the ones that you had are not attainable any more." Female\_50-59yrs\_Multiple fractures and abdominal injuries\_yr3\_#724\* (Braaf et al. 2020 p. 2713)*

Self-management of their condition was described, with participants reporting that rehabilitation was “up to me” and having the desire to “do the right thing” (Claydon, Robinson and Aldridge 2017 p. 326). This was challenging initially, as participants described being reliant on others as they were unable to complete “simple tasks’ due to restricted mobility, reduced weightlifting tolerance, and impeded movement (Baker et al. 2022). Participants described experiences of self-managing their condition in terms of functional limitations (i.e. adapting techniques, mobility aids, attending gym for strengthening, pacing activities) (Reeder et al. 2021), as well as engaging with physical activity after initial rehabilitation finished (i.e. home exercise, group classes) (Ekegren et al. 2020). Participants mentioned using coping strategies, such as only making short-term plans and going day-by-day (Braaf et al. 2020) and controlling frustration by looking to future, setting goals, doing what they could to help themselves (Claydon, Robinson and Aldridge 2017).

*"Basically at the end of the day, it's up to me I think. Whether I, I mean obviously the operations and things weren't up to me, but I feel the physio, it, it's you can get the best advice, but unless you take it and get on with it you may not get the best result" Beth (Claydon, Robinson and Aldridge 2017 p. 325)*

A pragmatic mindset was observed for some participants, using phrases such as “get on with it” (Claydon, Robinson and Aldridge 2017 p. 324; Murray et al. 2019). Some participants voiced that

they were hopeful and optimistic about not having lasting impacts from the injury in the future (Braaf et al. 2020).

*"I've got a good outlook. Don't whine about anything, just look forward and get on with it. If it hurts, it doesn't matter, just do it." (Male, firearm incident, chest and abdominal injuries) (Murray et al. 2019 p. 4)*

Participants reported the goal for recovery was to have an active, independent lifestyle (Conn et al. 2023) and be able to complete daily activities with confidence and enjoyment (Claydon, Robinson and Aldridge 2017). Once individuals were able to complete daily activities independently, some participants reported they were more careful with their usual activities (Baker et al. 2022), as well as taking proactive approaches to managing their injuries to minimise the impact of the injury on their physical condition (Braaf et al. 2020). Participants reported different measures of progress, such as "physiological (fracture healing), physical (range of movement, starting to weight bear), functional (return to work or usual activities) and emotional (confidence, enjoyment)" (Claydon, Robinson and Aldridge 2017 p. 326).

*"[My future physical state is] probably about what it is now. It only limits you if you let it, and I ain't letting it ... If you've got a good set in your mind, that it [the injuries] aren't going to stop you, that you can do anything, you will do it."*  
*Male\_50-59yrs\_lower extremity fractures\_yr3\_#553\* (Braaf et al. 2020 p. 2712)*

**Category 2:** *Grief, loss of control, & perceived uncertainty about recovery and future ability and opportunities*

Ten findings (nine unequivocal (Ogilvie et al. 2015; Claydon, Robinson and Aldridge 2017; Beattie et al. 2018; Murray et al. 2019; Braaf et al. 2020; Ekegren et al. 2020), one credible (Conn et al. 2023)) were combined to form this category.

Initially, participants described anxiety and stress associated with uncertainties surrounding the healing of their injuries (i.e. whether bones would heal, how long it would take, when they could return to their normal activities) (Claydon, Robinson and Aldridge 2017). For young adults, the emotional burden of the injury was perceived as overwhelming, experiencing stress and anxiety during the self-driven rehabilitation and recovery process (Ogilvie et al. 2015).

Participants also described personal and social losses associated with the injury. The loss of participation in physical activities impacted on participants' social lives and their ability to carry out caring responsibilities (Ekegren et al. 2020). Some older adults experienced a loss of freedom and independence following the injury (Conn et al. 2023). Many participants reported frustration, concerns, and anxiety at not being able to control important aspects of their personal life (i.e. finances, social interaction, employment, living arrangements, and future plans) (Braaf et al. 2020).

Participants reported ongoing emotional impacts of the injury, describing perceived helplessness, frustration, and grief over the loss of their pre-injury life (Murray et al. 2019). Participants also voiced concerns about the long-term impact of the injury on health and consequences of their physical condition. Due to this uncertainty, participants described experiencing stress, fears and anxieties about pain, independence, and mobility (Braaf et al. 2020). Participants also described disruptions to long-term life plans and a perceived loss of future opportunities (i.e. loss of active lifestyle and caring activities reported by younger adults, loss of future employment opportunities reported by working-age adults, and recreational activities reported by all ages) (Braaf et al. 2020).

Braaf et al. (2020) found that participants' perspectives of their future remained consistent over time (i.e. 3-5 years post-injury); those that reported feeling hopeful about their future at three years post-injury reported similar feelings at five years post-injury. Conversely, those that believed their condition would continue to deteriorate reported similar feelings at subsequent interviews.

*"There's massive turmoil that goes on inside, where you're new physically and new mentally and there's a lot of guilt and self pressure and confusion about what others expect of you. I don't know when I should be pushing myself, when I should be holding back more, like I don't know if I'm being lazy or wise, I don't know if I'm being crazy or if I'm just trying to push myself to get better. . . . you've never been through this before so you don't know how strong you are. All you have is your mind and your mind plays tricks and so you just never know what you're meant to be doing" (Emma, 19) (Ogilvie et al. 2015 p. 1844)*

### **Category 3: Concerns about aging with injuries**

Three unequivocal findings (Braaf et al. 2020; Reeder et al. 2021) were combined to form this category. Older adults perceived that their age and the aging process had an impact on their recovery and were concerned about how both the injury and aging would impact on their physical and functional abilities, ultimately influencing their independence in the future. Participants noted

losses of strength, flexibility, fitness, balance, and mobility (Braaf et al. 2020), with the belief that their condition was unlikely to improve. There were concerns of developing arthritis in the injured joints, adding to concerns of future pain and limited mobility. Some perceived that the challenges of recovery were greater due to their age, and impacted on the pace and extent of possible recovery. Others reported they were motivated to find ways to maintain their fitness while aging.

*I also had a problem, and this is probably age, I didn't have the lift in the muscles of my legs. I hate the fact that I'm getting older and that perhaps I need to work harder to keep the muscles strong. (Female\_MT2\_non-compensable\_year\_3)*

*(Reeder et al. 2021 p. 5)*

**Category 4: Perceived dependence on services and burden on others**

Four unequivocal findings (Christie et al. 2017; Claydon, Robinson and Aldridge 2017) were identified where participants reported dependence on their social network during recovery, perceiving themselves to be a burden on others. With independent mobility limited by pain and discomfort, participants reported dependence on friends and relatives for transportation to access services (i.e. medical treatments and rehabilitation), and to maintain their social networks. For those that weren't able to drive themselves or access social networks or public transportation, taxis provided 'personal automobility', but were added expense and perceived to be unreliable if living in rural areas (Christie et al. 2017).

*"I wasn't able to drive. And even now, driving from (name of suburbs) to visit my mum, who obviously doesn't drive anymore, is a hassle, which is another burden I put on my husband. On his day off, "Can you drive me over to see my mum?""*  
*(Female, Metro, Patient, Major, Transport related, 46, Head, thoracic and dental injuries, spinal fractures). (Christie et al. 2017 p. 88)*



### 2.7.5.2 Synthesised Finding #2

**Enduring physical and psychological consequences impact on recovery experiences following traumatic injuries. Adults with major and moderate traumatic injuries experience ongoing physical and psychological issues post-injury, requiring individuals to adapt their physical and occupational activities during recovery.**

Participants reported a range of ongoing physical and psychological issues following the injury, such as pain, reduced mobility, concurrent and/or secondary health conditions, traumatic thoughts and psychological burden from the injury. These ongoing issues impacted on the participants' ability to engage in physical activity and occupational pursuits. This synthesised finding was created from four categories and twenty-six findings (Table 11).

#### **Category 5: Ongoing physical and psychological issues during recovery**

Eight findings (six unequivocal (Ogilvie et al. 2015; Murray et al. 2019; Baker et al. 2021, 2022; Reeder et al. 2021) and two credible (Braaf et al. 2020; Reeder et al. 2021)) findings indicate that participants experienced ongoing physical and psychological issues during the recovery phase.

Participants described physical issues following their injuries such as pain and reduced mobility (Baker et al. 2022). Some participants described having to self-advocate when symptoms didn't improve within expected timeframes, with further investigations sometimes revealing additional undetected injuries (Baker et al. 2021). Older adults reported having to manage concurrent health conditions (i.e. HTN, diabetes, high cholesterol), as well as persistent secondary conditions from the injury (i.e. pain, fatigue, mental health issues) (Reeder et al. 2021). This population was also concerned about their risk of falls and weight gain post-injury (Reeder et al. 2021).

*"Because my ankle has been fused ... if I'm walking on uneven ground, I've got to be very careful where I put my foot and put my weight." (Male\_MT5\_compensable\_year 3) (Reeder et al. 2021 p. 7)*

**Table 11 - Synthesised Finding #2**

<b>Finding</b>	<b>Category</b>	<b>Synthesised Finding</b>
Impact of injuries on mental wellbeing (U) The Hidden Injury (U) Living with symptoms after discharge (U) Traumatic thoughts post-injury (U) Dealing with concurrent health conditions and conditions secondary to injury (C) Concerns about falls (U) Persistent pain and mental health issues (C) 'I was ok, and then it hit me!' (U)	<b>Ongoing physical and psychological issues during recovery</b>	<b>Enduring physical and psychological consequences impact on the recovery experiences following traumatic injuries.</b> Adults with major and moderate traumatic injuries experience ongoing physical and psychological issues post-injury, requiring individuals to adapt their physical and occupational activities during recovery.
Medication safety (U) Pain and analgesics at home (U)	<b>Pain management and medications</b>	
Trying to remain physically active (C) The need to compromise on activity options and adapt to injury (U) A mismatch of desire and ability to be physically active (U) Avoiding activity due to fear of re-injury or of exacerbating symptoms (U) Loss of motivation to be active due to mental health issues (U) Concerns about their long-term health decline as a result of physical inactivity (U)	<b>Challenges of physical activity during recovery</b>	
Drive for Occupational Engagement (U) Adjusting to Work Post-Injury (C) Changing Jobs to Find Meaningful and Appropriate Work (C) Supportive Workplace (U) Social Support and Connections (C) Specialized Supports (C) Making Considered Decisions (U) Effect on farm work (U) Changes in farming practices due to injury (U) Financial Impact (U)	<b>Occupational and income considerations during recovery</b>	

In addition to physical issues, some participants also reported psychological issues post-injury. Some participants described the significant mental and emotional impact the injury had on themselves, as well as those around them (Ogilvie et al. 2015). Some participants described experiencing traumatic thoughts about the injury, which subsided after a period of weeks and/or months following the injury (Murray et al. 2019). For adults with blunt thoracic injuries, there was a mixed report of psychological

burden from the injury, with some reporting no impacts to their mental wellbeing because they were able to see progress in their recovery, while others described a psychological burden from the injury and recovery journey, speed of recovery, and isolation from their ongoing disability (Baker et al. 2021). Participants voiced concerns about experiencing pain the future, as well as concerns that their current psychological state would continue into the future (Braaf et al. 2020).

*"I had a mental replay of the whole incident, which went round my mind endlessly, every waking hour. And then that slowly became less, to where it would just become a snippet." (Male, fall from a horse, multiple fractures) (Murray et al. 2019 p. 4)*

#### **Category 6: Pain management and medications**

Two unequivocal findings (Baker et al. 2021, 2022) related to pain management via use of medications. Participants with blunt thoracic injuries reported that initially, pain was a significant challenge, but noted improvement in pain levels in the following weeks to months, with many reporting the majority of injury-related pain resolving by six months post-discharge from hospital (Baker et al. 2021). While pain was prevalent for many participants, this population reported that there was minimal to no information on safety of using medication for pain relief or guidance on weaning off opioid analgesia (Baker et al. 2021, 2022).

*[Cilla 70] 'But after about three weeks, I must have been feeling that I could manage without it and I tried to cut the Tramadol by half but that didn't work, so I went back on to the full dose again. But then I was beginning to get incredibly nauseous. I couldn't eat ... And finally, I thought no I've just got to get off the opioids regardless of the pain. So, I just gritted my teeth and came off them completely for a week. It was a pretty miserable week.'* (Baker et al. 2021 p. 5)

#### **Category 7: Challenges of physical activity during recovery**

Six findings (five unequivocal (Ekegren et al. 2020) and one credible (Reeder et al. 2021)) show that participant's physical activity was impacted by their injury. Participants reported the desire to be physically active, but many experienced significant persistent physical activity restrictions (i.e. limited exercise capacity, deficits in mobility and balance, impaired vision, pain). Some found they were still able to engage in physical activities by adapting the activity (i.e. pacing, adaptive equipment, reduce

intensity, alternative activity). Some participants reported they avoided or were scared to do physical activity in case they experienced another accident or exacerbate their symptoms (i.e. pain, fatigue). Motivation to be physically active was also impacted by mental health issues for some participants. (Ekegren et al. 2020)

The impact of physical inactivity on health was reported as a concern by some participants, especially concerning long-term health (Ekegren et al. 2020). Older adults with lower limb orthopaedic injuries reported feeling “slowed down” by the injury three years after, with multiple factors contributing to reduced mobility and activity (i.e. limited range of motion and strength, pain, unsteady gait) (Reeder et al. 2021).

*"I use to like to walk, don't do that anymore. I've sort of lost interest in a lot of things, which I'm trying not to do that. I don't know whether it's because I don't have the energy or I'm depressed, I don't know which one it is. You wake up and you think I don't feel too bad today but by the time you crawl out of bed and you think I can take all these different medications but I don't want to do that because they're addictive, I don't want that. I just want to be able to go for a walk."*

*Female, 60 years. Spinal fractures; motor vehicle accident; 4 years after injury,*

*#97377 (Ekegren et al. 2020 p. 192)*

### **Category 8: Occupational and income considerations during recovery**

Ten findings (six unequivocal (Beattie et al. 2018; Braaf et al. 2019) and four credible (Braaf et al. 2019)) related to occupation and financial considerations post-injury.

Braaf et al. (2019) reported numerous factors that were perceived to influence a successful return to work experience. Participants valued supportive coworkers and employers that were effective, respectful communicators and responsive to their needs. Health professionals (i.e. GPs, rehabilitation specialists, OTs) supported the return to work by providing advice and advocacy for participants. Other groups that assisted with return to work process were union representatives, insurers, injury insurer case managers, and work-based return-to-work coordinators. Participants' personal connections also facilitated the return to work, with coworkers and managers providing practical and moral support in the work environment and participants' wider social network providing emotional, informational, and instrumental support.

Motivations to return to work varied, with participants reporting financial benefits, feeling useful and a sense of achievement, enjoyment of work, as well as the concern that their job role would not be

available if they were off for a long time. Participants described considering and planning how to return to paid work that they found meaningful, satisfying, and achievable, including logistics of the workplace environment. Participants described resilience and adaptation to post-injury circumstance during the return-to-work process. When participants decided to change employment, some of the reasons reported related to employers failing to respond to needs, unsatisfying work, or work being too demanding (physically or mentally). (Braaf et al. 2019)

A report by Beattie et al. reported on farmers' experiences of returning to farm work after a major injury (2018). Some participants reported receiving adequate support to maintain the farm, while others reported that they had to return to farming prematurely, negatively impacting on their recovery. Others that were not able to return to work during recovery reported overall negative impacts on the farm as necessary work was not completed and experienced negative financial impacts due to loss of farm production, supplementary income, and the need to employ additional labour to maintain the farm during their recovery. Of those that returned to farming, the injury prompted participants to instigate safety changes to both the farm environment as well as their current behaviours.

*"It had a financial impact, yes. There was no income for virtually 12 months."  
(Male, fall from farming structure, multiple fractures) (Beattie et al. 2018 p. 140)*

2.7.5.3 Synthesised Finding #3

**Adults recovering from major and moderate traumatic injuries access a range of health and care services, as well as social support, during recovery. While these supports are valued, barriers to engaging with services and social support exist.**

Participants report accessing a range of health services and support for engaging in physical activity during recovery, but some experienced barriers to accessing services and support, relating to financial and transportation issues. Importance of social support was highlighted, but participants identified barriers to participating in their usual social activities, such as lack of transportation, environmental barriers, and psychological factors. This synthesised finding was created from two categories and seven findings (Table 12).

**Table 12 - Synthesised Finding #3**

Finding	Category	Synthesised Finding
Health and support service use (C) Support from other people and services (U) The importance of the support network and community (U)	<b>Use of health services &amp; social support to aid recovery</b>	<b>Adults recovering from major and moderate traumatic injuries access a range of health and care services, as well as social support, during recovery.</b> While these supports are valued, barriers to engaging with services and social support exist.
Environmental barriers (C) Engaging with social activities (U) Access to services (U) Impacts on social integration and relationships (C)	<b>Challenges faced when engaging with services and social support</b>	

**Category 9: Use of health services & social support to aid recovery**

Three findings (two unequivocal (Murray et al. 2019; Ekegren et al. 2020) and one credible (Reeder et al. 2021)) showed that multiple types of services and support were valued by participants. Older adults reported using health services (i.e. GPs, surgeons, and psychologists) in the five years post-injury for issues related to ongoing disability from the injury (Reeder et al. 2021). Participants reported multiple forms of support were used to participate in physical activities, including funding for modified activities from injury and health insurers, motivation from physical social activities, and activity adaptations advice from clinicians (Ekegren et al. 2020). Emotional support from participant's social network was reported to be significant in the recovery process (Murray et al. 2019).

*"If I didn't have family it may have been a different ballgame. It's hard to say, isn't it? But I know they did a lot ... I don't know how people survive without it really,*

*without a friend or a family member." (Female, fall, multiple fractures) (Murray et al. 2019 p. 4)*

**Category 10: Challenges faced when engaging with services and social support**

Five findings (three unequivocal (Ogilvie et al. 2015; Christie et al. 2017; Reeder et al. 2021) and two credible (Christie et al. 2017; Reeder et al. 2021)) showed that there were barriers to accessing services and social support. Participants reported a range of barriers to accessing health services, such as "funding provided by injury insurers, affordability of health services, availability of transport, living in rural locations, and age at time of injury [for accessing disability insurance]" (Reeder et al. 2021 p. 6).

Participants reported a reduction in social activities after the injury, due to a range of factors (i.e. mobility challenges and reduced confidence, feeling self-conscious, stress and anxiety, unable to drive) (Reeder et al. 2021). Participants reported that dependence on friends and family for transportation limited the social activities they were able to engage in (i.e. social contact, supporting roles) (Christie et al. 2017). Participants that were wheelchair users described barriers to engaging in social activities due to inaccessibility of the environment (Christie et al. 2017).

*About 18 months all of a sudden [the injury insurer] stopped it [physiotherapy].  
They said if I want to go and get other private attention I could, but I have trouble  
with transport ... [and] I'm not in private health insurance. I'm only on the pension  
... so, I couldn't afford that. (MT6\_Year 4) (Reeder et al. 2021 p. 6)*

2.7.5.4 Synthesised Finding #4

**Patient – healthcare professional communication and information provision are valued by adults recovering from major and moderate trauma. Adults with major and moderate traumatic injuries seek out recovery-related information from a variety of healthcare providers and value the use of accessible language. During and after the transition to community care, a lack of access to recovery-related information and the continuity of information provided are identified as challenges throughout recovery.**

Participants sought out information from a range of health and care providers during recovery. The importance of accessible, consistent information and communication was voiced, as this enabled participants to understand their condition and treatments. During the transition from hospital to community care, participants valued contact with healthcare professionals. This synthesised finding was created from three categories and fourteen findings (Table 13).

**Table 13 - Synthesised Finding #4**

Finding	Category	Synthesised Finding
Clarity of information (C) Community care (C) Provision of written information (U) Seeking information (C)	<b>Information provision by healthcare providers</b>	<b>Patient – healthcare provider communication and information provision are valued by adults recovering from major and moderate trauma.</b> Adults with major and moderate traumatic injuries seek out recovery-related information from a variety of healthcare providers and value the use of accessible language. During and after the transition to community care, a lack of access to recovery-related information and the continuity of information provided are identified as challenges throughout recovery.
Favourable communication attributes (C) Unfavourable communication attributes: dismissal of patient concerns (U) Unfavourable communication attributes: a lack of patient engagement (U) 'They don't really understand at all' (U)	<b>Communication with healthcare providers</b>	
Concern about the organisation of their information between hospital and primary care providers (U) Fragmented information about their injuries and the care delivered (U) Lack of individualised transitional care from rehabilitation to community-based exercise programs (U) Consistency of information (U) Access to information (U) Single point of communication for patients and health professionals involved in their care (U)	<b>Lack of continuity and access to information after transition to community services &amp; care</b>	



**Category 11: Information provision by healthcare providers**

Four findings (one unequivocal (Braaf et al. 2018) and three credible (Braaf et al. 2018, 2020)) showed that participants sought out information as a way to cope with the uncertainty they faced, wanting information from health professionals and others on how to continue independent rehabilitation and self-manage their condition (see Table 14) (Braaf et al. 2020).

**Table 14 - Professions and Types of Information Sought by Participants**

<b>Profession</b>	<b>Types of information sought</b>
<i>General Practitioners (GPs)</i>	“managing, treating and reducing persistent physical and psychological disability and chronic pain, as well as return to work” (Braaf et al. 2018 p. 6)
<i>Physiotherapists</i>	“improving strength, fitness, range of motion in damaged joints, and increasing mobility was also desired from physiotherapists” (Braaf et al. 2018 p. 6)
<i>Surgeons, medical specialists</i>	“long-term treatment plans, recovery timeframes, managing ongoing disability, and pain management” (Braaf et al. 2018 p. 6)
<i>Injury insurers</i>	“how long insurers would provide financial support” (Braaf et al. 2020 p. 2713)

Participants reported that information provided by health professionals that used inaccessible language (i.e. medical terminology) created confusion and impeded their understanding of their condition and treatments (Braaf et al. 2018). Participants suggested that providing information in written form could improve communication and coordination of information (Braaf et al. 2018).

*“For me it would have been no good telling me anything at (hospital name). Perhaps if (hospital name) issued you ... a (written) summary of what your injuries were when you were brought in, what you were diagnosed with and resulting treatments that they performed.” Male\_1729yrs\_road traffic injury\_multiple injuries\_rehabilitation care\_#581 (Braaf et al. 2018 p. 8)*

**Category 12: Communication with healthcare providers**

Four findings (three unequivocal (Ogilvie et al. 2015; Braaf et al. 2018) and one credible (Braaf et al. 2018)) demonstrated the importance of patient-centred communication. Participants described examples of positive communication with healthcare providers including active discussions, use of simple language, and explaining reasoning for medical decisions (Braaf et al. 2018). Participants also appreciated “frequent contact, a sensitive and attentive manner, personalising information, good listening skills, not rushing communication, and being responsive to their needs and questions” (Braaf et al. 2018 p. 8).

Not all communications were perceived to be positive, with some participants perceiving a lack of two-way communication between themselves and healthcare providers or when their concerns were dismissed or failed to be addressed by healthcare providers (Braaf et al. 2018). Young adults reported feelings of frustration and anxiety when they perceived a power imbalance between themselves and healthcare providers, leading participants to look for other sources for recovery-related information (Ogilvie et al. 2015).

*“I just think they (surgeons) could have asked me was there any issues, because I did have issues. I had a neck issue, and I still have a neck issue...” Male\_60–69yrs\_road traffic injury\_multiple injuries\_community care\_#381 (Braaf et al. 2018 p. 8)*

**Category 13: Lack of continuity and access to information after transition to community services & care**

Six unequivocal findings (Braaf et al. 2018; Ekegren et al. 2020) were combined to form this category. Participants perceived healthcare providers to be responsible for the communication of information involving follow-up appointments and discharge summaries, especially during the transition between hospital and community care (Braaf et al. 2018). When this information was not conveyed in a timely or accessible manner, participants perceived this to negatively impact on their health. Some participants reported they were not in contact with health professionals after their discharge from hospital, resulting in feeling isolated and unsupported during their recovery (Braaf et al. 2018). For those that did initially receive formal rehabilitation, there was an absence of ongoing individualised community-based exercise opportunities, with participants reporting that ongoing guidance from clinicians would have enabled them to be more physically active (i.e. supervised gym sessions, modified sports) (Ekegren et al. 2020).

Some participants also reported receiving conflicting and fragmented information from healthcare providers in both verbal and written documentation, which impacted on their understanding of their condition and ongoing management (Braaf et al. 2018). It was suggested that this could be improved by having a single point of communication for patients and health professionals (i.e. case manager) (Braaf et al. 2018).

*“I was told I was supposed to go back in a month’s time ... and have a follow up x-ray. When I rang to get that organised no-one knew about it (or) me and they had no idea what I was talking about... I didn’t have any more X-rays... but I still had broken ribs... So my right lung wasn’t working properly, and that’s why I got pneumonia.” Male\_40–49yrs\_non-transport injury\_multiple injuries\_community care\_#533 (Braaf et al. 2018 p. 8)*

#### 2.7.6 Summary of Findings

The Summary of Findings are displayed in Table 15. The first and second synthesised findings were assigned a moderate ConQual score, due to high dependability and moderate credibility of the findings. This relates to the synthesised findings including unequivocal and credible findings. The third and fourth synthesised findings were assigned low ConQual scores, due to moderate credibility and moderate dependability. The dependability relates to the methodological quality reported in the reports, specifically for the questions locating researcher (Q6), acknowledging influence of researcher (Q7).

**Table 15 – Summary of Findings**

<b>Recovery experiences of adults with moderate and major trauma after discharge from the acute care setting: a qualitative systematic review</b>				
Population: adults with moderate or major traumatic injuries				
Phenomena of interest: experiences and perspectives of the recovery process				
Context: after discharge from acute care setting to an unsupervised community setting				
<b>Synthesized finding</b>	<b>Type of research</b>	<b>Dependability &amp; Credibility</b>	<b>ConQual score</b>	<b>Comments</b>
<b>1. Recovery experiences are highly individual and influenced by a range of intrapersonal factors.</b> Adults with major and moderate traumatic injuries describe their personal role in the recovery process, grief and loss of control of their current situation, uncertainty about the recovery process and future ability and opportunities, concerns about aging, and perceived dependence and burden on others.	Qualitative	<b>Dependability:</b> High (No downgrading)  <b>Credibility:</b> Moderate (Downgrade one level**)	<b>Moderate</b> – downgraded 1 level due to moderate credibility	<b>Dependability:</b> 29/35 findings came from reports with high dependability as they scored 4-5 “yes” responses for the questions relating to appropriateness of the conduct of the research.  <b>Credibility:</b> Downgraded one level due to mix of unequivocal (30) and credible (5) findings.
<b>2. Enduring physical and psychological consequences impact on recovery experiences following traumatic injuries.</b> Adults with major and moderate traumatic injuries experience ongoing physical and psychological issues post-injury, requiring individuals to adapt their physical and occupational activities during recovery.	Qualitative	<b>Dependability:</b> High (No downgrading)  <b>Credibility:</b> Moderate (Downgrade one level**)	<b>Moderate</b> – downgraded 1 level due to moderate credibility	<b>Dependability:</b> 22/26 findings came from reports with high dependability as they scored 4-5 “yes” responses for the questions relating to appropriateness of the conduct of the research.  <b>Credibility:</b> Downgraded one level due to mix of unequivocal (19) and credible (7) findings.
<b>3. Adults recovering from major and moderate traumatic injuries access a range of health and care services, as well as social support, during recovery.</b> While these supports are valued, barriers to engaging with services and social support exist.	Qualitative	<b>Dependability:</b> Moderate (Downgrade one level*)  <b>Credibility:</b> Moderate (Downgrade one level**)	<b>Low</b> – downgraded 2 levels due to moderate dependability and moderate credibility	<b>Dependability:</b> 3/7 findings came from reports with moderate dependability as they scored 3/5 “yes” responses for the questions relating to appropriateness of the conduct of the research.  <b>Credibility:</b> Downgraded one level due to mix of unequivocal (4) and credible (3) findings.
<b>4. Patient – healthcare professional communication and information provision are valued by adults recovering from major and moderate trauma.</b> Adults with major and moderate traumatic injuries seek out recovery-related information from a variety of healthcare providers and value the use of accessible language.	Qualitative	<b>Dependability:</b> Moderate (Downgrade one level*)  <b>Credibility:</b> Moderate (Downgrade one level**)	<b>Low</b> – downgraded 2 levels due to moderate dependability and moderate credibility	<b>Dependability:</b> 11/14 findings came from reports with moderate dependability as they scored 3/5 “yes” responses for the questions relating to appropriateness of the conduct of the research.  <b>Credibility:</b> Downgraded one level due to mix of unequivocal (10) and credible (4) findings.
U: unequivocal; C: credible *Downgraded 1 level due to the common dependability issues across the included primary studies (locating researcher, acknowledging influence of researcher) **Downgraded 1 level due to a mix of unequivocal and credible findings.				

## 2.8 Discussion

This qualitative systematic review aimed to synthesise the recent evidence available on the topic of adults' recovery experiences after traumatic injuries. As seen in the wide range of topics identified in the findings, recovery experiences are complex and involve many intrapersonal and interpersonal factors that influence individuals' recovery experiences. The qualitative evidence synthesised in this review is relevant for all involved in the trauma pathway, whether directly involved in patient care during recovery (i.e. trauma-specific healthcare professionals, community health and care providers) and other stakeholders including those involved in designing trauma care services, policymakers, researchers, and service auditors.

This review aimed to identify studies that took place in countries comparable to the UK with "very high" HDI (United Nations Development Programme 2020), so the synthesised findings only reflect the experiences of individuals in these countries. The generalisability of the review findings to HDI countries should be considered as the review only represents evidence from three countries (i.e. Australia, United Kingdom, Canada) and most of the reports (8/13) recruited participants from one trauma registry (i.e. Victoria State Trauma Registry (VSTR)) with many participants (82%) from one setting (i.e. Victoria, Australia). As patients' recovery experiences depend on many factors including cultural aspects, healthcare systems, and local service opportunities, future research from a wide range of countries and healthcare settings would provide a fuller picture of current recovery experiences of adults after moderate and major traumatic injuries.

With ongoing improvements in pre-hospital and acute trauma care reducing patient mortality rates, the focus is now on the long-term outcomes of patients (Salim et al. 2023). Of the included reports in the review, the time of participant interviews ranged from five weeks after discharge from hospital to nine years post-injury, demonstrating the importance of documenting experiences at different stages of recovery. During the months to years following a traumatic injury, patients report reduced health-related quality of life compared to the general population (Lotfalla et al. 2023). Ongoing issues reported up to two years post-injury for adults with major trauma include persistent pain, functional deficits, mental and socioeconomic deficits (Kaske et al. 2014). Participants' ability to participate in physical activities is affected, with participants reporting significant persistent restrictions to physical activities up to five years post-injury. A recent systematic review found that after serious orthopaedic injuries, adults and adolescents did not meet the current physical activity guidelines (i.e. 150 minutes of moderate-intensity exercise each week) up to two years post-injury and demonstrated high levels of sedentary behaviours throughout the recovery process (Ekegren et al. 2018). Enabling patients to engage in physical activities could be facilitated by allied health professionals such as

physiotherapists and occupational therapists or other exercise professionals (e.g. certified personal trainers). One of the included reports noted that none of the major trauma participants were receiving input from allied health professionals at three years post-injury (Reeder et al. 2021). Future research in this area would look to identify if there is unmet need in local areas with what services are offered, as well as further research into the benefits and feasibility of ongoing supervised rehabilitation in the community, in the form of modified sports or supervised gym sessions, as suggested by the participants in Ekegren et al. (2020).

Alongside the physical challenges, many participants described the significant emotional impact of the injury and psychological challenges experienced post-injury. Stress and anxiety were often mentioned when participants described their perceived loss of control and uncertainty about recovery and the future. The prevalence of psychological challenges following traumatic injuries is identified in the literature (van der Sluis et al. 1998). Following traumatic injuries, individuals are at risk of developing anxiety, depression, and PTSD affecting patients' HRQoL (Silverstein, Higgins and Henderson 2021) from psychological reactions and emotional distress related to the injury event (Finstad et al. 2021).

To manage psychological challenges, participants reported using different coping strategies like making short-term plans and controlling their frustration, and also described constructive behaviours like using social connections for support and seeking recovery-related information from healthcare professionals. Healthcare providers can assist this aspect of the recovery process by providing self-management support interventions. A recent systematic review of self-management support strategies identified that self-management support provided by primary healthcare providers has a positive impact on clinical and humanistic outcomes in patients with chronic conditions (Dineen-Griffin et al. 2019). The use of self-management support in the major traumatic injuries population is being implemented by the London Trauma System with the creation of two resources: the free *AfterTrauma* digital recovery tool for patients and the *Bridges to recovery after trauma* multidisciplinary training for trauma staff on self-management support after major trauma (Centre for Trauma Sciences 2023). The wide range of intrapersonal factors of individual recovery experiences described in this review support the use of self-management support for individuals throughout rehabilitation and recovery.

Adults with major and moderate traumatic injuries reported that an important aspect of self-management of their condition was information provision and communication with healthcare providers. Information and communication with healthcare professionals is valued by adults with moderate and major traumatic injuries, but the continuity of information provided across healthcare

professions and settings was reported as a challenge by some participants (Braaf et al. 2018). Participants perceived the healthcare professionals to be in charge of the communication after discharge from an acute setting and when this was not done satisfactorily, participants reported negative impacts on their health and recovery (Braaf et al. 2018). A solution suggested by participants of Braaf et al. (2018) to improve continuity of communication was to have a single point of communication for patient and healthcare professionals. This role, often referred to as a 'trauma coordinator' or 'key worker', is included in the NICE guidelines for major trauma service delivery with the responsibility to "coordinate the patient pathway and to act a single point of contact for clinicians, patients and carers" (National Clinical Guideline Centre (UK) 2016).

A lack of information was identified as a challenge after leaving hospital. The timing of information provision was viewed to impact on the individuals' recovery, as well as receiving conflicting information or use of medical jargon. There is a body of evidence suggesting that there is a lack of information for patients with traumatic injuries experiences on discharge from acute care, which can impact on the patients' understanding and confidence to manage their recovery (Kellezi et al. 2015; Kimmel et al. 2016; Goldsmith, McCloughen and Curtis 2018; Gotlib Conn et al. 2018; Finstad et al. 2021; Collins et al. 2022; Olive et al. 2022; Gran and Nilsson 2023). Other studies identified that there may be barriers to information provision for patients, including the consideration of health literacy and timing, as patients can be impacted by factors such as cognitive impairment, use of analgesia, and stress that impact on retention of information (Kimmel et al. 2016; Gotlib Conn et al. 2018). Suggestions for improving information provision from the included studies included providing written information, as well as improved communication as mentioned previously (Braaf et al. 2018).

Participants described the physical and emotional benefits of having social connections and support throughout recovery, which is found in other studies in the traumatic injury population (Slaney et al. 2014; Brand et al. 2018; Brown et al. 2020). This ranged from family support with the emotional burden and practical aspects of recovery (i.e. transportation) to support from co-workers when returning to work. The importance of social support has led to research on experiences of injured individuals' close connections. There is evidence for caregiver burden in neurological traumatic injury populations (Manskow et al. 2015; Charlifue et al. 2016; Lieshout et al. 2020), but limited in the non-neurological traumatic injury population. Several studies look at the experiences of caregivers during acute care (Linnarsson, Bubini and Perseus 2010; Newcomb and Hymes 2017), and two others explored outcomes and experiences of caregivers after discharge from hospital (Heathcote et al. 2021; Hudson, Radford and Kettlewell 2022). Heathcote et al. found that caregivers of adults with severe traumatic musculoskeletal injuries experienced decreases in their resilience, mental health, physical activity levels, and perceived community support in the three months after hospital

discharge (2021). The caregiving role had a psychological impact on the carers, as well as a financial and employment impact, and carers reported a lack of support from professional services (Hudson, Radford and Kettlewell 2022). Further research and service planning should consider the impact of the injury on the close connections of individuals with non-neurological traumatic injuries and how to best support them throughout the patient's recovery.

This review described that adults with major and moderate traumatic injuries accessed health and care services to aid their rehabilitation and recovery. Several of the barriers were identified in this review related to accessing health services, mainly financial and accessibility issues. This evidence is from an Australian context, where there are several health and support services to assist injured people such as Medicare, aged care system, National Disability Insurance Scheme, third-party injury insurers, or private health insurance (Reeder et al. 2021). These barriers may be context-specific to the health care system and local services available in the reports, so possibly not generalisable to other healthcare systems. This indicates the need for future research in local regions, to identify how rehabilitation services are accessed in the local context. In the UK, a study mapped the rehabilitation needs of trauma survivors found that there was a lack of communication between acute and community services as well as gaps and geographical barriers in current service provisions for musculoskeletal injuries (Kettlewell et al. 2021). An area of future research would be evaluating access-to-care in local contexts using a measure, like that suggested by Levesque et al. (2013).

### 2.8.1 Strengths and Limitations

A strength of this review was the use of rigorous JBI methodology. This review had an *a priori* protocol developed by the researcher, who had training in the JBI methodology. The researcher had guidance from a multidisciplinary supervisory team, including JBI methodology experts and clinical experts. The size of the supervisory team allowed for independent double-screening at both the title and abstract and full text screening stages, minimising the chance of possible human error/bias during the screening phases. A comprehensive search strategy was created and conducted with assistance from a research support librarian to optimise the search strategy for each information source. Clinical experts and related systematic reviews were used to create a comprehensive list of terms used to identify "major and moderate traumatic injuries". The comprehensive search strategy was specialised for qualitative literature, searching multiple sources of grey literature, and reference checking and citation checking included studies. It is possible that some reports using different terminology for traumatic injuries may not have been discovered, but we are confident that the search strategy was comprehensive as 2,911 unique records were identified.



One concern identified was the reporting of methodology of the included reports. Only one report clearly stated the philosophical perspective (Conn et al. 2023), meaning most reports included were unclear on whether there was congruity between the philosophical perspective and research methodology used. Similarly, only two reports clearly stated the research methodology used (Ogilvie et al. 2015; Conn et al. 2023). This was managed by using the assumption that the studies were conducted using descriptive qualitative methodology, as this is a common methodology used in qualitative healthcare research (Doyle et al. 2020). The lack of clarity in methodology should be addressed in future qualitative research in this area to ensure high-quality work in this field.

Over half of the studies did not include a statement locating the researcher culturally and theoretically and five reports did not report on the influence of the researcher on the research, which impacted on the dependability of the synthesised findings. This highlights the need for improved reporting of the researcher's influence on the qualitative research process, especially in healthcare-related research.

Due to the heterogeneity of traumatic injuries and the variable reporting methods and quality, the final study selection was challenging and required several meetings with clinical experts. To be sure that the participant populations were accurate, only studies that explicitly stated the ISS or provided this information when requested from authors were included. There were several studies excluded at full text because the demographics of the study population were unclear (APPENDIX D). This means that some possibly relevant studies may have been excluded due to unclear reporting of participant demographics, but the research team attempted to include all relevant reports by accessing supplementary material and contacting authors for clarification.

## **2.9 Conclusion**

There is a growing body of qualitative evidence on the recovery experiences of adults with traumatic injuries. This qualitative systematic review was conducted using JBI methodology and identified four synthesised findings, indicating that individuals' recovery experiences are impacted by intrapersonal factors and challenges, the presence of enduring physical and psychological issues impact on activities and occupational pursuits, and that adults with moderate and major traumatic injuries value of access to social support and services and communication and information from HCPs. The reports in this review represented three countries, so application of review findings to contexts outwith these countries should be considered. Reporting of research methodology and the researcher's influence on research was variable across the included reports and should be addressed in future research in this area.

### 2.9.1 Recommendations for Clinical Practice

The synthesised findings in this review provide evidence for the range of topics that are related to the recovery journey for adults with major and moderate traumatic injuries. This evidence could be used to inform practice and for this, the strength of the recommendations is assessed and reported.

This review used the JBI Grades of Recommendation, indicating the strength of proposed recommendations with two levels, Grade A or Grade B (Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party 2013). Grade A indicates a 'strong' recommendation, where "(1) it is clear that desirable effects outweigh undesirable effects of the strategy; (2) where there is evidence of adequate quality supporting its use; (3) there is a benefit or no impact on resource use, and (4) values, preferences and the patient experience have been taken into account" (Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party 2013 p. 1). Grade B, 'weak' recommendations indicate that "(1) desirable effects appear to outweigh undesirable effects of the strategy, although this is not as clear; (2) where there is evidence supporting its use, although this may not be of high quality; (3) there is a benefit, no impact or minimal impact on resource use, and (4) values, preferences and the patient experience may or may not have been taken into account" (Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party 2013 p. 1). The following four recommendations have been assessed to be Grade B 'weak' recommendations, as the evidence for the synthesised findings included a mix of credible and unequivocal findings, scoring moderate to low ConQual scores, and because the research came from a limited range of countries and a number of the reports had moderate dependability due to a lack of methodological reporting.

These practice recommendations relate to each of the synthesised findings and highlight aspects related to patient's experiences following a traumatic injury that healthcare professionals should consider. This recommendations for clinical practice are as follows:

- i. Health care professionals should be aware that recovery experiences of adults with moderate and major traumatic injuries are varied and influenced by many intrapersonal factors, which should be considered when providing care at all stages of recovery. (Grade B)
- ii. Health care professionals should be aware of the impact enduring physical and psychological consequences have on physical, psychological, and occupational aspects of individuals' lives and consider ways to address these when providing care to adults with major and moderate traumatic injuries throughout their recovery. (Grade B)

- iii. Health care professionals should consider ways to facilitate access to required services to support adults with major and moderate traumatic injuries throughout their recovery. (Grade B)
- iv. Health care professionals should be aware of the importance of accessible, consistent information and communication when providing care at all stages of recovery. (Grade B)

### 2.9.2 Recommendations for Research

As this review was a comprehensive summary of the current qualitative literature on the recovery experiences of adults after traumatic injuries, considerations for future research and areas where further research is warranted were identified. These include:

- i. Further qualitative research into regional experiences of recovery for adults with major and moderate traumatic injuries.
- ii. Development of a consensus on the use of traumatic injury terms and standardised reporting of participant demographics for traumatic injury population to aid evidence synthesis research.
- iii. Ensuring rigorous reporting of qualitative methodology in applied research studies (i.e. COREQ).
- iv. Development and use of trauma registries for research purposes to enable evaluation of long-term outcomes and recovery experiences of traumatic injury populations (e.g. similar to VSTR).

### 2.10 Need for Primary Study

As mentioned in the recommendations for research (Section 2.9.2), there is a need for additional qualitative research on the recovery experiences of adults with major and moderate traumatic injuries in different contexts. The primary study aimed to address this need by exploring the experiences of adults after traumatic injuries in the North of Scotland, as no previous research on adults with traumatic injuries in Scotland was identified in the systematic review. The next chapter outlines the methodology and methods used to conduct the primary research study.

## CHAPTER 3: METHODOLOGY AND METHODS

### 3.1 Introduction

Following from the systematic review of the current qualitative literature, a lack of knowledge of recovery experiences for adults with major and moderate traumatic injuries in the Scottish context was identified. The study aim for the primary research was developed from discussions with NoS MTN clinicians (Chapter 1, section 1.8.1) and from the findings of the qualitative systematic review (Chapter 2). Starting with the research aims and objectives, this chapter discusses the researcher's worldview, followed by the philosophy, methodology, and methods used to conduct this research. The use of the biopsychosocial model and the International Classification of Functioning, Disability, And Health Framework (ICF) are discussed, as well as ethical considerations and approvals received prior to conducting this research. The chapter will finish with the study methods and the steps taken to ensure rigour and trustworthiness, including researcher reflexivity.

### 3.2 Research Aim and Objectives

The principal research aim was to explore the recovery experiences of adults with major and moderate non-neurological traumatic injuries after leaving the acute care setting.

The main objectives were to:

1. Explore the experiences and perspectives of adults with major and moderate trauma regarding recovery and rehabilitation, including use of local rehabilitation services, ongoing limitations and rehabilitation needs, and return to work and leisure activities.
2. Collate findings of participant experiences and recommendations for local clinical practice and future research areas into a report to inform local trauma service<sup>1</sup>.

### 3.3 Approach to Research

#### 3.3.1 Research Study Design

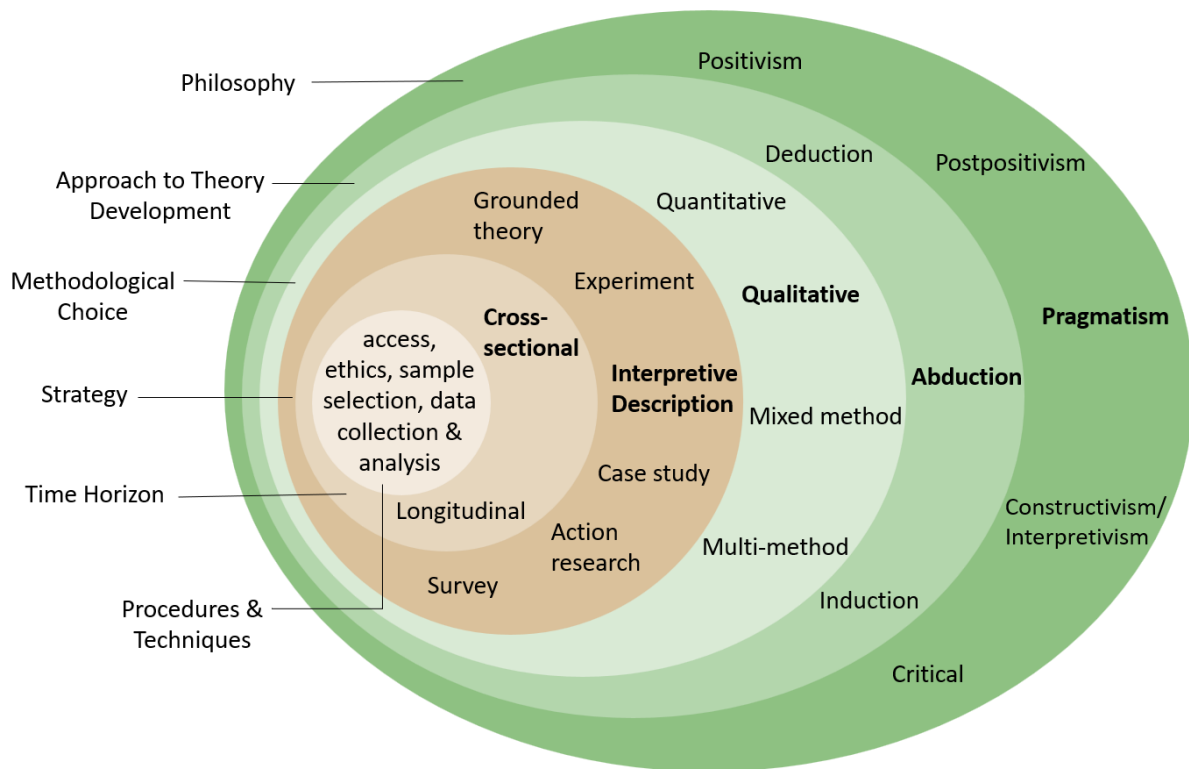
As with all research, there are multiple ways that real-world observations and questions can be developed into research questions and aims and subsequently investigated or explored. As such,

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<sup>1</sup> Report to be developed following Viva

there were multiple decisions concerning the scope and direction of the research that formed the study design to answer the research aim described above.

To facilitate this planning, the model of the “research onion”, coined by Saunders in 2007, was considered (Saunders, Lewis and Thornhill 2007). The original onion model has been updated multiple times since the first version, with Figure 8 showing an adapted version of the latest version (Saunders, Lewis and Thornhill 2023). This visual displays how the different aspects of research study design can be seen as layers, starting with philosophy on the outermost layer, then working inwards in a step-ways fashion to arrive at corresponding research procedures and techniques to achieve the research aims (Saunders, Lewis and Thornhill 2023). The following sections will describe and define the options available at each level of the research onion and provide justification for the study design used for this research. Before delving into the research onion, the researcher’s worldview has been included to consider in context of the research design components.



**Figure 8 - Research ‘Onion’,** adapted from (Saunders, Lewis and Thornhill 2023)

### 3.3.2 Researcher's Worldview

I am a recently-qualified physiotherapist and doctoral research student. Prior to this research, I had research experience with both quantitative and qualitative research approaches, including experience with interview techniques. I currently work as a physiotherapist in multiple roles and have reflected on this throughout the thesis, as I am aware that my preconceptions and prior knowledge can influence how I conduct and relate with the research.

I am originally from the United States and have lived in Scotland for around five years, in which time I have become familiar with the NHS and healthcare in the UK context. I was not involved in any clinical care with patients within the NoS MTC or MTN before or during data collection and had minimal prior clinical experience in the trauma care field, with my knowledge on the topic coming from speaking to NoS MTN clinicians, reading trauma care and rehabilitation literature, and physiotherapy student placements around Scotland.

I identify my worldview to be pragmatic, as I believe there are multiple ways to explore relevant topics and questions, especially in the context of healthcare and that the best methodologies are the ones that best fit the purposes and aims of the research. I have reflected on the impact that having a pragmatic worldview brings to this research, detailed in the Findings chapter (Section 4.9 - Reflexive Practice in Action).

### 3.3.3 Philosophy: Pragmatism

Research philosophy is “a system of beliefs and assumptions about the development of knowledge” (Saunders, Lewis and Thornhill 2023 p. 132). Other terms used to describe philosophy are “worldview” or “paradigm”, which both refer to the beliefs or assumptions that guide the decisions and actions that a researcher makes (Creswell and Creswell 2018). This section will use the term “philosophy” throughout to maintain continuity.

All researchers bring with them individual assumptions and beliefs and it is important to acknowledge these at the start, as these will influence the choices and decisions throughout the research process (Saunders, Lewis and Thornhill 2023). This section will briefly introduce the common research philosophies (see Table 16) and then focus on pragmatism as the chosen research philosophy and provide justification for this choice.

### 3.3.3.1 Common Research Philosophies

There are multiple research philosophies widely recognised and used in research, which are detailed in Table 16. Research philosophies can be characterised by considering four elements: ontology, epistemology, axiology, and methodology. The definitions of these elements are described here:

- **Ontology** looks to clarify the researcher’s “assumptions about the nature of reality” (Saunders, Lewis and Thornhill 2023 p. 134). It asks the broad question of, “What is the nature of the “knowable”? Or, what is the nature of “reality”?” (Guba 1990 p. 18). Ontological perspectives have developed from the initial positivist view of *realism* - knowledge and reality as existing ‘out there’, following natural laws and able to be objectively observed by researchers, to the other end of the spectrum with the constructivist view of *relativism* – that multiple realities exist and are developed by interactions between individuals (Guba 1990). There are variations of these two examples given, such as *critical realist* in post-positivism, which have developed as research philosophies and methodologies have evolved over time.
- **Epistemology** refers to the “methods, limits, and nature of human knowledge” (Patterson and Williams 1998 p. 289). In relation to philosophy, epistemology questions, “What is the nature of the relationship between the knower (the inquirer) and the known (or knowable)?” (Guba 1990 p. 18). Similar to ontology, epistemological positions also occur on a continuum. On one end is the objective view, *objectivist* as seen in positivism, where the researcher views themselves as separate from what they are researching. On the opposite side, *subjectivist* is held by those using critical and constructivism philosophies, is where the researcher views themselves as having an active role in the creation and interpretation of findings. There are also variations, such as *modified objectivist*, that is seen in post-positivism.
- **Axiology** can be defined as “the role of values and ethics in the research process” (Saunders, Lewis and Thornhill 2023 p. 135). While historically, ontology and epistemology were widely considered when discussing research philosophy, axiology was added as an additional consideration by Laudan’s model in 1984, with the aim of allowing one to evaluate a paradigm and the research conducted using that paradigm for internal consistency (Patterson and Williams 1998). With axiology, the researcher considers how their own views and values may impact on the research (Saunders, Lewis and Thornhill 2023), as well as considering how to respect the rights of participants, follow ethical principles, and minimise or reduce risk during research (Alele and Malau-Aduli 2023b).

- **Methodology** is referred to the actions that are used by the researcher - “How should the inquirer go about finding out knowledge?” (Guba 1990 p. 18). Methodology is dependent on the answers to the above considerations and forms the action plan for the study design, methods, and procedures and techniques (Alele and Malau-Aduli 2023b). Common methodological approaches include quantitative and qualitative approaches, as well as use of multiple or mixed methods, depending on the research question and philosophical perspectives of the researcher (Alele and Malau-Aduli 2023b).

### 3.3.3.2 Justification for Pragmatist Philosophy

A pragmatism approach was chosen for this research because of the applied nature of the research aim and congruency of this philosophy and the researcher’s worldview. Pragmatism is unlike many of the other philosophies listed in Table 16, in that it does not specify explicit approaches or methodologies to use; instead, it allows the researcher to focus on the research questions and use the approaches and method(s) that best answer the research question (Creswell and Creswell 2018). The research topic of people’s experiences after a traumatic injury could be explored in several ways and thus, the research study could have used different methodology and methods depending on the main focus of the research.

The aim of the research was identified to be the recovery and rehabilitation experiences of adults with major and moderate traumatic injuries (Section 1.8.1). Approaching this research with a pragmatic philosophy allowed the researcher to consider the options available to best explore the research aim and adopt the appropriate methodological practices.

Using a pragmatist philosophy, the researcher considered each element of the philosophy (see Section 3.3.3.1). For ontology, a *relativist* perspective was used as this matched the qualitative nature of the research question, that there are multiple realities that depend on the person who holds them (Guba 1990). For epistemology, a *subjectivist* view was used and this fit with the relativist ontological position as the data is seen to be created through the interaction of the researcher and participant (Guba 1990). The axiological position used is *value-driven research*, meaning the value of the research is in how well it answers the research question and the focus of the research is meaningful (Saunders, Lewis and Thornhill 2023). As the research is qualitative by nature, the importance of reflexivity is also acknowledged as the researcher has an active role in the research process (Saunders, Lewis and Thornhill 2023).



**Table 16 – Common Research Philosophies**, definitions from (1. Guba 1990; 3. Alele and Malau-Aduli 2023b; 2. Saunders, Lewis and Thornhill 2023)

<b>Philosophy</b>	<b>Ontology</b>	<b>Epistemology</b>	<b>Axiology</b>	<b>Methodology</b>
<b>Positivism</b>	<i>Realist</i> – reality exists “out there” driven by immutable natural laws and mechanisms (1)	<i>Dual/objectivist</i> – inquirer observes from distant, noninteractive view (1)	<i>Value-free</i> – researcher independent from data, objective stance (2)	<i>Experimental/manipulative</i> – use of hypotheses, empirical tests, carefully controlled conditions (1)
<b>Post-positivism</b>	<i>Critical realist</i> – reality exists but can never be fully apprehended (1)	<i>Modified objectivist</i> – objectivity is regulatory ideal, but can only be approximated (1)	<i>Value-free</i> – (similar as positivism)	<i>Modified experimental/manipulative</i> – critical multiplism, inquiry occurs in more natural settings, use of qualitative methods, added in discovery focus (not only verification) (1)
<b>Critical Theory (Transformative)</b>	<i>Critical realist</i> – reality exists but can never be fully apprehended (1)	<i>Subjectivist</i> – values mediate inquiry (1), knowledge shaped by power dynamics & social structures (3)	<i>Value-laden</i> – researcher influences research design and interpretation of findings (1)	<i>Dialogic, transformative</i> – eliminate false consciousness, facilitate transformation (1)
<b>Constructivism (Interpretive)</b>	<i>Relativist</i> – multiple mental constructions (realities), dependent on the persons who hold them (1)	<i>Subjectivist</i> – researcher and researched create findings through interaction (1)	<i>Value-bound</i> – researcher part of what is being researched, researcher reflexivity to be included (2)	<i>Hermeneutic, dialectic</i> – individual constructions created and refined hermeneutically, compared dialectically, aim of generating constructions (1)
<b>Pragmatism</b>	<i>Multiple options</i> – ‘reality’ is practical consequences of ideas (2)	<i>Multiple options</i> – Practical meaning of knowledge in specific contexts, focus on problems, practices, and relevance (2)	<i>Value-driven</i> – values used for interpreting results, researcher can adopt objective & subjective viewpoints, researcher reflexivity to be included (2)	<i>Mono, mixed, or multiple methods</i> - practical applied research aims determine methods, use of qualitative & quantitative methods (2)

As this research used mono-method qualitative methods, it is worth clarifying why a pragmatic philosophy was used over an interpretive philosophy. This research topic is applied as it was developed in partnership with the NoS MTN and the findings are relevant to the local MTN service in this local context. Applied research can be defined as “original investigation undertaken in order to acquire new knowledge... directed primarily towards a specific, practical aim or objective” (National Science Foundation 2018 p. 2). The practical nature of this research best suited the use of a pragmatic philosophy as this enabled the researcher to consider all options regarding philosophy and methodology to best explore the research aim. When qualitative methodology was selected as the best fit to meet the research aims, the researcher identified that the research was still applied in nature, as it was not aiming for a, “‘pure’ description, but rather... to discover associations, relationships, and patterns within the phenomenon that has been described” (Thorne 2016 p. 56). As the aim did not fit with the common ‘pure’ qualitative methodology aims (e.g. phenomenology, grounded theory, ethnography), a pragmatic philosophy best fit the applied nature of the research topic.

#### 3.3.4 Approach to Theory Development: Abductive

The next layer of the Research Onion is the approach to theory development, otherwise known as epistemology. Epistemology can be defined as “the ways knowledge about reality is acquired, understood, and utilised” (Alele and Malau-Aduli 2023b p. 2). Part of epistemology involves being critical about what knowledge is, as this influences the researcher’s confidence in the data and findings.

There are two main epistemological positions: inductive and deductive logic. For *deductive* logic, the researcher starts with a question or theory and then tests this against observations, or a “top-down” process (Ritchie et al. 2014a). Deductive logic is commonly used with positivist research approaches, starting with a theory or hypothesis and using research strategies to test this hypothesis (Saunders, Lewis and Thornhill 2023). *Inductive* logic is where the observations are used to build knowledge and theories, or a “bottom-up” process (Ritchie et al. 2014a). This is commonly used with constructivist/interpretive philosophy, where evidence is collected to create a theory or explore a phenomenon (Saunders, Lewis and Thornhill 2023).

There is also a third option, *abductive* logic, referring to “‘abducting’ a technical account, using the researchers’ categories, from participants’ own accounts of everyday activities, ideas or beliefs” (Ritchie et al. 2014a p. 7). Abduction can be used in qualitative research to account for the fact that there can be elements of both inductive and deductive logic used, with the participant’s language

being used as first-order concepts and this then ‘abducted’ into the researcher’s categories at the second-order level (Ritchie et al. 2014a). Abductive logic can be used when specific topics are identified within the research aims, but also allows for the discovery of unexpected aspects in the data (Gale et al. 2013).

This research used an abductive approach to theory development. At the start of the research, the NoS MTC clinicians identified areas of clinical interest for the research to cover, which informed the development of the interview guide. As this research was exploratory in nature, during early data collection and analysis, an inductive approach was used, where the data was managed, keeping the participant’s language as much as possible. Then in the later stages of data analysis, the ICF framework (see section 3.4.2) was used as a lens for considering the higher-order classifications. This abductive approach fit with the pragmatic philosophy and the applied aim of the research, while maintaining the clear connection between the participants’ experiences and the findings.

### 3.3.5 Methodological Choice: Mono-Method Qualitative

Next was the decision on the methodological choice for how to best achieve the research aim. The main categories include a quantitative approach (collection and analysis of numeric data), qualitative approach (collection and analysis of non-numeric data), or mixed or multi-methods (combination of numeric and non-numeric data) (Saunders, Lewis and Thornhill 2023).

As mentioned in Section 1.8.1, the main clinical questions related to patients’ experiences after leaving the hospital. The qualitative systematic review in Chapter 2 identified that there was a lack of qualitative evidence in the traumatic injury population in the Scottish context. Qualitative research provides knowledge on human experiences, and is used to explore and explain many questions in the healthcare setting (Lockwood et al. 2020). In the healthcare setting,

*“Qualitative research plays a significant role in understanding how individuals and communities perceive health, manage their own health and make decisions related to health service usage. It can assist to understand the culture of communities, in relation to implementing changes and overcoming barriers.”*

*(Lockwood et al. 2020 p. 24)*

Use of a mono-method qualitative methodological approach was in keeping with the research aim of exploring participants’ recovery experiences in the North of Scotland and maintaining the applied research context.

### 3.3.6 Methodological Strategy: Interpretive Description

At the strategy level of the research onion, the decisions start to move from the theoretical realm to the more practical, beginning to shape the methods of how the research will be carried out (Saunders, Lewis and Thornhill 2023). The following sections will outline some common methodological strategies and provide justification for the choice of Interpretive Description.

#### 3.3.6.1 Common Methodological Strategies

Table 17 lists and describes some of the common qualitative and quantitative research strategies. As the previous Research Onion layer identified that this research was mono-method qualitative, Table 17 focuses mainly on qualitative research strategies.

**Table 17 - Common Research Strategies**, from (3. Ritchie et al. 2014a p. 19; 2. Thorne 2016 p. 83; 1. Creswell and Creswell 2018 pp. 12–14; 4. Saunders, Lewis and Thornhill 2023 p. 205)

<b>Qualitative research strategies</b>	
<i>Phenomenology</i> – describe lived experiences of individuals about a phenomena as described by participant <sup>1</sup>	<i>Ethnography</i> – study of shared patterns of behaviours, language, and actions of intact cultural group in a natural setting <sup>1</sup>
<i>Narrative</i> – studies the lives of individuals, ask participant(s) to share stories about their lives <sup>1</sup>	<i>Case study</i> – develop an in-depth analysis of a case, e.g. programme, activity, process, or individual(s) <sup>1</sup> (can be quantitative)
<i>Grounded theory</i> – derive a general, abstract theory of a process, action, or interaction grounded in view of participants <sup>1</sup>	<i>Interpretive Description</i> – provides a thematic or integrative description of a phenomenon of applied or practice interest <sup>2</sup>
<b>Quantitative research strategies</b>	
<i>Experimental</i> – determine if a specific treatment influences an outcome <sup>1</sup>	<i>Survey</i> – quantitative description of trends, attitudes, or opinions of a population by studying a sample of population <sup>1</sup>
<b>Other research strategies</b>	
<i>Action research</i> – collaborative approach with participants, aimed to enact positive change for all involved <sup>3</sup>	<i>Archival research</i> – uses manuscripts, documents, administrative records, objects, sound and audio-visual materials as source of data <sup>4</sup>

Initially, phenomenology was considered as a possible qualitative research strategy, which aims to “[describe] the lived experiences of individuals about a phenomena as described by participant” (Creswell and Creswell 2018 p. 13) While this aim is similar to the aim of the study, it differs slightly in regards to the context and specific aim. The applied nature of this research topic required the researcher to understand and empathise with the participants’ experiences, but then also use the findings to inform clinical practice in the local region and future research (Thorne 2016). While phenomenology aims to “[describe] the meaning people attach to a particular phenomenon” (Ritchie et al. 2014a p. 13), this research was not looking to understand the in-depth meaning of the recovery journey, but instead looking to gather and synthesis participants’ experiences and then use them to inform local services and practice. As such, the applied nature of the research did not fit a phenomenological approach.

#### *3.3.6.2 Justification for Interpretive Description*

Interpretive Description (ID) is a methodological framework published by Sally Thorne that aims to “provide a thematic or integrative description of a phenomenon of applied or practice interest, and do so in a manner in which the disciplinary objects of the study are made explicit within the interpretations” (Thorne 2016 p. 83). Thorne created the ID framework as an approach to bring transparency and credibility to the applied qualitative research that was already occurring in healthcare settings (Thorne 2016). This methodological framework best suits research questions that have “an inductively derived description of a phenomenon, and one that deserves an interpretive lens” (Thorne 2016 p. 53), but instead of the historically ‘pure’ qualitative methods that aim to know the essence of a phenomenon (i.e. phenomenology), ID seeks to understand the phenomena and take the research a step further by using it to answer real-world questions.

This research was developed in collaboration with the NoS MTN and is applied in nature, as it aims to have the findings relevant to local services and inform the NoS MTN clinicians of patient’s experiences. As it is more in-depth than a simple descriptive qualitative study, ID was seen to suit the aims and context of this research.

#### *3.3.7 Time Horizon: Cross-sectional*

Time horizon refers to the timeframe in which the research will take place, with a *cross-sectional* approach taking a single ‘snapshot’ of the phenomena of interest at one time point and a *longitudinal* approach having a continuous view of a phenomena over time (Saunders, Lewis and

Thornhill 2023). This research utilised a cross-sectional approach, mainly due to the exploratory nature as well as logistical considerations.

First, this research was exploratory as it “explores or clarifies understanding of an issue, problem, or phenomenon” (Saunders, Lewis and Thornhill 2023 p. 179). This is the first research on recovery experiences of adults with major and moderate traumatic injuries in the North of Scotland. As this context and population are not represented in the literature, this smaller-scale exploratory study aims to explore the experiences of this population and can be used to inform future research.

The logistical considerations included the thesis timeline and the accessibility of STAG data. The thesis timeline was 18 months, so in the preparation phase, the researcher identified that it would not be feasible to collect data at multiple timepoints. Another initial idea was incorporating the prior outcome measures that the participants would have already completed for STAG (i.e. EQ-5D). Use of the EQ-5D data from discharge from hospital and comparing it to their current EQ-5D scores would have incorporated a longitudinal aspect, but was not feasible as access to this data required approval from the Public Benefit and Privacy Panel, which was not possible within the project timeline.

Due to the exploratory nature of the research and logistical considerations, a cross-sectional approach was used for the research study as it suited the aim of the research, which was to explore the recovery experiences of participants from discharge from hospital up until the time of the interview.

### 3.3.8 Procedures and Techniques: Study Methods

Finally, into the centre of the Research Onion (Figure 8). This addresses the practical level of what methods were used to carry out the research, while remaining in the context of the previous five layers of the Research Onion. There are many different qualitative methods that could have been used, so the following sections will briefly detail the alternative options that were considered, then focus on the methods for data collection and analysis that were chosen and provide justification.

As a side note, the centre of the Research Onion (Figure 8) does include *ethics, sample selection, and access to participants* as study methods, but these will be covered in separate sections later on in the chapter (sections 3.5, 3.7.4, and 3.7.4, respectively).

The use of a Patient and Public Involvement (PPI) in this research was considered, but not deemed feasible. The National Institute for Health and Care Research (NIHR) published the *UK Standards for Public Involvement in Research* in 2019 which identifies six standards to measure current public

involvement in ongoing research, with the aim to improve the way research is conducted by inviting members of the public to be involved in meaningful ways throughout the research process (UK Public Involvement Standards Development Partnership 2019). Due to practical aspects such as the eighteen-month timeline and limited resources from being an unfunded project, it was not feasible to engage in formal PPI activities, but the researcher did engage with relevant stakeholders (i.e. NoS MTC clinicians) throughout the research process. PPI involvement could have been beneficial for the development of the interview guide by having input in the wording of the questions and organisation of the interview, as well as trialling the use of the timeline approach in the interviews.

#### *3.3.8.1 Data Collection: Semi-structured interviews*

In qualitative research, the two main methods for data collection are individual interviews and focus groups. For both these methods, data is generated through verbal communication and the value of this data is acknowledged by the relativist ontological position (i.e. multiple realities that depend on the person who holds them (Guba 1990)) and that participants are able to communicate their reality verbally (Ritchie et al. 2014a). Although the specific methods can vary greatly depending on the research area and aims, interviews are commonly used to generate in-depth accounts about individuals' perspectives and experiences and are suited for complex or sensitive subject matters (Ritchie et al. 2014a). This differs from focus groups, where data is generated using multiple perspectives and participant interactions to gain an understanding about research topic, which are able to explore abstract conceptual topics (Ritchie et al. 2014a).

This research utilised semi-structured interviews, also referred to as in-depth interviews. The strengths of this interview structure is that it combines a structure of set questions with the flexibility to explore topics as they came up in the interview and the interactive and generative nature of interviews where information is shared by the participant and built on throughout the interview (Ritchie et al. 2014b). Semi-structured interviews were identified as the best method of data collection because the aim of the research was to explore participants' recovery experiences in-depth and the semi-structured format enable the researcher to cover the important topics, but allows participants the opportunity to bring up other topics that they saw as relevant to their recovery experiences. Another reason why focus groups were not chosen was because the topic could have been too sensitive for some participants to feel comfortable sharing in a group setting (Ritchie et al. 2014a)

In the development of the semi-structured interviews, a timeline approach was used. Timelines are a visual representation of an individual's life history, organising events in chronological order (Berends

2011). Visual imagery is a common technique used in social and critical theory research, as a way to “provide a bridge between experience and recall” (Berends 2011 p. 2; Kolar et al. 2015). The ‘timeline technique’ is useful for situations where the participant is “recalling details about complex events that happened over a period of time” because it supports the process of remembering, as evidence suggests that memory is temporally ordered (Hope, Mullis and Gabbert 2013 p. 1). When used in conjunction with in-depth interviews, timelines can be used to facilitate the recollection of personal events and allow the opportunity to explore the significance and meaning attached to the events (Berends 2011). This method has been used in previous research on sensitive topics and with marginalised groups, as there is evidence that this method enhances participant-interviewer rapport because its interactive and allows the participant to tell able their story in a meaningful way (Berends 2011; Kolar et al. 2015).

The semi-structured interview also included the interviewer-administered EQ-5D-5L, an outcome measure that is used to capture participants’ current health related quality of life (EuroQol Group 2022) (see APPENDIX F). The EQ-5D is a recommended outcome measure to use with individuals experiencing injury-related disability at multiple time points post-injury (Van Beeck et al. 2007). The EQ-5D-5L is a validated tool that is currently used by STAG and is reported annually as one of the key performance indicators for post-acute care (Public Health Scotland 2021a). The EQ-5D-5L was included in this study to provide information on study participants’ current health status, in context of the annual STAG reports (Devlin et al. 2018; Public Health Scotland 2021a).

#### 3.3.8.2 Data Analysis: Framework analysis

Leading on from data collection, there were multiple data analysis methods that could have been used to analyse the qualitative interview data. The research aim was to explore participants’ recovery experiences in an applied practical setting, so qualitative data analysis methods that focused on theory generation (e.g. grounded theory) or the use of language and structure of conversations (e.g. discourse, conversation analysis) were not considered (Ritchie et al. 2014b). Several possible analysis methods were identified, including Interpretative Phenomenological Analysis (IPA), Reflexive Thematic Analysis (RTA), and framework analysis. These are briefly described, followed by justification for use of framework analysis.

*Interpretative Phenomenological Analysis (IPA)* is a qualitative methodology, including an analysis approach. The aim of IPA is to “explore in detail how participants are making sense of their personal and social world” (Smith and Osborn 2007 p. 53). IPA uses a phenomenological approach which explores individuals’ personal experiences from the individuals’ perspectives. This methodology



commonly uses semi-structured interviews as a data collection method and the data analysis process aims to understand the content and complexity of the data through ongoing engagement and interpretation (Smith and Osborn 2007). IPA was initially considered as an option at the start of the study, but was not used as the focus of a phenomenological approach did not align with the applied nature and research aims of the study.

*Reflexive Thematic Analysis (RTA)* is a qualitative analysis method that is included in the wider family of thematic analysis methods (Braun and Clarke 2021). As a popular qualitative method, thematic analysis is used for “identifying, analysing and reporting patterns (themes) within data” (Braun and Clarke 2006 p. 79). In RTA, themes are described as a collection of data that “[reflects] a pattern of shared meaning, organized around a core concept or idea” (Braun et al. 2019 p. 845). When using RTA, the researcher has an active role in the knowledge production process by using an open and iterative coding process, in which the codes evolve and are used to identify patterns from the dataset that relate to the research aims (Braun and Clarke 2014; Braun et al. 2019). RTA was considered as a valid option for data analysis as it is suitable and commonly used in applied healthcare research because of its flexibility and accessibility to novice researchers (Braun and Clarke 2014). Ultimately, the choice to use framework analysis over RTA was based on the researcher’s preference to use framework analysis because of its transparency and clear systematic management and display of the data.

The *Framework approach* to qualitative analysis was developed in the 1980s for national social-policy research projects (Ritchie and Lewis 2003). Framework analysis is considered to be a type of thematic analysis, and “aims to capture, portray and explain the social worlds of the people under study” (Ritchie et al. 2014b p. 279). It is distinct from other forms of thematic analysis by how the qualitative data is displayed in a matrix form, with each row displaying a single ‘case’, the columns displaying a ‘code’, and a summary of the data in the ‘cells’ of the matrix (Gale et al. 2013). This matrix format enables the researcher to display data so that participant responses are kept in context and comparisons of data can be made across all cases, but also within cases for specific codes (Gale et al. 2013). The Framework Method does not have strong ties to a singular philosophical or theoretical approach, viewed instead as a method that can be used with a range of qualitative approaches (Gale et al. 2013).

Framework analysis approach was chosen for this research because thematic analysis met the aims of exploring the research question to identify themes related to participants’ experiences and provided a systematic method for data management and display. As this research was completed

with input from multidisciplinary supervisory team, the framework display was seen to be the most transparent option for discussing and displaying the data throughout the data analysis process.

### 3.4 Theories and Frameworks

In addition to the research philosophy and theories detailed above, the biopsychosocial (BPS) model and the International Classification of Functioning, Disability, and Health (ICF) were seen as fundamental to this research and were integral to the development of the study and to the interpretation of the data.

#### 3.4.1 Biopsychosocial Model

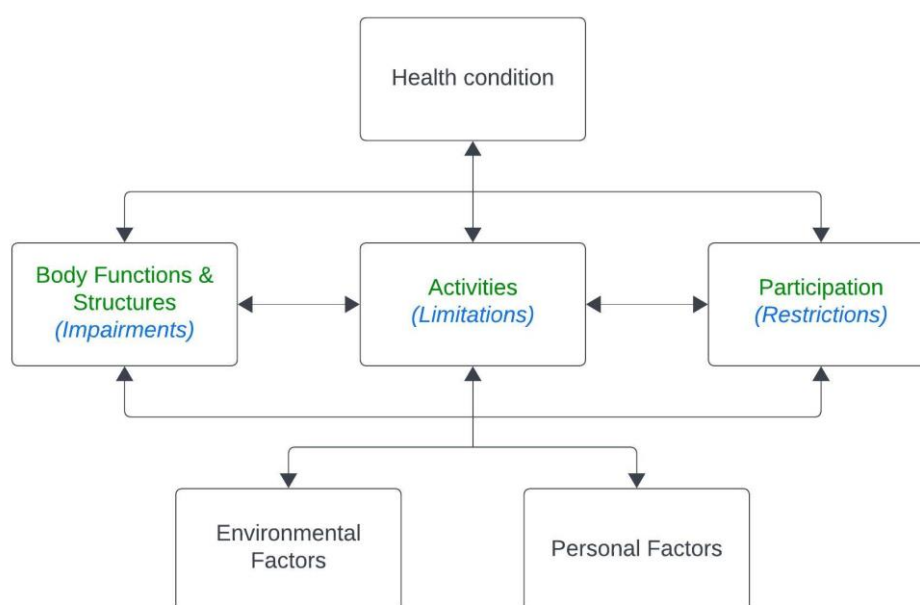
The biopsychosocial model is a philosophy of clinical care that can be described as “way of understanding how suffering, disease, and illness are affected by multiple levels of organization, from the societal to the molecular” (Borrell-Carrió, Suchman and Epstein 2004 p. 576), considering biological, psychological and social dimensions of illness. The BPS model was proposed by George Engel, specialist in internal medicine and psychiatry in 1977, with the aim to improve on the then-widely accepted “biomedical model” for understanding disease, which only considered the ‘somatic’, or biological factors, related to disease (Engel 1977).

Engel stated, “the boundaries between health and disease, between well and sick, are far from clear and never will be clear, for they are diffused by cultural, social, and psychological considerations” (Engel 1977 p. 132). The BPS model was his solution for how to build on the current theories to better suit the realities of disease and health care. The BPS model shifts the attention from focusing on the disease to instead focus more on the ‘sick individual’, with the benefit of humanising relationships in healthcare settings and promoting an interdisciplinary approach to care (Havelka, Luanin and Luanin 2009).

The BPS model is widely acknowledged in clinical practice as a valid approach to considering illness in the three dimensions; biological, psychological and social. This model is relevant to this research as exploring the experiences of adults following traumatic injuries involves the interaction of all three dimensions (i.e. physical injuries, psychological factors, and social/environmental context). The BPS model underpins the ICF framework, which was used as a lens for describing and interpreting the participants’ experiences.

### 3.4.2 International Classification of Functioning, Disability, and Health

The International Classification of Functioning, Disability, and Health framework is the World Health Organisation’s framework and standardised language for describing health and disability (2002). The aim of the ICF was to be a tool for measuring a person’s level of functioning in society and uses three domains: function of body or body parts, the whole person, and the whole person in context with their environment (World Health Organization 2002). Within the ICF, disability is seen as a dysfunction at one or more of the three domains (Figure 9). In Figure 9, the components of the ICF are shown and how they interact, with the functioning terms in green (i.e. body functions and structures, activities, and participation) and the equivalent disability terms in blue (i.e. impairments, activity limitations, and participation restrictions).



**Figure 9 – ICF Framework**, adapted from (World Health Organization 2002)

The ICF was novel when introduced because it focuses on an individual’s health and functioning, rather than on disability. The ICF was based on the BPS model and aims to account for how multiple factors that may contribute to disability. In ICF, “disability and functioning are viewed as outcomes of interactions between health conditions (diseases, disorders and injuries) and contextual factors” (World Health Organization 2002 p. 10). The ICF also acknowledges that all people can experience dysfunction in one or multiple domains of health and therefore experience some disability, instead of

viewing those experiencing disabilities as separate from others in society (World Health Organization 2002).

*“Disability is always an interaction between features of the person and features of the overall context in which the person lives, but some aspects of disability are almost entirely internal to the person, while another aspect is almost entirely external” (World Health Organization 2002 p. 9).*

The underlying principles of the ICF relate closely to the BPS model include:

- *Universality* – The ICF is applicable to all people, unrelated to specific health conditions.
- *Parity* – Disability is not differentiated by aetiology or labelled as ‘mental’ or ‘physical’ health conditions.
- *Neutrality* – Neutral language used throughout to be able to express both positive and negative aspects in each domain of health.
- *Environmental factors* – environmental factors considered as part of wider contextual factors and are essential for understanding an individual’s functioning and disability (World Health Organization 2002).

The ICF was intended to be used for a wide range of purposes, including clinical practice, research, and policy (World Health Organization 2002). Due to its versatility, the ICF was identified to be relevant to this research because of its applicability to clinical practice as well as research. The ICF has been used in the traumatic injury population to identify key health-related domains of patients with multiple rib fractures (Claydon et al. 2017), perspectives of recovery and HRQoL of older adults following RTAs (Brown et al. 2020), and in the development of outcome measures for trauma care (Hoffman et al. 2014, 2016).

For this research, the ICF was used in the development of the semi-structured interview guide questions. The researcher asked the trauma network rehabilitation clinicians to suggest topics that they were interested to learn more about, such as patient’s experiences of returning to their usual activities, ongoing limitations and rehabilitation needs, and experiences accessing local services. These suggested topics were identified as mainly relating to the activity and participation domains of the ICF and this knowledge was used to ensure that there was a focus on participants’ activity and participation in the interviews. The ICF was also used as a lens during data analysis as the data were identified to fit into multiple ICF domains and demonstrated the wide range of topic areas covered in the interviews.

### 3.5 Ethical Considerations

Due to the nature of this research and the involvement of human participants, ethical principles and practices were considered in the development and undertaking of this research. Some of the central documents that provide guidance on ethical conduct of medical research are the Belmont Report (National Commission for the Protection of Human Subjects of and Biomedical and Behavioral Research 1979), Declaration of Helsinki (World Medical Association 2013), and UK Policy Framework for Health and Social Care Research (NHS Health Research Authority 2022). The main areas of ethical considerations for this study were recruitment, informed consent, participant and researcher safety, and data management, which are discussed in the following sections.

#### 3.5.1 Recruitment

The study's recruitment strategy involved identifying potential participants from the *Rehabilitation Plan Database*, a live document created by the NoS MTC for audit purposes. Since this database contains patient-identifiable information, such as name and CHI number, use of this information was subject to the approval of the NHS Grampian Caldicott Guardian to ensure the recruitment strategy complied with the eight Caldicott Principles (National Data Guardian 2020) and Data Protection Act ('Data Protection Act 2018, c.12' 2018). Only the clinical team at the NoS MTC had access to the *Rehabilitation Plan Database* and recruitment packs were sent from the NoS MTC on behalf of the research team. Using an opt-in model, interested potential participants were instructed to reach out to the research team to participate in the study via multiple methods set out in the participant information sheet, including email, online form, paper response form (via FREEPOST), or telephone call (see APPENDIX O).

#### 3.5.2 Informed Consent

Informed consent is the process in which participants choose whether they want to participate in research and involved three parts: provision of sufficient information, comprehension of presented information, and that the consent is voluntarily given (National Commission for the Protection of Human Subjects of and Biomedical and Behavioral Research 1979). Informed consent is to confirm that the first principle of the Belmont Report is upheld: "1. Respect for persons" (National Commission for the Protection of Human Subjects of and Biomedical and Behavioral Research 1979 p. 4).

Information about the study (APPENDIX O) and a letter of invitation to participate (APPENDIX N) were sent out in the recruitment packs. During the initial screening telephone call with the researcher, participants had a chance to ask questions or clarify anything that was not clear to them. Informed verbal consent was given by the participants immediately prior to data collection. A consent form was read out verbally to the participant and participant responses were audio recorded using a hand-held password protected voice-recorder. The recording of the verbal consent was saved and stored securely on the study's Research drive (R:/ Drive).

### 3.5.3 Participant safety

Participant safety concerned the second principle of the Belmont Report – beneficence (National Commission for the Protection of Human Subjects of and Biomedical and Behavioral Research 1979). In research ethics, beneficence is the obligation of the researcher to actively ensure that the research is not causing harm to participants and efforts have been made to maximise benefits and minimise possible harms (National Commission for the Protection of Human Subjects of and Biomedical and Behavioral Research 1979).

It is known that speaking or thinking about sensitive topics, such as traumatic events and the consequences of injury (e.g. disability, trauma), can cause short-term distress or psychological challenges for participants (Silverio et al. 2022). To ensure participant safety and minimise possible harms, the possible risks and harms were discussed within the research team and the researcher developed relevant mitigating actions detailed below, as ethical considerations are unique to the research study and there is no “single trustworthy ethical formula” for conducting qualitative research (Allmark et al. 2009).

Mitigating actions for ensuring participant safety involved providing an information sheet (APPENDIX O), obtaining informed verbal consent from participants prior to data collection, signposting mental health resources before and after the interview (APPENDIX S), having an escalation plan in place in the event of a crisis situation arising during the interview (see APPENDIX T, adapted from Haigh and Witham (2015)), and ensuring the interviewer had attended mental health first aid training.

### 3.5.4 Researcher safety

In addition to participant safety, the researcher's mental health and wellbeing was considered because hearing and speaking about traumatic events is known to be a source of secondary or “vicarious” trauma, impacting the researcher's mental health and wellbeing (Dickson-Swift 2022;

Smith et al. 2023). The process of transcribing interviews with sensitive topics can also add to this exposure (Wilkes, Cummings and Haigh 2015; Kiyimba and O'Reilly 2016).

To ensure researcher's health and wellbeing, the researcher attended mental health first aid training prior to data collection involving training on methods to manage mental health crisis situations and provided local mental health resources to signpost to participants, if necessary. The researcher also actively engaged in student counselling throughout the research. During data collection, the researcher and lead supervisor arranged debriefing session after the first interviews, after challenging interviews, and after completion of the data collection phase.

### 3.5.5 Confidentiality and Data Protection

As the research involved private and confidential information, security of data during collection, management, and storage was essential. All participant information and data were stored on the secure research drive (R:/ Drive) on the Robert Gordon University network, which was password protected and only the research team had access to. When a participant opt-ed in to participate in the study, they were given an ID number and this was used to save all related data gathered and referred to in analysis and findings. All personal or identifying information was only stored on the secure research drive, separately from the demographic information and anonymised interviews. Other study documents and anonymised data were accessed by the researcher and supervisors using Microsoft Teams Sharepoint, which is GDPR-compliant (Microsoft 2023). The interviews were recorded on a password-protected audio recording device, then saved onto the research drive immediately following the interview and deleted from the device.

Maintaining confidentiality of participants in qualitative research requires extra consideration as qualitative research often includes detailed descriptions of participants' experiences in the form of participant quotes, which may inadvertently be identifiable if steps are not taken to ensure confidentiality (Kaiser 2009). Direct quotes from participants used to demonstrate findings were anonymised and verified to be non-attributable to the participant. Demographic information was presented in an aggregate form and not linked to participant IDs. Participant confidentiality was considered at all stages of the study, from development of the data storage procedures to data collection and management, and dissemination of the findings (Kaiser 2009).

### 3.6 Ethical Approvals for Study

This study was submitted for ethical approval to RGU's School of Health Sciences Research Ethics Committee and was approved on 12<sup>th</sup> December 2022 (APPENDIX H). After this approval, several amendments were submitted and approved, including:

- Modifications to recruitment materials and collaborative data collection software (i.e. Microsoft Teams Whiteboard) prior to start of data collection (APPENDIX I).
- Added use of a sampling matrix due to positive recruitment response rate (APPENDIX J).

Due to the scope of the research question, this study was classed as a service evaluation based on the Health Research Association criteria, as it did not meet the criteria to be recognized as research, mainly due to the fact that the findings will not be widely generalisable to the wider traumatic injury population (Health Research Authority 2022). As a result, this study did not need to be submitted to NHS REC or require local R&D permissions (APPENDIX K). Instead, the study was registered with NHS Grampian's Quality Improvement and Assurance Team (QIAT) (APPENDIX L - Project ID: 5791) As the recruitment used a patient database from NHS Grampian, Caldicott Guardian approval was sought to ensure compliance with the Data Protection Act (APPENDIX M- Reference #: CG/2022/157).

### 3.7 Methods

#### 3.7.1 Setting

This research study was set in the North of Scotland, which the North of Scotland Major Trauma Network defines as the five northern NHS health boards in Scotland (NHS Grampian, NHS Highlands, NHS Orkney, NHS Shetland, and NHS Western Isles). This research study focused on adults that sustained a traumatic injury in the North of Scotland and were treated by the NoS MTN. For most patients, this involves initial treatment at Aberdeen Royal Infirmary, the regional hospital and the NoS MTC. Some patients require further medical or rehabilitation input and would transfer to specialist units, such as the orthopaedic rehabilitation unit, before discharge back to a community setting.

#### 3.7.2 Participants

This study aimed to recruit participants with major and moderate traumatic injuries, as defined by Injury Severity Score (ISS). ISS is an injury classification system that is used to describe severity of a patient's injuries (see section 1.4.2.2), with an ISS of nine to fifteen as moderate trauma and greater



than fifteen as major trauma (Public Health Scotland 2021a). This study excluded participants with neurological injuries, mainly due to the different prognosis and management of neurological injuries, as discussed in Section 1.5 – Terminology in Chapter 1.

As this study was looking at the recovery experiences of people after leaving hospital, eligible participants were required to live in the North of Scotland at the time of the interview, defined by the five NHS health boards included in the NoS MTN.

Table 18 reports the inclusion and exclusion criteria used to determine eligibility of participants.

**Table 18 - Participant Inclusion and Exclusion Criteria**

Inclusion Criteria	Exclusion Criteria
- Adults (aged 18 years or older)	- Injuries involving lasting damage to spinal cord, brain, or peripheral nerves (i.e. patients with neurosurgery or neurology listed as lead specialty in <i>Rehab Plan Database</i> during their admission to ARI)
- Moderate and major non-neurological traumatic injuries (i.e. Injury Severity Score $\geq 9$ )	- Adults with minor traumatic injuries (i.e. Injury Severity Score $< 9$ )
- Medical care delivered in the North of Scotland Major Trauma Centre at Aberdeen Royal Infirmary	- Unable to speak and/or read English
- Able to speak and/or read English	- Filed as deceased in TrakCare system.
- Currently living in the North of Scotland (i.e. NHS Grampian, NHS Highlands, NHS Orkney, NHS Shetland, and NHS Western Isles).	- Residential address listed as outside of North of Scotland (i.e. living outwith the 5 Scottish health boards listed)

### 3.7.3 Sampling Strategy

The study used purposive sampling, a non-probability sampling strategy that aims to recruit participants that have experienced the phenomenon of interest (Creswell and Clark 2017). For this research, the study purposefully recruited participants that were identified by the NoS MTC for receiving care in the NoS MTN following a major or moderate traumatic injury, as this study was focused on the recovery experiences of these individuals.

Originally, the target sample size was ten to fifteen participants, based on qualitative methodology literature, which states that ideal sample sizes for qualitative studies range somewhere between

twelve to fifty individual interviews (Ritchie et al. 2014a). The range in the target sample size acknowledged that the final sample size could vary due to factors such as availability of the NoS MTC clinical team for recruitment, study timeline, and availability of potential participants.

Due to success in the recruitment phase, an amendment was added to increase the target sample size from fifteen to up to twenty-four participants, based on the sampling matrix in Table 19. The sampling matrix improved on the original sampling strategy and allowed for maximum variation sampling (also known as heterogenous sampling). By including a wide range of participants, this sampling method aims to identify central themes, as well as unique perspectives, of the participants' experiences (Ritchie et al. 2014a).

The sampling matrix was created using age and gender as the main criteria, as these were variables that the research team was able to screen for in the initial telephone call (see Table 19). The age categories were selected based on previous trauma literature categorizing older adults as aged 65 years and up (Reeder et al. 2021; Conn et al. 2023), then a pragmatic split of the younger adult age groups into 18 to 44 years old as the younger adult group, and then 45 to 64 years old representing the general period that historically has been classified as 'midlife' adult group (Lachman, Teshale and Agrigoroaei 2015).

Other variables that were considered for addition to the sampling matrix were ISS and location of residence, as these variables could impact on the recovery experiences of individuals, but due to the study timeline and resources available, it was not feasible to expand the sampling matrix to include both these variables in this study.

**Table 19 – Example Sampling Matrix**

Gender	Male			Female		
<b>Age (years)</b>	<i>18 – 44</i>	<i>45 - 64</i>	<i>65+</i>	<i>18 - 44</i>	<i>45 - 64</i>	<i>65+</i>
<b>Target # of participants</b>	2-4	2-4	2-4	2-4	2-4	2-4

#### 3.7.4 Recruitment

Potential participants were identified from the NoS MTC's patient database, the *Rehabilitation Plan Database*, by the NoS MTC clinical team. The *Rehabilitation Plan Database* is a live document created in April 2020 for audit purposes and is updated regularly by the NoS MTC clinical team. For this study, the sampling date range of April 2020 to December 2021 for admission to Aberdeen Royal Infirmary

(ARI) was used to avoid conflict with a separate service evaluation project that was undertaken in 2022.

The NoS MTC clinical team screened the *Rehabilitation Plan Database* using the inclusion/exclusion criteria to identify potential participants. The NoS MTC clinical team were instructed to invite all patients on the *Rehabilitation Plan Database* that met the inclusion criteria within the identified date range. The *Rehabilitation Plan Database* was screened starting from the end of the sampling date range (i.e. December 2021) and worked back to the start (i.e. April 2020), contacting those that were most recently discharged from hospital first.

Recruitment packs were sent via post to potential participants from the NoS MTC, ensuring that distribution of recruitment packs was through the gatekeeper (i.e. North of Scotland Major Trauma Centre) to guarantee no direct approach from the research team or sharing of potential participant contact details with the research team. Recruitment packs included a letter of invitation (APPENDIX N), a participant information sheet (APPENDIX O) detailing the purpose of study and how to participate, and a paper response form (APPENDIX P) with pre-labelled FREEPOST return envelope.

Participants had time to consider taking part at their convenience. To accommodate for personal preferences, several methods were offered for individuals to register their interest in the study, which included: a paper response form with pre-labelled FREEPOST return envelope by post, the study email address, a URL link and QR code to an online sign-up form (Jisc online survey, GDPR compliant), and the lead supervisor's telephone number to call.

The researcher contacted potential participants via telephone to discuss the study, answer any questions, and check eligibility criteria for inclusion in the study. If the participant was happy to take part, a mutually suitable date, time, and mode for the interview were arranged. Participants were then emailed or posted a confirmation of the arranged time, with an example timeline template (APPENDIX Q), a copy of the demographic questions (APPENDIX R), and signposting to mental health resources (APPENDIX S) in the event of an adverse event such as participant distress due to the topics discussed in the interview.

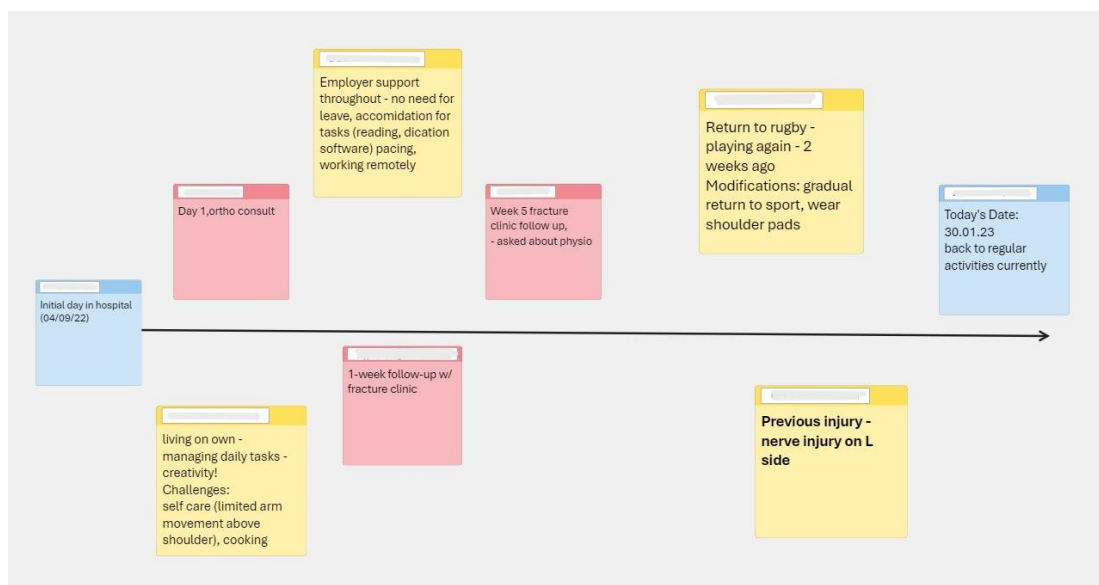
Other options were considered for improving recruitment included a social media recruitment strategy and contacting local traumatic injury charities, similar to the recruitment approach of Bridger et al. (2021). These options were discussed with the NoS MTC clinical team and deemed to not be feasible, as there are no local trauma charities and a social media campaign would not be effective because ISS is not used clinically and not something patients would know or have been told in hospital, so individuals would not know if they were eligible.

The contingency plan for under-recruitment was for the NoS MTC clinical team to send an additional round of reminder recruitment packs three to four weeks after initial recruitment to the previously identified potential participants from the *Rehabilitation Plan Database*.

### 3.7.5 Data Collection

The semi-structured interviews took place on Microsoft Teams (MS Teams) or via telephone, based on participant preference. Previous research conducted by the research team showed that some participants prefer seeing the researcher during an interview. Interviews were recorded using a separate, secure password-protected encrypted audio recorder. The interview topic guide (APPENDIX U) was piloted with peers and members of the clinical supervisory team to practice using MS Teams and to finalise the topic guide. Following piloting, a structured introduction to the interview and reminders for turning on and off the audio recorder were added, as well as finalising the order of the questions with use of the EQ-5D-5L outcome measure near the end of the interview.

Demographic information including age, gender, type of injury, mechanism of injury, time from injury, current employment status, education level, ethnicity, and postcode was collected from the participant at the beginning of the interview after obtaining verbal consent. For interviews completed on MS Teams, the participant and researcher created a timeline of the participant's recovery journey using MS Teams collaborative Whiteboard throughout the semi-structured interview, with both the researcher and participant able to note events on the timeline, such as local services used, date of returning to work and previous activities, as well as important personal milestones (see example Figure 10). An image of the timeline was saved at the end of the interview with verbal consent from interview guide was used, but a collaborative timeline was not created during the interview, instead the researcher constructed a timeline in the field notes to refer to throughout the interview. The interview also included the interviewer-administered EQ-5D-5L (see APPENDIX F), an outcome measure that is used to capture participants' current health related quality of life (EuroQol Group 2022). the participant. For the interviews completed via telephone, the same



**Figure 10 – Timeline Whiteboard Example from Mock Interview**

### 3.7.6 Materials and Software

The data collection and analysis process involved equipment and software, listed here.

Interviews were conducted on Microsoft Team, as it is GDPR compliant (Microsoft 2023).

Interviews were audio-recorded using a separate password-protected, encrypted audio recorder (Olympus DS-9000 Digital Recorder) and the downloaded to the corresponding software, *Olympus Dictation Management System* (OM System 2022).

The audio recordings were transcribed using *AmberScript* transcription software (Amberscript Global B.V. 2024). *AmberScript* is a GDPR-compliant service that provided a machine-created verbatim transcription file in an editable format.

Data management was completed using *NVivo R1* (Lumivero 2022), a computer assisted qualitative data analysis software (CAQDAS) that assisted with the indexing and creation of the framework matrices.

Data analysis was carried out on Microsoft software including Microsoft Word and Microsoft Excel (Microsoft Corporation 2022).

### 3.7.7 Data Processing and Analysis

After each interview, audio recordings and the timeline image were uploaded to the secure R:/ Drive on the Robert Gordon University network. Verbal consent audio files and interview files were saved separately, using only the participant ID numbers. Demographic responses were recorded and saved on the secure R:/ Drive, using the participant ID number. All written material created during the interview that contained confidential or sensitive participant information was disposed of securely in the School of Health Sciences' confidential waste receptacle.

Participant anonymity was maintained throughout the study by assigning each participant a Participant ID number. This Participant ID number was used for anonymising transcripts, demographic information, and reporting of participant quotes in the findings (i.e. Participant ID number, gender, age group, major or moderate trauma).

#### 3.7.7.1 Transcription of Interviews

All interviews were conducted in English, as the native language of the researcher. Interview audio recordings were transcribed by the researcher using *AmberScript* transcription software that provided a machine-created verbatim transcription file, which was then checked for accuracy, anonymised, and edited by researcher using intelligent verbatim transcription. Intelligent verbatim, or naturalised transcription, is a form of transcription where the transcriber optimizes the interview data to a written format over an oral format (Bucholtz 2000; McMullin 2023). This differs from verbatim transcription (or denaturalised transcription) as verbatim prioritises the oral format of the data, which accurately represents the spoken language, but is less clear when reading in the written format (Bucholtz 2000). Verbatim transcription is commonly used in qualitative methodologies such as grounded theory and critical discourse analysis, as these methodologies aim to explore the structure and use of language (Oliver, Serovich and Mason 2005).

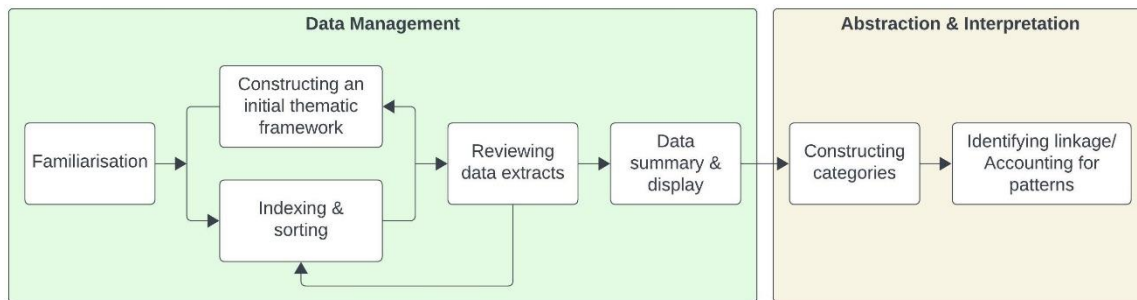
Intelligent verbatim transcription was used for this research because the written form of the transcripts were used for data analysis, so enhanced 'readability' was better suited to framework analysis, as the focus is the transcript content, rather than the linguistic aspects (Gale et al. 2013). Intelligent verbatim transcription also enhances the readability of the participant quotes in the findings section, therefore making the findings more accessible for sharing in practical contexts outside the academic context.

During transcription, the researcher added in emotions and nonverbal cues (e.g. laughs, emotion in voice) that conveyed meaning and removed filler words for clarity (McMullin 2023). All interviews

were anonymised with all identifying information, such as place names and names of people removed, and descriptive placeholders were added instead.

### 3.7.7.2 Framework Analysis

As previously discussed in Section 3.3.8.2, the framework analysis method was used to manage and analyse the interview data. The terms used for data management and analysis are based on terms used in the Framework Analysis method as set out by Ritchie et al. (2014b). These may differ from terms used in other qualitative research, such as ‘indexing’ versus ‘coding’ of raw data and the labels for the classification of data into higher-order classes and themes (i.e. element, dimension, category, class, theme) (Ritchie et al. 2014b). The general process of the data management and analysis stages are displayed in Figure 11 and explained briefly below with a detailed explanation in the Findings chapter (see sections 4.4.3, 0).



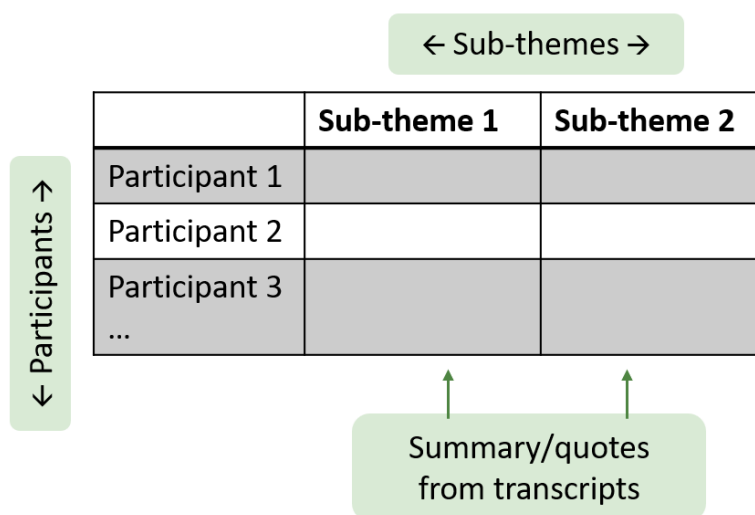
**Figure 11 - Framework Analysis Process**, adapted from (Ritchie et al. 2014b)

### 3.7.7.3 Data Management

The first step was familiarisation, where the researcher familiarised herself with the data through transcribing, reviewing transcripts, and reviewing the reflexive field notes from interview. That was followed by an initial indexing phase where the researcher and supervisor piloted indexing three transcripts independently and identified and labelled concepts from the interview transcripts that related to the research question. The term ‘indexing’ is synonymous with the term ‘coding’ used in other qualitative methods, and refers to the labelling of data extracts (Ritchie et al. 2014b). The concepts labelled are referred to as ‘codes’, meaning “a word or short phrase that symbolically assigns a summative, salient, essence-capturing and/or evocative attribute for a portion of language-based or visual data” (Saldaña 2009 p. 3)

Using the indexed codes from the piloting stage, the researcher constructed an initial thematic framework and input this into NVivo data management software. The researcher then uploaded the anonymised transcripts into Nvivo and re-indexed the three piloted interviews using the initial thematic framework, to ensure that all the initial codes were captured by the initial thematic framework codes. The researcher then indexed all remaining interviews on NVivo, using the previously identified codes, adding codes when new concepts were identified.

After completing the indexing, the researcher reviewed all codes and combined these into groups based on similarity of meaning. This grouping of codes was discussed with supervisors and the proposed grouping were used to create framework matrices. An example of framework matrices is shown in Figure 12. Framework matrices provide “summaries of thematically sorted data” that is accessible and ready for the analytical stage of abstraction and interpretation of the data (Ritchie et al. 2014b p. 306). The researcher created the framework matrices on NVivo and filled each of the matrix cells with a summary of the previously indexed data.

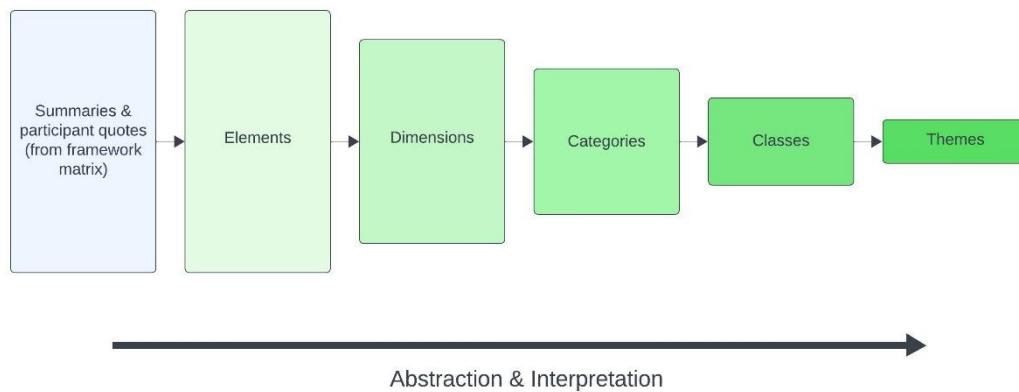


**Figure 12 – Example Framework Matrix**

#### 3.7.7.4 Abstraction and Interpretation

After all the framework matrices were completed, each framework matrix was exported from NVivo into Excel for the interpretation and analysis stage. The steps involved in this process are displayed in Figure 13.





**Figure 13 – Abstraction and Interpretation Steps for Framework Analysis**

On Excel, the framework matrices were expanded and the summaries and participant quotes in each matrix cell was used to identify ‘elements’. Identifying elements was completed by reviewing the summaries in the matrix cells, “noting the range of perceptions, views, experiences or behaviours” and listing different elements from these summaries (Ritchie et al. 2014b p. 311).

After identifying the elements for all the summaries in the matrices, the framework matrix topics were reviewed to see if there were subthemes that could be combine together to avoid duplication of data (Ritchie et al. 2014b). All the elements for all matrices were then combined into a Word document and each element was labelled with the corresponding Participant ID number. The researcher then began grouping the elements into dimensions, which are groups of elements that capture the “basic concept or theme that encapsulates what the variation [in the elements] is about” (Ritchie et al. 2014b p. 311).

After all the elements were grouped into dimensions, the next step was to group the dimensions into categories. These categories remained descriptive, with the aim that the ideas they encapsulate would be recognisable to participants (Ritchie et al. 2014b).

The final stages of the descriptive analysis was grouping the categories into classes, then finally the classes into themes. These higher-order classifications aimed to capture the variety of perspectives and describe the variations, all while maintaining the clear connection to the elements to ensure transparency (Ritchie et al. 2014b). These themes are presented in the findings chapter (Section 4.6).

The next stage in the analysis phase was identifying typologies and linkages to account for patterns in the data. Typologies are “a form of classification that segments data or cases into discrete positions along a continuum” (Ritchie et al. 2014b p. 317). Linkages are “patterns of association in the data”, or ways to explain how the higher-order classifications may be connected (Ritchie et al. 2014b p. 318). There are multiple types of linkages (i.e. single-dimensional, complex single-linkage, multiple-linkage typologies) that can map the connection between phenomena or between subgroups that hold different characteristics (Ritchie et al. 2014b). The consideration of typologies and linkages are discussed in Section 4.4.4.

#### 3.7.7.5 EQ-5D

As described in Section 3.3.8.1, the EQ-5D is a generic PROM developed by the Euro-QoL Group that measures self-reported health (Devlin, Parkin and Janssen 2020b). Health measured by the EQ-5D can be described as ‘health status’ or ‘health-related quality of life’ (HRQoL) and covers five dimensions of health: mobility, usual activities, self-care, pain & discomfort, and anxiety & depression (Devlin, Parkin and Janssen 2020b).

The EQ-5D consists of a descriptive system in which participants are asked to indicate the level of problems they experience in each of the five dimensions, with the results reported as an ‘EQ-5D profile’. This provides a descriptive summary for each participant, which can be visualised as five separate sentences or a series of numbers and generally describes participants’ health-related quality of life (Devlin, Parkin and Janssen 2020b). The second part of the questionnaire is a visual analogue scale (VAS) of the participant’s overall assessment of their current health on a scale from 0 – 100 (i.e. worst health – best health imaginable, respectively) (Devlin, Parkin and Janssen 2020b). The EQ VAS identifies how participants feel about their overall health, which compliments the data collected in the earlier questions as the five dimensions do not account for all areas that impact on health-related quality of life (Devlin, Parkin and Janssen 2020b).

The EQ-5D-5L version of the questionnaire was used for this study, which includes five severity levels, compared to the three severity levels in the original version, the EQ-5D-3L (Devlin, Parkin and Janssen 2020b). The EQ-5D-5L version was chosen as it has been shown to demonstrate better precision for reporting individual and group health status (Janssen, Bonsel and Luo 2018). The interviewer version was used during the interview, with permission obtained prior to data collection (APPENDIX G).

As this research was exploratory and cross-sectional, simple descriptive statistics were used to evaluate the data using the EuroQol Group guidelines outlined in Devlin et al. (2020b). EQ-5D profile data and EQ VAS values are displayed in an aggregated format to ensure participants anonymity.

### 3.8 Rigour

Rigour, also referred to as trustworthiness, is an important consideration that can be defined as “the degree of confidence in data, interpretation, and methods used to ensure the quality of a study” (Connelly 2016 p. 435). Saunders et al. detailed two different types of rigour to consider: *theoretical rigour*, or the “clarity and thoroughness with which the research as reported is grounded in the existing explanations of how things work” (2023 p. 7) and *methodological rigour*, regarding “the strength and quality of the research method used in terms of planning, data collection, data analysis and subsequent reporting; and therefore the confidence that can be placed in the conclusions drawn” (2023 p. 7). This section will focus on the methods used to maintain methodological rigour in this research.

The idea of methodological rigour originated in quantitative research, from the positivist philosophy and realist view of wanting to find the one true reality (Guba 1990). Four criteria are used to define rigour in quantitative research: generalisability, reliability, validity, objectivity (Alele and Malau-Aduli 2023a). The qualitative equivalents of these four criteria were developed by Lincoln and Guba in 1985: credibility, dependability, transferability, confirmability and later added authenticity (Connelly 2016). The definitions and practices used in this research are detailed in Table 20.

#### 3.8.1 Practice of Reflexivity

As this research used an applied qualitative approach, reflexivity was an important aspect of maintaining the research rigour (Barrett, Kajamaa and Johnston 2020). Reflexivity is defined as, “a set of continuous, collaborative, and multifaceted practices through which researchers self-consciously critique, appraise, and evaluate how their subjectivity and context influence the research processes” (Olmos-Vega et al. 2022 p. 2). The purpose of reflexivity is to identify any past experiences with the research topic and consider how these may impact on the interpretations of the data (Creswell and Creswell 2018).

The researcher created a reflexivity plan based on the work of Walsh and Olmos-Vega et al. for the reflexive activities that were undertaken throughout the primary research study (see APPENDIX V)

(Walsh 2003; Olmos-Vega et al. 2022). Before data collection, I wrote a narrative autobiography based on the reflexive prompts from Olmos-Vegas et al., which set out what preconceptions about what the recovery and rehabilitation experiences of participants I may have, in order to help me understand my preconceptions and how they might affect the interviewing and data interpretation (Olmos-Vegas et al 2022). This autobiography was reviewed throughout the data management process and after data analysis. I also completed a self-interview with the interview guide questions, to understand what preconceptions I may have from my prior experiences and knowledge. These self-interview questions were reviewed mid-way through data collection, at the end of data collection, and following data analysis, adding in comments and observations each time with any new or modified ideas or thoughts.

Field notes were taken during the interviews and I wrote up a brief summary after each interview, noting any thoughts on how the interview went, main topics or themes, any new concepts or ideas that were coming up, and personal notes for myself for improving facilitation techniques for the following interview.

**Table 20 - Rigour Criteria and Practices**, definitions from (Connelly 2016 pp. 435–436)

<b>Qualitative rigour criteria</b>	<b>Rigour practices in this research</b>
<b>Credibility</b> - confidence in the truth of the study and therefore the findings.	<ul style="list-style-type: none"> <li>– Team discussions throughout data collection and analysis</li> <li>– Reflexive practice plan</li> <li>– Participants willingly shared experiences during interviews</li> </ul>
<b>Dependability</b> - the stability of the data over time and over the conditions of the study.	<ul style="list-style-type: none"> <li>– Interviews conducted with same semi-structured interview guide</li> <li>– Interview guide available for review (APPENDIX U)</li> <li>– Regular team meetings with research team</li> <li>– Research journal maintained throughout for record of processes and decisions</li> </ul>
<b>Confirmability</b> - the neutrality or the degree findings are consistent and could be repeated.	<ul style="list-style-type: none"> <li>– Findings supported with anonymised participant quotes</li> <li>– Research journal maintained throughout for audit trail of decisions throughout study</li> <li>– Regular team meetings with research team</li> </ul>
<b>Transferability</b> - the extent to which findings are useful to persons in other settings.	<ul style="list-style-type: none"> <li>– Purposive sampling for interviews</li> <li>– Providing details on study context, participant demographics</li> <li>– Transparent reporting of analysis methods and results</li> </ul>
<b>Authenticity</b> - the extent to which researchers fairly and completely show a range of different realities and realistically convey participants' lives.	<ul style="list-style-type: none"> <li>– Purposive, maximum variation sampling strategy used</li> <li>– Representation of participant's voice with use of anonymised quotes in findings</li> </ul>

Alongside the exercises in the reflexivity plan, I also kept a regular research journal that was used to document all the research activities completed and reflections on activities and experiences throughout the thesis. This research journal changed forms throughout the thesis, but was useful to look back on at different times throughout the process.

### **3.9 Summary**

This chapter discussed the aim of this research, informed by clinical input and the findings of the systematic review. Justification for decisions relating to the approach to research were discussed, including the philosophical perspective, methodology, and methods used. This research used a pragmatic philosophy and Interpretive Description approach to explore the recovery and rehabilitation experiences of adults with traumatic injuries. The researcher's worldview was shared, along with the steps taken to maintain rigour throughout the study, such as a reflexivity plan and use of a research journal. In the next chapter includes a discussion of the qualitative data collection and analysis process and presents the findings of this primary research study, including participant demographics and the qualitative findings.

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## CHAPTER 4: FINDINGS

### 4.1 Introduction

Using the methodology and methods described in the previous chapter, the primary research was undertaken throughout the year 2023. This chapter begins by detailing the data collection and analysis process, then presents the participant demographics, including the self-reported injuries and EQ-5D responses. The qualitative findings are discussed by theme, with the findings illustrated with participant quotes and discussed in context with the wider literature. This is followed by the implications of the findings for clinical practice, the strengths and limitations of the research, and a reflection on the reflexive practices undertaken in this research. The following chapter will provide a summary of the findings of the thesis and provide recommendations for clinical practice and future research.

### 4.2 Recruitment

Recruitment began on 8<sup>th</sup> February 2023 with the NoS Major trauma coordinators sending out recruitment packs through the post. These were sent out in staggered manner, as this was manageable for the trauma coordinators to complete around daily clinical tasks and beneficial for the research team to be able to gauge engagement throughout recruitment and when to stop recruitment. One hundred and thirty-nine recruitment packs were mailed out between the 8<sup>th</sup> and 20<sup>th</sup> February 2023. As per the recruitment protocol, eligible participants with the most recent admission dates to the NoS MTC were recruited first (i.e. December 2021) and then worked backwards, with all eligible participants admitted to the NoS MTC between 6<sup>th</sup> October 2020 – 21<sup>st</sup> December 2021.

Thirty-three individuals reached out to the research team. All methods of contacting the research team were used: paper response form via post (n=21), online via Jisc survey (n=8), study email (n=2), and phone call (n=2). Of the 33 individuals, five were excluded due to being ineligible (i.e. residence outside North of Scotland (n=1), neurological injuries (n=1), non-traumatic mechanism of injury (n=1), seeking follow up from MTC (n=1), unable to contact (n=1)) and then a purposive sample of 21 participants was drawn from the remaining 28 respondents.

The recruitment strategy was successful with a response rate of 23.7%. Due to early success in recruiting the initial number of participants, a purposive sampling framework was added to ensure that a large range of participant voices were included while maintaining within the study resources

and timeline requirements (see Table 21). The aim was to have two to three participants for each age range for each gender, as age and gender were the only available characteristics that were identifiable for the research team at the screening stage. Five females in the 45 – 64 year age range were included because these interviews were completed early in the data collection phase. The seven individuals that contacted the research team but were not included were male and followed up with to thank them for their interest in the study and informed that the study was no longer recruiting further participants.

**Table 21 - Sampling Matrix of Included Participants**

Age Range (years)	Male	Female
18 - 44	3	2
45 - 64	4	5
65 +	4	3
<i>Total</i>	11	10

### 4.3 Sample Adequacy

The final sample size for the study was based on the completion of the sampling matrix and sample adequacy, instead of the commonly used term, ‘saturation’. Thorne warns of the “overreliance on the inappropriate use of the term ‘saturation’” (Thorne 2016 p. 107), as is commonly used as a benchmark of quality in qualitative research (O’Reilly and Parker 2013).

There are two types of ‘saturation’ used in the social sciences – the first is *data saturation*, referring to “information redundancy, implies that something has been heard so frequently that it can be anticipated” (2016 p. 107), and the second is *theoretical saturation*, indicating that “the events under investigation have come to a sufficiently comprehensive end, that their properties and conceptual dimensions have been thoroughly documented, and that their complexity and variation have been fully captured” (Thorne 2016 p. 107). The idea of theoretical saturation originates from grounded theory and indicates that “categories are fully accounted for, the variability between them are explained and the relationships between them are tested and validated and thus a theory can emerge” (O’Reilly et al. 2013 p. 192), fitting the explanatory aims of the research method.

The claim of achieving theoretical saturation in social science indicates that the researcher is confident that no new variations on the theory would emerge from further data collection, but Thorne argues that this conflicts with the philosophical elements that underpin applied qualitative



research. This study uses a pragmatic philosophy and a relativist ontological perspective, implying that there are multiple realities and also acknowledges the “possibility of infinite experiential variation” in themes in the applied context (e.g. clinicians always looking for novel factors that impact on patients’ care) (Thorne 2016 p. 107).

After considering the implications of using the term ‘achieving saturation’, the term ‘sample adequacy’ was deemed to be a more appropriate and transparent choice for determining final sample size, as sample adequacy is “not determined solely on the basis of the number of participants but the appropriateness of the data” (O’Reilly and Parker 2013 p. 195). Instead, this study aimed to achieve sample adequacy by collecting the sufficient depth of information to fully explore the phenomena of interest (Fossey et al. 2002). The use of sample adequacy fits the study’s pragmatic philosophy and underpinning elements (i.e. relativist ontological perspective, value-driven axiological position), as opposed to claiming to have reached ‘theoretical saturation’ from this exploratory study, as this was not appropriate. This study’s sample adequacy was decided based on guidance from Thorne (2016) on qualities of applied ID research and use of the sampling matrix.

Thorne recommends identifying the minimum number of participants that were needed to find commonalities across them (Thorne 2016). The minimum number was identified in the original sampling strategy (i.e. 10). This was achieved early in recruitment, so the sampling matrix was introduced to incorporate maximum variation sampling, therefore enhancing the original sampling strategy. Once the sampling matrix met the minimum number of participants in each cell (i.e. two participants), the researcher then considered the depth and breadth of data collected in the interviews at that point. With the average length of interview running 50 minutes and having gained the diverse perspectives from a wide range of participants that varied in gender, age, types of injuries, as well as other demographic data, the researcher identified that there was an adequate amount of data to explore this topic in-depth and to capture variations in experiences and perspectives, therefore sample adequacy was achieved.

#### **4.4 Qualitative Data: Collection, Management, and Analysis**

##### **4.4.1 Data collection – Semi-structured Interviews**

From the thirty-three individuals that contacted the research team, twenty-one interviews were scheduled and completed between 22<sup>nd</sup> February and 22<sup>nd</sup> March 2023. Most of interviews took place on MS Teams (n=15) with the remained taking place via telephone (n=6). Out of the twenty-one interviews, two interviews were re-scheduled successfully. Technical issues were noted during

five interviews relating to connectivity, camera and screensharing functions on Teams, with one participant unable to access the Teams invitation. The length of interviews ranged from 22 minutes to 1 hour and 14 minutes, with the average length of 50 minutes (median: 50 minutes).

For the interviews conducted on MS Teams, a timeline was constructed on an interactive whiteboard and saved at the end of the interview was saved by the research team. For telephone interviews, the same interview topic guide was used, but a collaborative timeline was not completed due to the lack of an interactive display due to the nature of an audio-only interview, but the interviewer made personal notes for a basic timeline to help guide the interview. As the quality of time-specific information varied greatly between interviews, these were not used further in data analysis.

All participants that were asked were happy to receive the preliminary results of the study and preference for electronic or paper copies was recorded. In cases where the researcher deemed it necessary, participants were signposted mental health resources following the interview (n=2) and called to check in the day after the interview (n=1).

#### 4.4.2 Use of Timeline Approach

The use of a timeline approach was used in the development of the semi-structured interview topic guides. This was augmented with the creation of a collaborative timeline throughout the interview for interviews conducted on MS Teams. Participants were sent a copy of the timeline template prior to the interviews, so there was a chance for them to prepare and make notes, if desired. The aim of creating a visual timeline was to be able to capture the timing of the participant's recovery experiences, such as when they were able to access services or return to activities. A collaborative timeline was only created in interviews that took place on MS Teams, as the interviews conducted via telephone lacked an interactive display. For telephone interviews, the researcher did complete a hand drawn timeline in the field notes to be able to note where additional clarification or questions arose throughout the interview.

The aim of completing the visual timelines during the interviews was to be able to analyse the timelines from all participants to look for common themes or unique experiences, possibly aggregating the results into a map of current experiences, similar to the rehabilitation pathway developed by Kettlewell et al. on the experiences of trauma survivors in England (2021 fig. 2). Throughout data collection, the researcher identified several challenges to completing the timelines and using them for this purpose.

First, the interactive aspect of creating the visual timeline was limited. In the piloting stage, the mock participants reported that they found it challenging to speak and use the virtual whiteboard simultaneously, which was improved by having the researcher fill in the timelines while the mock participant answered the interview questions. In the interviews on MS Teams, the researcher demonstrated the use of the virtual whiteboard and offered that the participants could add to the timeline, but all participants preferred for the researcher to complete the timeline while they answered the questions. This limited the interactive aspect of creating the timeline, which is a known benefit of using timelines in interviews as it “mediates the power imbalance between the interviewer and the participant” (Kolar et al. 2015 p. 25), and therefore a practical limitation of using the virtual whiteboard during the interview.

Another challenge that limited the analysis of the timelines was the varying detail of time-related information participants were able to recall. Some participants, namely ones that had maintained diaries throughout their recovery, were able to provide detailed accounts of when their recovery activities occurred (e.g. timing of rehabilitation follow up, resuming certain activities). Most participants had a general idea of their recovery timeline, but were unable to remember specific dates. Others still had minimal recall of the order of recovery events, but were able to describe the experiences of their recovery in detail. As the primary aim of this research was to explore the experiences of the participants, the participant’s experiences were focused on over completing an accurate timeline. As there was great variety in the quality of the timelines, the timelines were not aggregated as it would not have added to the study as the range of experiences participants spoke about were captured in the qualitative data.

The researcher did identify several benefits of using visual timelines during the interviews. Using the timelines as a visual aid, the researcher was able to ensure that the whole recovery journey was discussed throughout the interview, offering natural prompts to guide the conversation to timepoints throughout the recovery timeline. One negative aspect of using the timeline technique was identified; with the participants that gave detailed information on the timing of events, it was observed that the qualitative data on their experiences were less rich and descriptive on the first question compared with other participants. This was managed by the researcher prompting for participants to elaborate on experiences throughout the interview, when appropriate.

#### 4.4.3 Data Management

As per the protocol in the methods, participant contact information, demographics, and interview audio recordings were saved to the secure R:/ Drive. Interviews were transcribed by the researcher

using *AmberScript* transcription software and intelligent verbatim transcription method. Anonymised interview transcripts were saved to the R:/ Drive and also saved on Microsoft Teams Sharepoint to allow sharing within the team.

The data analysis process first started with the data management phase (see Figure 11). The first step of data management was familiarisation with the data. The researcher was involved in the data collection and transcription of all transcripts and the transcripts were transcribed shortly before beginning data management, so a short familiarisation stage was required. The researcher looked through the interview transcripts that were transcribed earlier and reviewed the reflexive interview field notes from all interviews.

The researcher and lead supervisor then piloted indexing three transcripts on Word. After the initial two transcripts, they met to discuss and compare codes that were identified in the indexing process. These initial codes were then collected into a separate Word document and sorted into groups based on meaning, forming the start of the initial thematic framework. This process was repeated with the researcher and supervisor independently indexing the third interview transcript using the previously identified codes, adding new topics where necessary, and discussing afterwards. Following this piloting of indexing, the researcher then used the identified codes to create an initial thematic framework on NVivo by sorting the codes into hierarchical groups based on similarity of meaning as a way to organise the numerous codes identified into a system that enabled the researcher to index all the transcripts (see Figure 14).

Codes			Search Project
Name	Files	References	
1. Rehabilitation and recovery	21	648	
2. Follow up_Services	20	286	
3. Support	19	218	
4. Communication with HCPs	9	17	
5. Information provision	15	69	
6. Return to work	16	88	
7. Return to activities	19	84	
8. Enduring impact of injury	21	106	
9. Other	21	166	

LK 189 Items

**Figure 14 – Initial Thematic Framework on NVivo**

The researcher then uploaded all the interview transcripts to NVivo and using the initial thematic framework, re-indexed the three piloted interview transcripts to check that the initial thematic framework matched the codes in the piloting stage. The researcher then indexed the remaining interview transcripts using the codes in the thematic framework. The researcher maintained a reflexive journal detailing her thoughts throughout indexing and saved the different versions of the thematic framework when it was adjusted or new codes were added from the indexing of subsequent interviews.

After indexing all the interview transcripts, the next stage of reviewing the data extracts was conducted. The researcher reviewed the initial thematic framework and all the codes assigned to the data and identified initial codes that could be combine together. This was discussed with the supervisory team and from this conversation, the researcher constructed framework matrices in Nvivo. A framework matrix was created for each initial general theme (i.e. framework matrix theme) identified in the initial framework, with each subtheme as a column and each participant cases as a row (see Figure 12). These initial themes and subthemes are listed in Table 22.

**Table 22 – Framework Matrix Themes and Subthemes**

**Framework Matrix Theme & Subthemes**

1. Patient Journey – Part 1	4. Information & Communication
- Activities during recovery	- Communication with HCPs
- Adaptations	- Information provision
- After discharge from hospital	- Sources of information
- Initial limitations	
- Pain management	5. Services & Support
	- Experiences of follow up
2. Patient Journey – Part 2	- Logistics of follow up
- Early recovery experiences	- Reflections of trauma team
- Factors influencing recovery	- Service provider - reason for follow up
- Milestones & progress	- Perspectives of support
- Participants’ viewpoint on recovery	- Support provider – support
- Rehabilitation	- Timing of support
3. Patient Journey – Part 3	
- Return to activities	
- Enduring impact of injury	
- Current employment	
- Return to work	

The next step was to complete the framework matrices. The researcher piloted charting, or summarising the data identified in the indexing stage, for one framework matrix and discussed with the supervisory team (Gale et al. 2013). Then the researcher charted the remaining four framework matrices independently, writing summaries of the participants' responses in each of the matrix cells, also using participant quotes, where applicable. If a participant did not mention a topic, "N/D" was added to the cell to show that the topic was 'not discussed' in the interview. The summaries and participant quotes were linked to the location in the transcripts (orange highlighting seen in Figure 15). For reflexive practice, the researcher recorded reflections after completing each framework matrix and discussed these with the lead supervisor throughout the process. An example of the initial framework matrix in NVivo is shown in Figure 15.

	A : 4. Communication with HCPs	B : 5. Information provision	C : Sources of information
10 : 2	After she requested more dihydrocodeine at GP, pharmacy followed up with phone call saying that she needed to start weaning herself off it. She found it nice to have that follow up and that they were checking up and making sure that everything was all right.	Osteopath/pilates instructor - 1:1 recovery programme After hospital discharge, she was going backwards and forwards with her thumb injury. She received information and follow up from the hand fracture clinic. Informatin from pharmacy on weaning - see section A. Consultant advised on recovery of thumb injury - 'never go back to as strong as it used to be' Psychology visited in hospital and provided all the paperwork and all their cards, so she could have contacted them at any time.	Pilates teacher - contacted as soon as she came out of hospital Pharmacist - weaning from analgesia advise Self - researched exercises for thumb Consultant at fracture clinic - recovery on thumb injury exercises/prognosis (see section B)
11 : 1	She reported that she 'clicked' with the doctor and understood what he was saying and it made complete sense. <i>So lots of things he said were great words and made an awful lot of sense to me.</i>	Pain medication explained at the hospital and it made sense, warned about pain levels and needing to take strong pain killers Physiotherapy for advise on wearing the sling, how to hold herself, helpful advise on using towel, encouraged movement in injured limb, exercises with simple diagrams Felt like she was given enough information and she also liked to look into things herself for what she could do. Also thinks if you get too much information, it can be overload for some people - <i>Yeah, there's a lot going on and if you get too much it's 'oh goodness' Because</i> Able to phone the ward reception and ask	Physiotherapy - see section B Doctor from trauma team - information on return to work Consultant clinical psychologist Major Trauma Community Psychology Service - psychology information- see section B Hospital staff - see section A and B
	With self-rehabilitation plan,		

Figure 15 – Framework matrix example from NVivo

#### 4.4.4 Data Analysis

The completion of the framework matrices indicated the end of the data management stage, as all the data was organised into subthemes. The completed framework matrices were then exported from Nvivo into Excel for interpretation and analysis. The steps for this process are displayed in Figure 13.

On Excel, the framework matrices were expanded and the summaries and participant quotes in each matrix cell was used to identify 'elements'. An example of an expanded matrix with elements is shown in Figure 16. Once all elements were created for each framework matrices, the thematic topics of the framework matrices was reviewed and collapsed into three themes to avoid duplication of data: Participant Journey, Support, and Services/Follow up (see Table 23).

All the elements for all matrices were then combined into a Word document and elements were labelled with Participant ID number. When duplicates of elements with the same data from the same participant were identified, repetitive elements were removed to simplify data (Ritchie et al. 2014a p. 311). These elements were then used to identify dimensions. The researcher read through all the elements several times before grouping them into dimensions. As this process was only completed by the researcher, regular reflections were recorded throughout the process and discussed with the lead supervisor.

After all the elements were grouped into dimensions, the next step was to group the dimensions into categories based on similarity of meaning. This was completed by the researcher and reflections were recorded and discussed with the supervisory team. An example of the grouping of dimensions into categories can be found in (APPENDIX X).

The final stages of analysis were to group the categories into classes and the classes into themes. This was an iterative process where the researcher worked through the groupings of dimensions up into themes with feedback and input from the supervisory team. In this process of refining the classes and themes, the ICF framework was used as a lens to interpret the overarching themes identified in the data, as the classes were identified to relate to multiple ICF domains (i.e. body structures and function, activities and participation, and environmental factors).

Throughout the final stages of analysis, the researcher reviewed the data for other possible typologies and linkages and discussed with the lead supervisor. Some ideas were investigated, such as service use and identifying any unmet needs, but further explanatory analysis of the data was not feasible as the sample population was heterogeneous in aspects such as age, injury severity, injury types, time after injury, and geographical location, limiting the explanatory ability of the data to explore the classes and themes further.

	A : Communication with HCPs	Elements	B : Information provision	Elements	C : Sources of information	Elements
10 : 2	After she requested more dihydrocodeine at GP, pharmacy followed up with phone call saying that she needed to start weaning herself off it. She found it nice to have that follow up and that they were checking up and making sure that everything was all right.	Appreciated pharmacy follow up call with information on weaning off analgesia	Osteopath/pilates instructor - 1:1 recovery programme After hospital discharge, she was going backwards and forwards with her thumb injury. She received information and follow up from the hand fracture clinic. Information from pharmacy on weaning - see section A. Consultant advised on recovery of thumb injury - 'never go back to as strong as it used to be' Psychology visited in hospital and provided all the paperwork and all their cards, so she could have contacted them at any point.	Recovery information from private osteopath/pilates instructor Information on thumb injury from hand fracture clinic Going 'backwards and forwards' with thumb injury Expectations of recovery of thumb from consultant Contact information from psychology provided in hospital and accessible	Pilates teacher - contacted as soon as she came out of hospital Pharmacist - weaning from analgesia advise Self - researched exercises for thumb Consultant at fracture clinic - recovery on thumb injury exercises/prognosis (see section B)	Pilates/osteo instructor for early/ongoing recovery information Pharmacist for advise on weaning of analgesia Self-researched hand exercises Fracture clinic consultant provided exercises and prognosis on thumb injury recovery
11 : 1	She reported that she 'clicked' with the doctor and understood what he was saying and it made complete sense. <i>So lots of things he said were great words and made an awful lot of sense to me.</i>	Good rapport with doctor (neuropsych?) and communication was effective	Pain medication explained at the hospital and it made sense, warned about pain levels and needing to take strong pain killers Physiotherapy for advise on wearing the sling, how to hold herself, helpful advise on using towel, encouraged movement in injured limb, exercises with simple diagrams Felt like she was given enough information and she also liked to look into things herself for what she could do. Also thinks if you get too much information, it can be overload for some people - <i>Yeah, there's a lot going on and if you get too much it's 'oh goodness'. Because physically... mental - physically you're tired, but mentally you're tired as well.</i> In hospital, was told by a doctor that she would be off work for 8 to 10	Adequate information on pain management and pain medication in hospital Physio advised on sling use, positioning, use of towel, movement & exercises Adequate information provision Information overload possible with too much information as mentally and physically tired at discharge Prepared for return to work timeline Psychology information useful (slow brain/fast brain theory) Written information was useful, able to refer to later	Physiotherapy - <u>see section B</u> Doctor from trauma team - information on return to work Consultant clinical psychologist Major Trauma Community Psychology Service - psychology information- <u>see section B</u>	Physio - same as B Trauma team doctor provided information on return to work consultant clinical psychologist and major trauma community psychologist provided psychology information and techniques

Figure 16 – Elements from framework matrix example



**Table 23 – Initial and Refined Frameworks and Sub-themes**

<b>Initial Frameworks/Subthemes</b>	<b>Refined Frameworks/Subthemes</b>
<p><b>1. Participant Journey - Part 1</b></p> <ul style="list-style-type: none"> <li>1.A : Activities during recovery</li> <li>1.B : Adaptations</li> <li>1.C : After DC from hospital</li> <li>1.D : Initial limitations</li> <li>1.E : Pain management</li> </ul>	<p><b>1. Participant Journey</b></p> <p><i>Early Participant Journey</i></p> <ul style="list-style-type: none"> <li>1.B : Adaptations</li> <li>1.C : After DC from hospital</li> <li>1.D : Initial limitations</li> <li>1.E : Pain management</li> </ul>
<p><b>2. Participant Journey - Part 2</b></p> <ul style="list-style-type: none"> <li>2.A : Recovery experiences</li> <li>2.B : Factors influencing recovery</li> <li>2.C : Milestones &amp; progress</li> <li>2.D : Pt viewpoint on recovery</li> <li>2.E : Rehabilitation – with services</li> </ul>	<p><i>Mid Participant Journey</i></p> <ul style="list-style-type: none"> <li>1.A : Activities during recovery</li> <li>2.A : Recovery experiences</li> <li>2.B : Factors influencing recovery</li> <li>2.C : Milestones &amp; progress</li> <li>2.D : Pt viewpoint on recovery</li> <li>2.E : Rehabilitation – with services</li> </ul>
<p><b>3. Participant Journey - Part 3</b></p> <ul style="list-style-type: none"> <li>3.A : Return to activities</li> <li>3.B : Enduring impact of injury</li> <li>3.C : Current employment status</li> <li>3.D : Return to work</li> </ul>	<p><i>Later Participant Journey</i></p> <ul style="list-style-type: none"> <li>3.A : Return to activities</li> <li>3.B : Enduring impact of injury</li> <li>3.C : Current employment status</li> <li>3.D : Return to work</li> </ul>
<p><b>4. Information and Communication</b></p> <ul style="list-style-type: none"> <li>4.A : Communication with HCPs</li> <li>4.B : Information provision</li> <li>4.C : Sources of information</li> </ul>	<p><b>2. Support</b></p> <ul style="list-style-type: none"> <li>5.E : Perspectives on support</li> <li>5.F : Support provider_support</li> <li>5.G : Timing of support</li> </ul>
<p><b>5.Services and support</b></p> <ul style="list-style-type: none"> <li>5.A : Experiences of follow ups</li> <li>5.B : Logistics of follow ups</li> <li>5.C : Reflections of trauma team</li> <li>5.D : Service provider_Reason for follow up</li> <li>5.E : Perspectives on support</li> <li>5.F : Support provider_support</li> <li>5.G : Timing of support</li> </ul>	<p><b>3. Services/Follow up</b></p> <ul style="list-style-type: none"> <li>5.A : Experiences of follow ups</li> <li>5.B : Logistics of follow ups</li> <li>5.C : Reflections of trauma team</li> <li>5.D : Service provider_Reason for follow up</li> <li>4.A : Communication with HCPs</li> <li>4.B : Information provision</li> <li>4.C : Sources of information</li> </ul>

## 4.5 Participant Demographics

Participant demographics are shown in Table 24. Just over half of the participants were male (52%). The number of males and females was influenced by the sampling process (i.e. use of sampling matrix), as the aim was to get a range of views from participants of different ages and genders. Twenty-one of the 33 potential participants that reached out to the research team were male.

The ages of participants ranged from 20 – 82 years of age at the time of the interview, with the mean of 55.7 years old (standard deviation: 17.1 years). This is similar to the age range and general trends of increased prevalence of moderate and major traumatic injuries in older adults (i.e. over 50 years) in Scotland (Public Health Scotland 2023).

Participants were asked about their current education level which ranged from no formal qualifications (n=2) to further education (n=5), including bachelors and masters degrees. Nine participants reported having a high school education and five participants reported having certificates such as HND/HNC and other vocational certificates.

At the time of the interview, seven participants were retired, twelve participants were employed; full time (n=6), part-time (n=2), self-employed (n=4), one participant was in higher education and two were unable to work: due to the injury (n=1), permanently sick/disabled (n=1).

The ethnicity of the participants was also collected, with most of the participants reporting White – Scottish (n=12), followed by White – Other British (n=7), White – Irish (n=1), and Other (n=1).

### 4.5.1 Participant Demographics: Location of Residence

#### 4.5.1.1 *Urban Rural Classification of Residence*

As the North of Scotland has varied geography, participants were asked about their residential postcode in the demographic questions at the start of the interview to assess the accessibility of their residence (i.e. rural, urban, or remote) as this could impact on the experiences and services and support available in the local area. Participant's postcodes were compared to the Scottish Government Urban Rural Classification (Scottish Government 2022b). This classification system is based on two criteria: population and accessibility, with the criteria shown in Table 27 (Scottish Government 2022b). The 6-fold classification system was used to assess the participant's location of residence, which distinguishes between urban, rural, and remote regions in Scotland.

**Table 24 - Participant Demographics**

Participant Demographics	(n = 21)
<b>Gender:</b>	
Male	11 (52%)
<b>Age:</b>	
Range	20 – 82 years
Mean (SD)	55.7 years (17.1 SD)
<b>Education level</b>	
No formal qualifications	2
High school level	9
Further education	5
Other (certificate, HND, HNC)	5
<b>Occupational status</b>	
Self-employed	4
Employed full time	6
Employed part time	2
Retired	7
In higher education	1
Unable to work	1
Permanently sick/disabled	1
<b>Ethnicity</b>	
White – Scottish	12
White – Other British	7
White – Irish	1
Other	1

**Table 25 - Participant's Injury Demographics**

Injury Demographics	(n = 21)
<b>ISS range:</b>	
Moderate ( $9 \leq \text{ISS} < 15$ )	10
Major ( $\text{ISS} \leq 15$ )	11
<b>Mechanisms of injury:</b>	
Road traffic accident	8
Fall:	
- from height	4
- stairs	2
Recreational activity:	
- Horse-riding accident	4
- Cycling	1
- Climbing	1
- Skiing	1
<b>Time since injury:</b>	
Range (months)	14 – 25
Average (months)	19

**Table 26 - Location of Residence Demographics**

Location of Residence	(n = 21)
<b>Region in North of Scotland</b>	
Aberdeen City	6
Aberdeenshire	12
Moray	3
<b>Urban Rural Classification</b>	
Large urban	6
Other urban	2
Accessible small town	4
Accessible rural	5
Remote rural	4
<b>SIMD Deciles</b>	
10	6
8	5
7	3
6	3
4	3
1	1

Out of the 21 participants, six resided in a large urban area, which the only area with this population in the North of Scotland is in Aberdeen City region. Two participants resided in other urban areas, four lived in accessible small towns, meaning they had access to an urban area within a 30-minute drive. Nine participants reported living in rural areas; accessible rural (n=5) and remote rural (n=4).

This demonstrates there was a wide range of geographical locations in which participant's recovery experiences took place, ranging from urban areas in Aberdeen City to the remote rural areas of Aberdeenshire. As this research was exploratory, having participants from many geographical locations was beneficial for capturing a wide range of experiences.

**Table 27 - Scottish Government Urban Rural Classification, 6-fold** (used under *Open Government Licence v3.0*)

<b>Classification</b>	<b>Name</b>	<b>Definition</b>
<b>1</b>	<b>Large Urban Areas</b>	Settlements of 125,000 people and over.
<b>2</b>	<b>Other Urban Areas</b>	Settlements of 10,000 to 124,999 people.
<b>3</b>	<b>Accessible Small Towns</b>	Settlements of 3,000 to 9,999 people. Within a 30 minute drive time of a Settlement of 10,000 or more.
<b>4</b>	<b>Remote Small Towns</b>	Settlements of 3,000 to 9,999 people. Drive time of over 30 minutes to a Settlement of 10,000 or more.
<b>5</b>	<b>Accessible Rural Areas</b>	Areas with a population of less than 3,000 people. Within a 30 minute drive time of a Settlement of 10,000 or more.
<b>6</b>	<b>Remote Rural Areas</b>	Areas with a population of less than 3,000 people. Drive time of over 30 minutes to a Settlement of 10,000 or more.

#### *4.5.1.2 North of Scotland Region*

Alongside the Urban Rural Classification, the participant postcodes were also used to determine which council the residential address resided in. This data was collected and reported because participants living in different local areas have different local resources available to them, depending on the local council's health and care partnerships and accessibility of local medical facilities.

Six participants resided in Aberdeen City, twelve lived in Aberdeenshire, and three participants resided in Moray. All participants resided in the NHS Grampian health board area, which means that

the participant experiences are specific and relevant to the local area, therefore relevant to the local services. This also highlights that the findings of this study may not be directly generalisable to other areas of Scotland, for example other areas in the North of Scotland (e.g. Highlands, Islands).

#### 4.5.1.3 Scottish Indices of Multiple Deprivation

The final demographic aspect that participants' postcodes were used to identify was the general socio-economic level of where participant's resided using the Scottish Index of Multiple Deprivation (SIMD) tool (Scottish Government 2020). The SIMD is used to identify areas of relative deprivation in areas in Scotland, considering domains such as income, employment, education, health, access to services, crime, and housing (Scottish Government 2020). This means the SIMD tool is not used to identify whether individuals are experiencing deprivation.

With this in mind, the results from evaluating the participant's postcodes were used to evaluate the relative deprivation of the areas in which the participant's reported residing. Six participants' postcodes were in the least deprived 10%, then eleven participants' postcodes ranked in the middle deciles (i.e. 60 – 80%). Four participants' postcodes were identified to be in the lower deciles (10 - 40%), indicating the highest relative levels of deprivation.

The aim of this research was to hear from a range of participants' different views and use of the SIMD was to see the variation in participants' location of residence. The postcodes ranged from the most deprived to the least deprived areas, but most of the participants (n=17) lived in areas that ranked in the upper half of the SMID index (i.e. above 50% decile). This indicates that this study may not have captured the full range of experiences from those that live in areas that rank lower on the SIMD index.

#### 4.5.1 Participant Demographics: Traumatic injuries

Participant injury demographics are shown in Table 25 and Table 28. The Injury Severity Score (ISS) for participants was collected after the interviews had taken place from the *Rehabilitation Plan Database*, as ISS is not used clinically and was not known to the participants. Participant ISS ranged from 9 – 27, with ten participants sustained moderate trauma (i.e.  $9 \leq \text{ISS} < 15$ ) and eleven sustained major trauma (i.e.  $\text{ISS} \leq 15$ ).

**Table 28 - Participant Demographics: Self-reported Injuries Sustained**

ISS Classification	ISS	Fracture(s) on upper body	Fracture(s) on lower body	Rib fracture(s)	Spinal fracture(s)	Head injury	Abdominal injuries	Chest injuries	Skin damage	Other
Moderate	9						X		X	X
Moderate	9	X	X*			X		X		
Moderate	13	X		X*						
Moderate	13			X*	X					
Moderate	13		X	X*						
Moderate	13		X				X		X*	
Moderate	13	X		X*				X		
Moderate	14		X	X*						
Moderate	14	X	X	X				X	X	
Moderate	14	X*	X*	X						X
Major	16	X		X*					X	
Major	17	X*		X*	X	X			X	
Major	17		X*	X*	X*					
Major	17									X
Major	19				X	X*				
Major	20				X	X*				
Major	22	X*	X*	X*		X				
Major	24	X*		X*	X*			X		
Major	24	X					X	X		
Major	25				X*			X*		
Major	27		X*	X*		X				

*Legend: X – single injury in region, X\* - multiple injuries in region*

Alongside the ISS, participants were asked what types of injuries they sustained from the event (see Table 28). The level of detail participants were able to report for this question varied, with most participants able to give general injury type and body region. The most common type of injury for the participants with moderate trauma were fractures to the upper body (n=5), lower body (n=6), ribs (n=7), and vertebrae (n=1). All participants with moderate trauma reported sustaining multiple injuries (i.e. ranging 2-5 different injury types). Participants with major trauma also often reported multiple fractures, mainly to the vertebrae (n=6) and ribs (n=6), followed by head injuries (n=5), then fractures to upper body (n=5) and lower body (n=3). Participants with major trauma reported a range of injuries from one to five different injury types. Examples of the other types of injuries included whiplash, blood clots in neck, and sciatic nerve palsy.

As these injury descriptions were self-reported, it is important to highlight the variable accuracy of this information, which is why ISS was collected as well to have a more accurate indication of the participant's injury severity, to ensure participants' eligibility for the study (i.e. major or moderate traumatic injuries). The terms in the demographic questionnaire were intentionally descriptive to enhance participant's ability to self-report accurately (APPENDIX R), but this meant that the terms used were different to those that are used on trauma scoring scales (i.e. AIS, ISS) and not directly comparable.

One observation is that five participants with major trauma reported having head injuries (i.e. skull fractures, minor brain bleeds) and one participant with blood clots in neck. Since these participants were not treated under a neurological specialty in the NoS MTC and did not report major neurological injuries or symptoms, they were included in the study. This also highlights the heterogeneity of the traumatic injury population, with the range of types of injuries and number of different injuries.

Another observation from the injury demographics is that often participants reported multiple injuries in the same category (i.e. multiple rib fractures), mainly observed for rib fractures, lower body fractures, and spinal fractures. As ISS is based on location and severity of injuries, it is not surprising that the participants reported having multiple injuries in the same category, with the moderate trauma participants having one to two injuries in the same region (X\* - multiple injuries in Table 28), where major trauma participants had up to three different injuries in the same region, indicating worse severity.

The mechanism of injury for participants were varied, with eight participants sustaining injuries from road traffic accidents (one participant a pedestrian vs car), six participants injured during falls (four participants from a height, two on stairs). The remaining seven participants sustained injuries from

recreational activities: horse-riding accident (n=4), cycling (n=1), rock climbing (n=1), and skiing (n=1).

Participants were recruited over a year after their admission to the NoS MTC, with the aim of exploring perspectives of longer-term recovery. The time the interviews were conducted post-injury ranged from 14 months to 25 months (average 19-months), which was consistent with the recruitment aims. As this was a large time range, it means it was not possible to draw conclusions about experiences at certain stages of recovery (i.e. current stage or experiences one-year post-injury), but this meant that there was a large range of views and participant perspectives from different timepoints during recovery.

#### 4.5.1 Participant Demographics: EQ-5D-5L

The EQ-5D was conducted as part of the interview for 19 participants (two participants not asked, researcher deeming not appropriate, due to participants not answering interview questions or responding to prompting) and data from the questionnaire was collated for the 19 included participants (see Figure 17, Table 29).

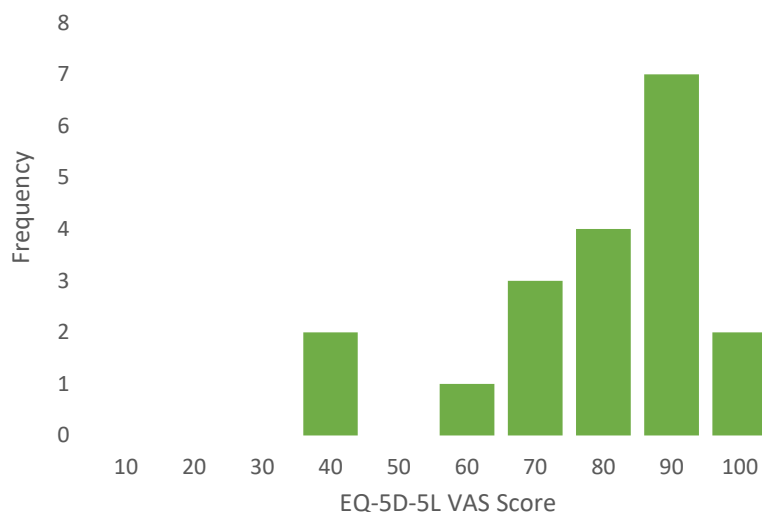
Table 29 displays the descriptive health profile of the included participants. Participants were asked to describe their current health at the time of the interview. Fourteen participants reported slight to no problems across all five domains (74%). The most reported issues included problems with usual activities and pain and discomfort. There were single reports of severe or extreme problems with pain and discomfort, mobility, and usual activities, with five participants reporting moderate to extreme problems in two or more domains.

The EQ-5D VAS values varied, ranging from 40 to 100 (Figure 17). Participants were asked to rate their current health on a scale from 0 – 100, with 100 representing the best health imaginable. Seventeen participants reported their current health to be between 60 - 100. Two participants reported their current health as 40, reported moderate to extreme problems in three or more dimensions in the health profile.



**Table 29 – EQ-5D Health Profile Results**

	<b>Mobility n (%)</b>	<b>Self-Care n (%)</b>	<b>Usual Activities n (%)</b>	<b>Pain/Discomfort n (%)</b>	<b>Anxiety/Depression n (%)</b>	<b>Total percentages</b>
<b>Level 1</b> (No problems)	10 (52.6)	16 (84.2)	7 (36.8)	4 (21.1)	13 (68.4)	52.6
<b>Level 2</b> (Slight problems)	5 (26.3)	2 (10.5)	10 (52.6)	10 (52.6)	4 (21.1)	32.6
<b>Level 3</b> (Moderate problems)	3 (15.8)	1 (5.3)	1 (5.3)	4 (21.1)	2 (10.5)	11.6
<b>Level 4</b> (Severe problems)	1 (5.3)	0 (0)	0 (0)	1 (5.3)	0 (0)	2.1
<b>Level 5</b> (Extreme problems/ unable to do)	0 (0)	0 (0)	1 (5.3)	0 (0)	0 (0)	1.1
<b>Total responses</b>	<i>19 (100)</i>	<i>19 (100)</i>	<i>19 (100)</i>	<i>19 (100)</i>	<i>19 (100)</i>	



**Figure 17 – Frequency Chart of EQ-5D VAS Scores**

#### 4.5.1.1 Use of EQ-5D

The data from the EQ-5D outcome measure indicated that a majority of the participants were reporting minimal impact on health-related quality of life one to two years post-injury. This differs from other studies findings; two systematic reviews of HRQoL following traumatic injuries found that a majority of patients have reduced HRQoL several years post-injury (Silverstein, Higgins and Henderson 2021; Lotfalla et al. 2023). Both these studies identified that overall, that patients with increased ISS (i.e.  $ISS \geq 16$ ) reported poorer HRQoL compared to patients with minor or moderate trauma (Silverstein, Higgins and Henderson 2021; Lotfalla et al. 2023). This was not observed in this population, based on either the EQ-5D VAS scores or individual participant's health profile. This was possibly due to the major trauma scores ranging from 16 to 27, when the maximum ISS score is 75. Other factors that could impact on this is the timing of the interview one to two years post-injury or self-selection bias, discussed in Section 4.8.1. It is also acknowledged that ISS alone is not a reliable indicator of individual patient outcomes or rehabilitation needs (Turner-Stokes 2018; Martino et al. 2020).

Compared to the latest STAG audit data, the health profile data indicate similar trends in that mobility, pain/discomfort, and usual activities are the most commonly reported domains that patients report moderate to extreme problems with post-injury (Public Health Scotland 2023). The EQ-5D data from this study are not directly comparable, as the STAG data was reported at six months post-injury, but this shows that these issues are present for some participants one to two years following the injury. Another point is that many participants reported slight problems with these

three domains, which suggests that these individuals may benefit from further rehabilitation input, regardless of the cause. Reduced HRQoL in traumatic injury populations compared to normative populations has been identified in multiple studies one to two years post-injury (Llaquet Bayo et al. 2019; Tamura, Kuriyama and Kaihara 2019; Angerpointner et al. 2021) with evidence that issues related to reduced HRQoL can have a negative impact up to 15 years post-injury (Silverstein, Higgins and Henderson 2021).

A limitation of the use of EQ-5D in a cross-sectional study is that it was not possible to explore trends in health status throughout recovery, as this would require a longitudinal study design. STAG currently collects HRQoL PROM data (i.e. EQ-5D-5L) from adult patients with traumatic injuries at three time-points post-injury (i.e. before hospital discharge, six months, and one year post-injury) (Dodds and Khan 2020). but the evidence discussed above suggests that this population is at risk for poorer long-term outcomes, so extending the follow up may identify individuals that are at risk of having reduced HRQoL long-term as a result of the injury.

The descriptive data provided from the EQ-5D for this study indicated that the included participants had minimal issues and reported a moderate to high quality of life at the time of the interview, which may have been due to the inclusion of both moderate and major traumatic injuries. This indicates that the qualitative responses of the participants possibly represent those of patients who only have minimal issues at one to two years post-injury, which means that their perspectives may be different to those who experience long term impacts from the injury.

## 4.6 Qualitative Findings

This section presents the qualitative findings from the twenty-one interviews conducted. Using framework analysis, numerous dimensions were identified, which were organised into forty categories based on similarity of meaning. These categories were then grouped further into eleven classes, which were then grouped further into three themes (APPENDIX W). An example of the process of data analysis from dimensions to classes can be found in APPENDIX X. The following sections will discuss the identified themes. Participant quotes are included with a short demographic summary to denote the gender, age range, and ISS classification of the participant.

### 4.6.1 Themes

#### **Theme #1:** *Management of physical impairments and psychological aspects throughout recovery*

Participants described a range of experiences of managing physical impairments, pain, and psychological aspects throughout recovery.

#### **Theme #2:** *Recovery, rehabilitation, and participation experiences*

Participants reported the impact of injury on their usual activities starting with the initial time at home following discharge, then the subsequent functional recovery and rehabilitation experiences. This impact extended to returning to work for those employed at the time of the injury.

#### **Theme #3:** *Support, services, and wider impact of injury throughout recovery*

Participants reported the role of support and access to a wide range of services throughout recovery. The wider impact of the injury on their family was identified, as well as the value of information provision and communication with healthcare professionals.

Figure 18 visually displays the three themes in relation to the ICF framework, indicating the relationship of the themes based on ICF domains. The dotted lines between the domains indicate that there is overlap between the domains as the topics discussed in each theme are not mutually exclusive to that domain. The classes (in italics) that each theme consisted of are presented in the corresponding ICF domain circle. These findings can be viewed in a table in APPENDIX W, including categories, classes, and themes.

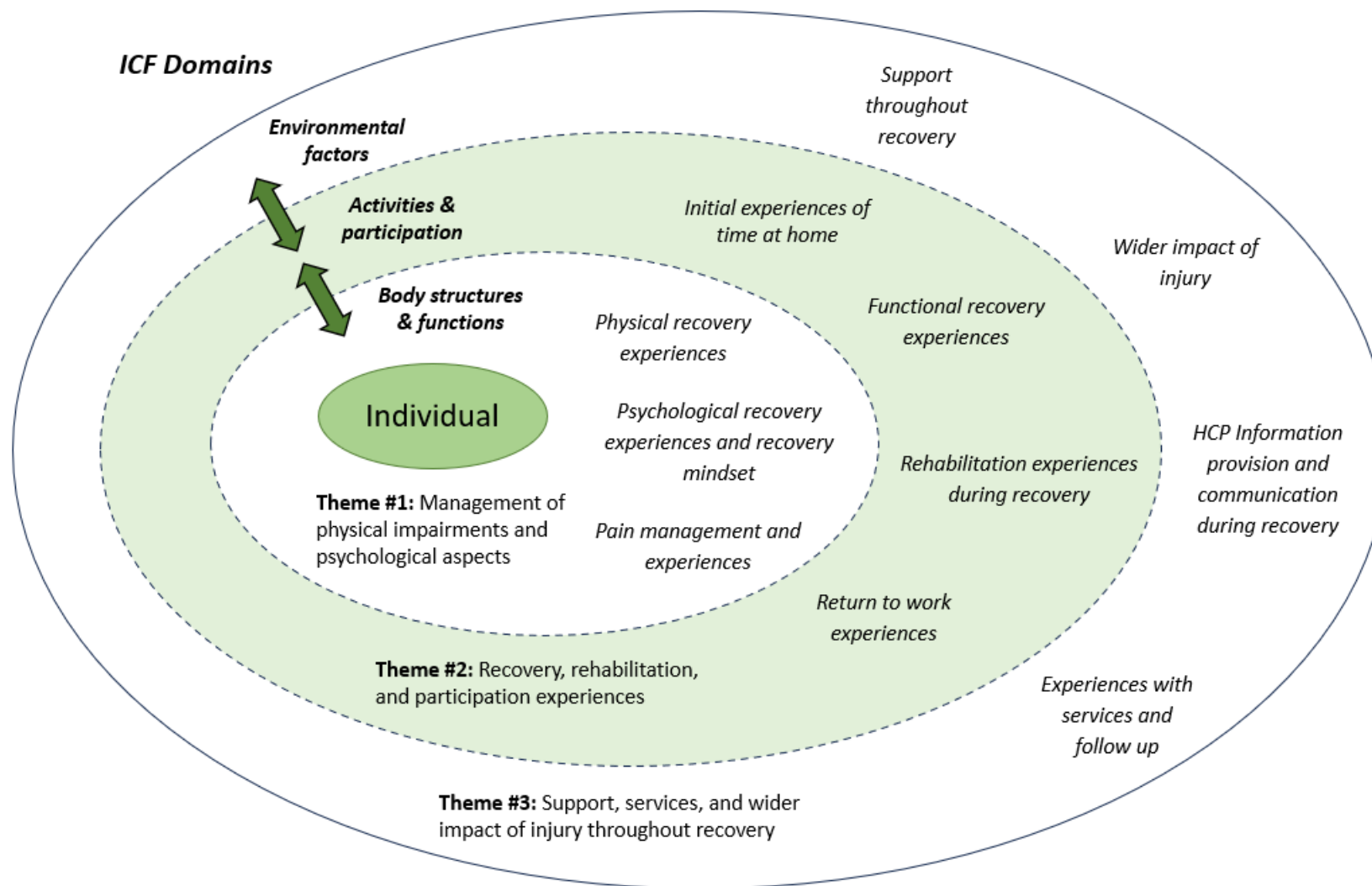
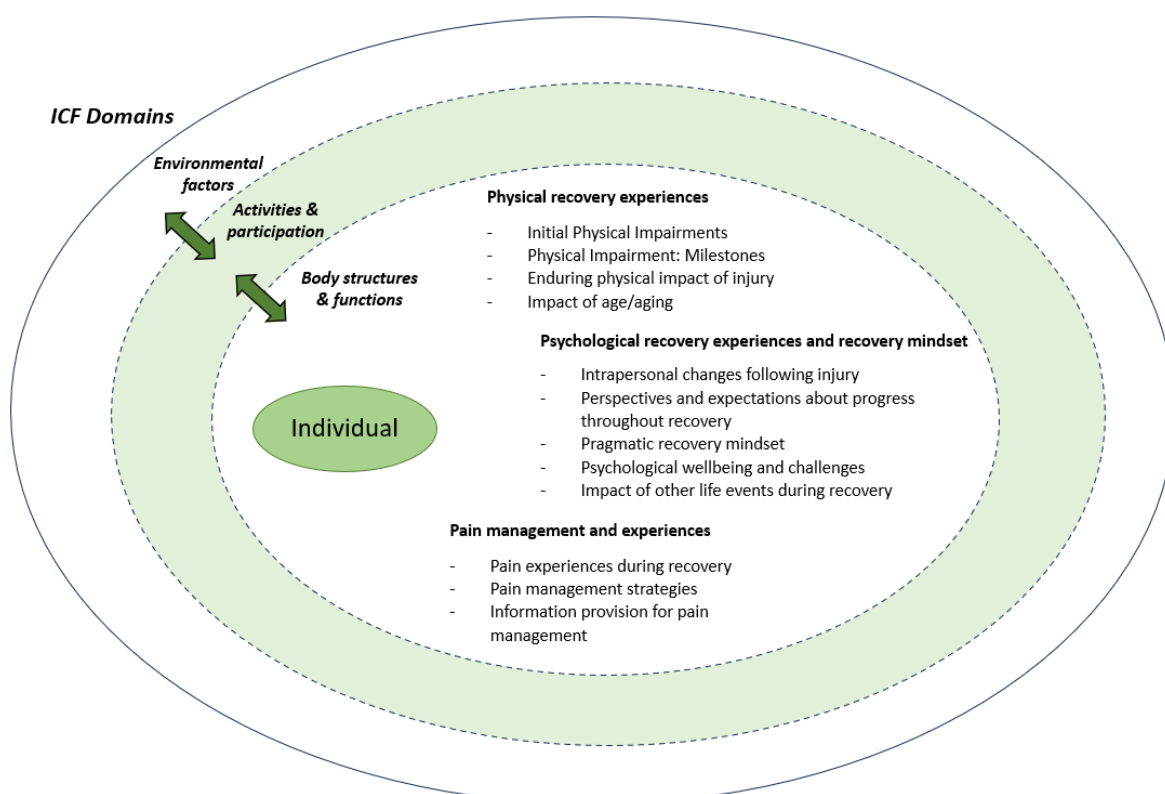


Figure 18 – Qualitative Findings: Themes (bold) and Classes (italicised) data within ICF Framework Domains

**4.6.2 Theme #1:** Management of physical impairments and psychological aspects throughout recovery

Three classes consisting of twelve categories contributed to this theme. This section is presented in three parts, exploring each class in the theme: physical recovery experiences, psychological recovery experiences and recovery mindset, and pain management and experiences. These classes for Theme 1 are shown in Figure 19, along with the respective categories listed for each class. These classes were identified to relate to the “body structures & functions” ICF domain.



**Figure 19 – Theme #1: Classes (bold) and Categories for the *Body Structures & Functions* ICF Domain**

*4.6.2.1 Physical Recovery Experiences*

This class consists of four categories, focused on the physical impairments participants experienced, milestones in the physical recovery, the impact of aging on recovery, and the enduring physical impact of the injury.

**Category:** Initial Physical Impairments

Following from the injury, participants reported restrictions in the movement in their upper body and/or lower body due to injuries and wearing casts or braces. One participant reported they wore a full neck and body brace for around three months after coming home and this severely restricted their movement. For those with injuries in the lower limbs, this meant that they were restricted in how much they were allowed to weight bear on the injured limb, impacting on their ability to mobilise.

*“And obviously I was kind of helpless because I couldn't put any weight on that leg, so I couldn't really get about. And then a full neck and body brace fitted. So equally, I wasn't allowed to - [do] a lot of movement at all.” (Male, 18 – 44 years, major trauma, #13)*

Other initial impairments from the injury included diet, sleep, neurological symptoms, and vision. One participant was on a soft/liquid diet for the first three weeks home. Sleep was affected for some participants, with one participant describing attempting to sleep as ‘unpleasantly uncomfortable’ due to numbness in low back and legs causing challenges to manoeuvre in bed independently. One participant reported having reduced vision initially and required assistance when walking.

*“I did remember it being - the sleeping at night was horrible. I had a very uncomfortable time for the first, oh I don't know, I can't remember how long it went on for ... it was well into [month] before I got anywhere, like, sort of comfortable at night. It was most unpleasant, but it wasn't the Agony of the Damned or anything like that. It was just unpleasantly uncomfortable, you know. You couldn't ever relax or it never seemed to get in the right place or you'd get somewhere and you'd lie there and think, 'Oh, great, it doesn't hurt' and then it would start.” (Female, 65+ years, moderate trauma, #5)*

Initial physical impairments and limited movement were commonly reported as a result of the participants’ physical injuries. A number of participants reported sustaining multiple rib fractures, which are known to impact on patient’s initial function and quality of life (Claydon et al. 2018; Baker et al. 2022), but rib injury-specific experiences were not identified as a main issue for participants, possibly due to the presence of other injuries that also contributed to their physical impairments. These findings indicate that participants’ initial physical limitations were varied due to sustaining multiple injuries, with some requiring immobilisation with casts and braces.

**Category:** Physical Impairment: Milestones

The removal of casts and braces was considered to be a milestone that then allowed participants to resume functional activities. One participant spoke about how they were wearing multiple casts after leaving the hospital, but reported the relief felt with the removal of the casts.

*“The cast was up to my knee, but also had a knee brace fitted on top of that, plus my neck brace. So it was a bittie... It's a bit restrictive, so. It was a bit of a relief to get that [ankle cast] off, but I was still, still wasn't allowed to put any weight on that leg, but at least the cast was off. So it was the first step.” (Male, 18 – 44 years, major trauma, #13)*

The removal of casts signified for some participants the start of getting back to independent activities of daily living (ADLs) such as showering for first time since injury, mobilising, and fine motor activities like writing and crafting. This also signified that some participants were able to start resuming activities like driving and starting the process of returning to work.

*“So, being able to write again was a big plus. Um, which I think that was - well, that obviously didn't happen until [month], when the cast came off. But actually learning how to hold a pen and grip it properly was a challenge as well. I think by Christmas, I was able to do some of the crafts that I'd done before because I was able to hold things properly.” (Female, 45 – 64 years, major trauma, #2)*

*“Pretty much, obviously once the neck brace was off, that's when I started physio. And then I was just trying to ease myself back into work because obviously my job was quite, quite physical, so... It was just trying to pace myself and nae rush things...” (Male, 18 – 44 years, major trauma, #13)*

Multiple participants reported the use of casts and braces, which could be expected due to the high prevalence of fractures in this population (see Table 28). Splinting is commonly used with musculoskeletal injuries to support healing and prevent further damage to the area (Althoff and Reeves 2023). Removal of casts and braces was seen as a sign of progress and that participants' injuries were healing, with the importance of seeing progress is discussed in a later section (Section 4.6.2.2). Communication regarding when casts and braces were to be removed was a challenge for some participants, as discussed in Section 4.6.4.4.

These improvements in physical impairments were observed to be related to participants' functional ability, indicating the relationship between the ICF domains “body structures and functions” and



“activities and participation”, with the improvement in physical impairments associated with improved function and participation, which is discussed further in Section 4.6.3.2.

**Category:** Impact of age/aging

Age and the perceived impact of age on recovery experiences was mentioned in terms of ongoing physical challenges, attributing them to ‘age’ rather than the injury, the speed of recovery, and their current level of health and functioning in context of their age.

Physical challenges, such as pain/discomfort or general physical condition, were sometimes attributed to age rather than the injury. Participants also reflected on the impact that age had on their ability to do activities, such as confidence with driving, fatigue with physical tasks, and their physical endurance.

*“I just have to take things... easy and don't overdo things. I can't push myself like I used to push myself. Perhaps that's the difference. But some of that could be age, obviously.” (Male, 65+ years, major trauma, #15)*

*“It is, especially as you get older, you know, because you feel it. I mean, I know I'm tired of it, too. I've got four grandchildren and my two grandchildren, I look after... And on the days - especially just now with the [teacher] strikes being on, I'm pretty well tired by the time I come home. ... See in your 60s, it was okay. But your 70s, you definitely do slow down slightly. (laughs)” (Female, 65+ years, moderate trauma, #8)*

Some participants commented on how age affected the speed of their recovery and described their current physical condition in the context of their age.

*“And the back pain - I still have back pain now. Um, but I mean, that could be part of the old age as well, because your recovery is much slower, then it would have been if I'd been 20, I think.” (Female, 65+ years, moderate trauma, #9)*

*“So it's amazing how long things take, but they do repair. I assumed when you're old, once you've done it, it's ruined, you know, and you're going to be injured in some way ever since. But - touch wood - both my [previous injury] and the injury you're talking about now have disappeared into the great blue yonder! I have plenty of other aches and pains, but they're not due to any of that.” (Female, 65+ years, moderate trauma, #5)*

These findings are similar to those of the systematic review in Chapter 2 (see Section 2.7.5.1), where several included studies found that older adults perceived that ongoing issues were related to the combination of the injury as well as their age and believed that their age had an impact on the speed and extent of their recovery.

A systematic review exploring health-related quality of life (HRQoL) following polytrauma found that increased age was associated with reduced HRQoL, although this finding was not fully conclusive (Silverstein, Higgins and Henderson 2021). This trend was not observed in this study when considering the EQ-5D data, possibly due to the heterogeneity of the sample population on types of injuries or the inclusion of moderate and major traumatic injuries in the sample population.

Conn et al. explored the experiences of older adults (i.e. 65 years +) following a traumatic injury and found that participants' main aim was to regain their previous functional capacity and lifestyle, participants spoke about a loss of independence and control over important aspects of their life, such as living and working arrangements or need for assistance (2023). Conn et al. also identified that participants did not want to be viewed as 'seniors' or see the need for 'senior-specific care' (2023). This view is an important consideration, especially with the above evidence from this study that some older adults do consider age to impact on their recovery, as well as evidence that having elderly-care specialists involved in the MDT can improve long-term outcomes for older adults post-injury (Duran, Mazzurco and Palmer 2018). Alongside care needs, the need for future research into trauma care for older adults has been highlighted in a UK-based Delphi process study, including topics such as triaging methods of older major trauma patients, the inclusion of frailty screening in the emergency department, and the optimal care environment for older adults with multiple injuries (McElroy et al. 2022).

**Category:** Enduring physical impact of injury

At the time of the interview, some participants reported that some of their physical injuries were healed and not causing ongoing pain or discomfort.

*"And my hand. Physically, it's 100% healed. Not a problem." (Female, 45 – 64 years, major trauma, #20)*

Others reported they were still experiencing physical impairments and symptoms. Some described these to be related to the injury, in the form of ongoing pain and discomfort in the injured areas. Some reported that these did not impact on their daily functioning (i.e. altered drainage in face, reduced hand strength), while others reported more limiting impairments, such as permanent

injuries (i.e. leg-length discrepancy, foot drop, ongoing neurological symptoms, and severe stiffness affecting functional ability).

*“Aye, [slight discomfort] just in movements and lifting. If I'm ever [down] and doing something on my chest, my back will get a bit sore.” (Male, 18 – 44 years, major trauma, #4)*

*“I mean, only what I've just said about the opening [jars], where you need brute strength for certain things. I definitely don't have that anymore.” (Female, 45 – 64 years, major trauma, #2)*

*“The challenges for me really are my - I still have a tingling in my little and ring fingers of both hands.” (Male, 65+ years, major trauma, #15)*

Participants also speculated that the symptoms of pain and discomfort they were experiencing could be due to other factors as well, such as the onset of arthritis in the joint, compensatory movement patterns from other injured areas, from previous or subsequent injuries, or relating to age.

*“No, it's actually my shoulder and my neck. I sometimes do get a bit of pain in there. I don't know if there's a touch of arthritis that's starting in there now. But, you know, just keep it mobile.” (Female, 45 – 64 years, major trauma, #2)*

*“I've already had, before my accident, I had my left hip replaced. And like they said when I had my left one done, 'Oh, your [other] ones gonna need replacing at some point in the future because it's quite bad as well'. I had no pain with it at that time, but like I've noticed that accelerating, just through compensating with my other leg during the recovery process. So my right hip is quite bad now.” (Male, 45 – 64 years, moderate trauma, #14)*

Some participants reported that their appearance changed following the injury, including visible scars and change to facial appearance.

*“Well, my eyes are really sunken in my head and I look a bit different to what I used to look like. Um, my [ ] eye, I don't have any drainage in it, so it runs all the time, especially in the colder weather. But I wouldn't - it doesn't limit me doing anything. It doesn't stop me doing anything at all.” (Female, 18 – 44 years, major trauma, #18)*

Another participant reported negative physical consequences they attributed to the recovery, such as weight gain and relapse into smoking.

*“My main reason for saying that [EQ-5D VAS score] is that I've piled on weight, during this period. And I had been a non-smoker for quite a while, although I vape and I have occasionally relapsed into smoking a few cigarettes now and again. Not consistently, but maybe every month or two or something like that since, I think that, in along with the weight increase and everything. I could definitely, even with the injuries, feel a lot better than I'm feeling at the moment for sure.”*

*(Male, 45 – 64 years, major trauma, #19)*

Aside from the impact of the injury, some participants also reported that their current physical challenges were caused by related previous or ongoing medical conditions and required ongoing medical input.

*“And they very kindly X-rayed my ankle as well, because that'd been playing me up. But we decided it was nothing to do with the accident and it's not arthritis and it's still being a blooming nuisance...” (Female, 65+ years, moderate trauma, #5)*

Participants in this study reported experiencing ongoing physical limitations at the time of the interview. These findings are similar to those from other studies, with participants reporting physical limitations and injury-related disability at 12 months post-injury and beyond (Gabbe et al. 2011, 2016; Visser et al. 2021). A systematic review on HRQoL of adults with polytrauma identified that lower limb injuries were associated with more physical limitations and decreased general HRQoL, due to the functional limitations experienced (Silverstein, Higgins and Henderson 2021). This appears to be similar to the findings of this study, as injuries to the lower limbs were mentioned to be more functionally limiting (i.e. foot drop and leg-length discrepancy affecting gait).

A systematic review by Ekegren et al. (2018) identified that patients with serious orthopaedic injuries were not meeting physical activity guidelines, with low physical activity levels measured at all time points following the injury (up to two years post-injury) and high levels of sedentary behaviours. Increased sedentary time was found for participants that had sustained both upper and lower limb fractures, totally an average of 80 – 90% of the day (Ekegren et al. 2018). A follow-up study exploring the long-term physical activity participation of patients with major trauma three to five years post-injury found “significant and persistent physical activity restriction” after their injury (Ekegren et al. 2020 p. 188). This study did not measure physical activity, but participants did speak about the frustrations of not being able to do their usual activities during recovery, due to the physical

impairments (Section 4.6.3.2). Due to the known risks of increased mortality and chronic disease associated with reduced physical activity (Ekelund et al. 2016), it is essential that individuals receive adequate rehabilitation following traumatic injuries to minimise the enduring physical limitations from the injury.

Participants in this study also reported that not all their enduring physical limitations were directly related to the injury. The previously mentioned systematic review also found that patients with pre-existing physical conditions reported greater physical limitations compared to those that reported no issues prior to the injury (Silverstein, Higgins and Henderson 2021). Physical limitations from the injury and any other prior or subsequent health conditions should be considered by HCPs throughout recovery and managed appropriately, as the goal of rehabilitation is to deliver person-centred care (Scottish Government 2022a).

#### 4.6.2.2 Psychological Recovery Experiences and Recovery Mindset

This class consists of five categories, relating to the intrapersonal and psychological aspects of the participants' recovery experiences.

##### **Category:** Intrapersonal changes following injury

Following the injury, participants described changes to their behaviours and activities. Activity modifications were mentioned throughout the recovery process. Early in recovery, activity modifications included positioning for rib fractures or taking a cautious approach to increasing weight bearing on the injured leg. One participant spoke about how it was challenging for them to modify their behaviour to match their current physical abilities, but through recovery learned to *“just chill and take things easy sometimes”* (Male, 18 – 44 years, major trauma, #13). This challenge was mentioned throughout recovery and others spoke about the negative consequences of doing too much.

*“People who know me say I just push myself, sort of all the time. So I think I tried to do too much, too quickly and didn't actually accept I had, you know, sort of perhaps been affected by it. And then it kind of all caught up on me and the tail end of last year, um, and fell apart a bit.”* (Female, 45 – 64 years, major trauma, #21)

Another adaptation that was mentioned was diet and the role of diet in recovery. Participants spoke about changing their diet to match their reduced activity level during recovery and eating home-cooked food and protein shakes with collagen to improve their recovery.

*“My bruising had disappeared and everybody commented saying, 'Oh, wow, you've made such a speedy recovery'. And I genuinely think it was because I was giving my body what it needed to recover. You know, I was aiding it [with] proper food.” (Female, 18 – 44 years, major trauma, #18)*

Some activity changes were described positively with using projects to stay busy throughout recovery, such as continuing to manage their business from home, starting a new business, and restarting a prior cognitive behavioural therapy (CBT) intervention. One participant described the injury as a ‘life changing event’ because it caused them to reflect on their life and role in work and were able to make positive changes, including reducing the amount of time they were working following the injury.

*“They say these things are life changing events. And in my case, it truly did change my life because, you know... Well, it made me reflect on all these things and the conclusions that I came to informed how I'm doing things now. So it's certainly been very helpful from that perspective.” (Male, 45 – 64 years, moderate trauma, #6)*

At the time of the interview, some reported that they were still adjusting their behaviour and activities, as they were not able to push themselves physically as compared to before the injury and had changes to their personal routine following the injury (i.e. retirement, change in activities). One modification that multiple participants mentioned was needing to pace activities.

*“I only try to do one major thing per day, like a vacuum. ... As long as I just do one major thing in a day, I can manage. Like I couldn't say, 'Right, tomorrow, I'll do this in the morning and that in the afternoon'. I need some time, that's what I feel like.” (Male, 65+ years, moderate trauma, #7)*

Following on from the physical limitations, participants in this study reported multiple changes they employed during their recovery, relating to activity modifications, diet, and staying busy with manageable tasks.

Participants reported experiencing ongoing challenges with adjusting their behaviours and activities to their current ability throughout recovery. This could be due to the non-linear aspect of recovery,

identified by Norris et al. (2023), where individuals are continuously adjusting to changes in their physical, psychological and socio-functional abilities throughout the recovery process. This process was also identified in a study by Claydon et al. where participants with major orthopaedic trauma underwent a process of adjusting to a “new post-trauma self” (2017 p. 327).

An interesting observation from the interviews was that the perceived impact of diet on recovery was mentioned by several participants. Participants reported wanting to know more about how they could enhance their recovery with dietary changes, but none reported receiving specific information on dietary recommendations. This is possibly an area that has been overlooked in this population previously, as most of the literature on dietary requirements for injury recovery has been focused on the athletic population (Tipton 2015; Close et al. 2019; Smith-Ryan et al. 2020). One review on nutritional support for elective orthopaedic surgery identified that patients could benefit from tailored nutritional education at discharge from hospital (Briguglio et al. 2019). Further nutritional advice or signposting of resources could be beneficial for this population, as these findings indicate an interest from participants.

Activity modifications are discussed further in Theme #2 and how that related to participants’ functional ability and resuming prior activities (see Section 4.6.3.2).

**Category:** Perspectives and expectations about progress throughout recovery

Observing progress throughout recovery was considered important. Examples of progression were mentioned in relation to regular scans during follow up appointments, reflecting on levels of pain and appetite, and using a diary to note down dates and aspects of recovery like pain, analgesia use, sleep, function, and activities.

*“And as the physical side improved, which probably could look at my diary and tell you... On the [date], I've made a note, 'Had a good sleep, no painkillers at all today. Still I'm a little sore. Well, a bit sore, but no painkillers taken'.” (Female, 45 – 64 years, moderate trauma, #1)*

*“It doesn't upset me at all because I have actually put down - there's smiley faces and there's sad faces. So, you know, it's all part of - It is all part of the recovery” (Female, 45 – 64 years, moderate trauma, #1)*

Conversely, not seeing progress was reported to be a challenge throughout recovery. Participants described that this occurred when there were delays (i.e. delay in removing casts), setbacks (i.e.

needing subsequent surgeries/interventions, variable ability day-to-day), and from the length of recovery (i.e. fracture healing time, months of not seeing progress).

One participant described never really feeling down during the first part of recovery, as they were expecting it to take time. They reported experiencing challenges when they experienced setbacks and their physical injuries required further surgery.

*“... I think psychologically, I think I was quite fine with everything until I realized - you started to suspect that, 'Oh, this isn't going as well as it should'. And then when you realize that you have to have another operation, or you even begin suspecting that, then your mood drops.” (Male, 45 – 64 years, major trauma, #19)*

Some participants recalled that they expected the recovery process to take time, with fracture healing mentioned as the perceived main cause for the length of recovery. One participant reported that they were surprised at the length of time it took to heal and expressed frustration as they were used to being more active. This was exacerbated by also not having a straightforward recovery of their symptoms.

*“... it was just the length of time it takes is like quite frustrating. You know, it's difficult if you're not used to it and used to being a lot more active than you can be after, something that happens like that. It's a wee bit frustrating, but like, the overall process has been good, you know.” (Male, 45 – 64 years, moderate trauma, #14)*

Participants also spoke about their expectations about their recovery. Some reported having an optimistic outlook, seeing their health as always improvable and still seeing progress and improvement in their recovery. Some participants reported a less optimistic outlook on their expected recovery, due to their ongoing symptoms and physical impairments (i.e. pain, permanent physical injuries) and based on information from HCPs (i.e. independent medical assessor shared that “[they] didn't think I will fully, fully recover from this” (Male, 45 – 64 years, major trauma, #19)).

When experiencing challenges with recovery, having realistic expectations was beneficial.

*“... with my kind of injury, 18 months to two years after the event, whatever pain you're in at that point will be the pain level that you're probably pretty much have to deal with. So I'm okay with that, because now I know - you know, I think I was always a bit frustrated that I wasn't getting better, but now I know I just have to put up with it. And I think something changes in your head when you know that. So I'm okay.” (Female, 45 – 64 years, major trauma, #20)*



At the time of the interview, some reported they were still recovering and actively engaging with rehabilitation services. Others reported feeling content with their recovery and current health status - *"I don't think I could have recovered better or quicker"* (Male, 65+ years, moderate trauma, #11). Some reported they were back to their 'normal', but expressed some uncertainty around what 'normal' meant; *"I think I'm kind of back to normal, whatever normal is."* (Female, 45 – 64 years, major trauma, #2). Others reported that their recovery was not complete, but were no longer actively engaged in formal rehabilitation services.

*"Because I mean, I'm still at a point, I'm still like - It'll be two years in [month] and there's still quite a bit of like, mobility that I have to work on yet, you know. But as far as like the stuff from the hospital, that's me finished now, isn't it?"* (Male, 45 – 64 years, moderate trauma, #14)

These findings highlight the importance of observing progress throughout recovery and the impact this had on participants psychological wellbeing. For some participants, observable progress was not seen due to the length of healing, setbacks, or the need for further surgeries, which they reported impacted their mood.

One traumatic injury-specific resource for observing progress throughout recovery is the *AfterTrauma Recovery* app. The associated website, *AfterTrauma*, was launched in 2015 in the UK to provide survivors of traumatic injuries and their family/carers with information and resources on recovering from traumatic injuries (AfterTrauma 2024). The free *AfterTrauma Recovery* app was introduced in 2019 and is based on the principles of supported self-management and includes a recovery tracker, a place to record goals and personal notes, as well as a place to upload pictures of rehabilitation plans (AfterTrauma 2024). This app is known to the clinicians at the NoS MTN and these findings indicate that clinicians should continue to signpost methods of tracking progress to patients and family/carers. These findings suggest that future research could use mixed method research strategy to explore the use of digital technology such as the *AfterTrauma Recovery* app or similar progress-tracking apps to support self-management and evaluate the impact on patient outcomes throughout recovery.

The idea of observable progress also ties in with the participant's expectations of recovery. Participants in this study valued receiving realistic expectations of symptoms and wanted to know the prognosis of their injuries, similar to the findings of other studies (Bridger et al. 2021; Visser et al. 2021; Norris et al. 2023). It has been identified that recovery for patients with traumatic injuries is not always linear and straightforward and HCPs have an important role in assisting with setting realistic expectations (Claydon, Robinson and Aldridge 2017; Norris et al. 2023). The way that this

information is communicated with participants was also important and is discussed further in Section 4.6.4.4.

**Category:** Pragmatic recovery mindset

The mindset that participants brought to the recovery process was mentioned as an important factor.

Participants spoke about how they felt grateful to be alive and for their recovery. Some also acknowledged how their injury could have been worse. One participant said, *"I'm never going to be back to what I was before... But no, I'm still here"* (Female, 45 – 64 years, major trauma, #10).

Participants used the phrase 'get on with it', suggesting the adoption of a pragmatic mindset and the participants' motivation to 'get on' with their life following the injury. Participants acknowledged the importance of having the 'right' attitude or mindset for a successful recovery. This was mentioned in relation to the importance of having an active role in their recovery by doing everything they could to help their recovery.

*"... it was just important for me to, to work at it. And people don't just get better because the health service providing you stuff. Yes, okay, you can't do heart surgery on yourself or anything like that, but we can all do an awful lot to... to make our own lives better."* (Female, 45 – 64 years, moderate trauma, #1)

Motivation for recovery varied between participants, with some having specific goals, such as regaining their previous fitness and health or to be able to do physical tasks that were required for continuing with their career. Others did not mention specific motivations for recovery and instead talked about the role of staying busy throughout the recovery process by spending time with friends, engaging in rehabilitation activities, or taking up a caring role.

*"...[grandchild's] seen me through a lot of this, to be truthful. And looking after [them] has been a Godsend. And it saves me dwelling on things that weren't so good."* (Female, 65+ years, moderate trauma, #9)

In this study, participants spoke about recovery in a pragmatic manner, using phrases like "get on with it". This pragmatic outlook to recovery was identified in other studies (Claydon, Robinson and Aldridge 2017; Murray et al. 2019; Brown et al. 2020) and for some participants, this could be due to the fact that they did not perceive the injury event to be traumatic (*"I don't need counselling, I fell off a horse!"* (Female, 65+ years, moderate trauma, #5)). For others, this may have been due to their current stage of recovery and relate to the phenomena of "Post-Traumatic Growth" (PTG). PTG refers

to “positive psychological changes experienced as a result of the struggle with trauma or highly challenging situations” (Tedeschi et al. 2018 p. 2). PTG is not an alternative to psychological challenges (e.g. PTSD) individuals may experience during recovery, but instead a process that occurs alongside the psychological challenges throughout recovery and leads to positive personal growth (Sanki and O’Connor 2021; Dell’Osso et al. 2022). Psychological services have a role to play in facilitating PTG, as there is evidence that psychosocial interventions (i.e. CBT, written or spoken self-expression) can enhance PTG in individuals following hardship or trauma (Roepke 2015).

**Category:** Psychological wellbeing and challenges

Some discussed the psychological changes and challenges they experienced following the injury. One participant found that the injury affected their sense of identity, as it changed their role in work and in their family and described a disconnect between “*the way I looked and felt in my head and what was actually my physical reality now*” (Male, 45 – 64 years, moderate trauma, #6). Another participant reported feeling like they had fundamentally changed following the injury event and described the long-term effect of the trauma.

*“I think the trauma is the harder bit to get over, isn't it? ... But as soon as I start talking about it, I can actually feel, um, my my voice quavers and my eyes start to fill up. And I think that's really weird that isn't it? Because on the whole you think you're okay. But honestly, it's the effect of trauma I think is long, is long lasting.”*

*(Female, 45 – 64 years, major trauma, #20)*

Some psychological challenges were experienced in the initial time after leaving the hospital (i.e. flashbacks, affected sleep), but others presented later on in recovery. Some participants mentioned psychological challenges in relation to resuming the activity they were doing at the time of the injury (i.e. driving, horse riding, cycling).

*“...over that period of time, I trying to get back into riding [the horse], I never thought I had any sort of residual fear or anything like that, but it became clear that I did. And ultimately I had to stop riding about the end of [month] because I was, um, I just couldn't cope. My nerves and anxiety were just through the roof.”*

*(Female, 45 – 64 years, major trauma, #21)*

One participant reported that as their physical ability and independence improved, being outside and around traffic triggered traumatic thoughts, leading them to avoid going outside. They reported accessing neuropsychology, which helped improve initial anxieties using gradual exposure

techniques, but then had further psychological challenges later in the year with the change in seasons and decrease in light, triggering their anxieties again.

*“They [HCPs] appreciate that these things can take a long while and that my [neuropsychology] sessions were, two sessions and I said 'Yes, I'm cured.' And they were sorta 'Really, after all that time?' I said, 'Yeah, yeah, I'm absolutely cured, no problems.' But it maybe wasn't cured and that triggered me again when it was dark at that point.” (Female, 45 – 64 years, moderate trauma, #1)*

Participants who described experiencing major psychological challenges also spoke about accessing psychological support, in the form of the NHS neuropsychologists, private psychologists/therapists, GPs, and neuro-linguistic programming experts. Some had ongoing psychological input at the time of the interview.

The prevalence of psychological challenges following traumatic injuries have been long established (van der Sluis et al. 1998). Following a polytrauma injury, individuals are at risk of developing anxiety, depression, and PTSD, which can affect patients' HRQoL for as long as 10 years post-injury (Silverstein, Higgins and Henderson 2021). Finstad et al. (2021) identified that participants with severe trauma reported experiencing psychological reactions and emotional distress following their injury, due to social, financial, and/or physical losses during the trauma event.

Based on EQ-5D-5L data collected, several participants in this study reported experiencing slight to moderate problems with anxiety and/or depression at the time of the interview. Participants described experiencing psychological challenges at different times throughout recovery, such as flashbacks and affected sleep early on, or later experiencing challenges resuming the activity they were doing at the time of the injury (i.e. driving). Participants in this study suggested that near hospital discharge, providing information on the psychological challenges they may experience in the months following the injury could have been useful to prepare them, such as providing resources and practical coping strategies.

Where other literature has previously identified a lack of psychological support for individuals following traumatic injuries (Christie et al. 2016; Kettlewell et al. 2021; Olive et al. 2022), this was not identified in this study, with all participants who reported experiencing psychological challenges describing that they received psychological support when they needed it. This confirms the importance of the link between the trauma service and the ongoing access to psychological services to support patients throughout their recovery.

**Category:** Impact of other life events during recovery

Due to the unexpected nature of most traumatic injuries, participants spoke about other events that were happening in their life that impacted on their recovery experiences. One participant spoke about resuming the caring role for their unwell spouse early in recovery which impacted on recovery: *“I think the recovery was slow, physically and probably caused by mental stress, I would say”* (Male, 65+ years, moderate trauma, #7). Several participants experienced a bereavement in their family during their recovery. For some, this required travelling outside of Scotland soon after leaving the hospital.

*“And I made a journey on the train, much to everybody's horror, (laughs) to go down to [England] to see [the family member]. But I made it. I was able to, you know, sort of be helped on to a train and helped off a train. So that was quite a, um, a significant time.”* (Female, 45 – 64 years, major trauma, #21)

Several participants spoke about experiences with the police following discharge from the hospital, related to the event of the injury for one participant.

*“... and so that's what happened. And I was talking to the police afterwards. Obviously didn't talk to me, they'll wait til I go home from hospital.”* (Male, 65+ years, moderate trauma, #7)

These life events were spoken about as part of the participant's recovery story. Difficult events like family bereavements were an additional challenge for participants, at a time when they were managing other physical, psychological, and functional aspects of recovery as well. The impact of other life events on recovery experiences was identified in another study exploring caregivers' experiences following serious orthopaedic trauma (Newcomb and Hymes 2017). The authors noted that all the caregiver participants described complex challenges that impacted their family throughout the recovery, such as multiple family members injured in the event and loss of job and health insurance (Newcomb and Hymes 2017). The impact of other life events is not commonly reported in other similar studies in the traumatic injury population, possibly as it may not be the main aim of the research, but was a notable findings for this study. The impact of other life events is something HCPs should consider when providing care, and also indicates the importance of accessible psychological services throughout recovery.

#### 4.6.2.3 Pain Management and Experiences

This class consists of three categories, focused on participant's experience of pain throughout recovery, pain management strategies, and information provision regarding pain management.

**Category:** Pain experiences during recovery

Multiple participants described experiencing pain initially of discharge from hospital and the initial time at home. The initial time after leaving the hospital was described by several participants to be when the pain was at its worst, one person describing their whole body felt sore on discharge from hospital. One participant reported experiencing severe pain after leaving the hospital due to changes in analgesia. Only one participant reported not experiencing any pain on discharge from acute care.

*"No, there was there was no equipment at all given to me. I was wheelchaired down to the exit and got into the car. And that was - I don't think I even had a crutch or anything like that. There was a lot of pain, obviously, with all this. And, I mean, I sort of managed that pretty much myself." (Male, 65+ years, major trauma, #15)*

*"But I would say, probably by middle of [month], so probably about a month after that, I was becoming much more mobile - still in a lot of pain." (Female, 45 – 64 years, major trauma, #21)*

Throughout recovery, participants' pain experiences varied. Participants reported experiencing pain when changing positions, like sitting up in bed and walking. Another participant reported that they used pain to test the boundaries of their ability.

*"I'd suddenly realize that I'd pushed it slightly too far and so it would be in pain for a few days. But then it seemed to make it stronger as well, so yeah." (Female, 45 – 64 years, major trauma, #2)*

Some participants reported their pain improved gradually. One participant described that initially, their pain was improving, but then worsened again six months after their injury and led them to request a review follow up meeting.

*But in terms of the initial recovery, it was you know, it was more severe when I first came home, but it eased off quite fine. And as I say, it's just when it started*

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*regressing in the summer, it began to get more painful again. (Male, 45 – 64 years, major trauma, #19)*

At the time of the interview, multiple participants reported that they were still experiencing pain from the injury. This ranged from the report of occasional back pain to others reporting extreme pain and requiring analgesia for daily activities.

*“Yes, there's pain, there's still pain and I don't think that's going to go away.”  
(Female, 65+ years, moderate trauma, #9)*

*“And it's painful transitioning - So sitting here, I'm quite comfortable. But as soon as I go to get up, it will be quite painful. So it's getting in and out of the cars, kind of pretty, pretty painful as well. So there's always pain about.” (Male, 45 – 64 years, major trauma, #19)*

Participants also reported experiencing pain that was unrelated to the injury, with some requiring regular analgesia (i.e. Tramadol, naproxen).

*“Oh, it's a plate in the forearm, grinding against the bone. ... it's nae just a noise. It's there. Extremely painful.” (Male, 18 – 44 years, major trauma, #16)*

The experiences of pain in the early stages of recovery for patients with traumatic injuries has been reported in multiple studies (Goldsmith, McCloughen and Curtis 2018; Baker et al. 2021, 2022; Finstad et al. 2021; Grzelak et al. 2022). In this study, participants reported differing experiences of pain, with some describing pain to gradually improve, and others reported variable pain was variable throughout recovery. This is similar to the patient experiences in other studies (Sloney et al. 2014; Samoborec et al. 2019; Brown et al. 2020).

Based on EQ-5D responses, many participants reported experiencing problems with pain and discomfort at the time of the interview (78.9%), ranging from slight to severe problems. Some participants reported that this pain was due to other factors, such as subsequent or unrelated injuries, but some were still experiencing pain from the injury and indicating presence of chronic pain. Chronic pain is defined as any pain that lasts or recurs for longer than 12 weeks (Treede et al. 2019; Arnott 2023) and individuals with traumatic injuries are recognised to be at increased risk of developing chronic pain (Evans et al. 2022). Chronic pain is associated with psychological challenges and increased disability and has been observed in traumatic injury populations up to three years post-injury (Jenewein et al. 2009; Clay et al. 2012). Healthcare professionals should consider ways to

address pain management when providing care throughout recovery and be aware of the impact of chronic pain on patients' functioning and HRQoL.

**Category:** Pain management strategies

Multiple participants reported that their pain was managed adequately after hospital discharge, mainly with use of analgesia. Multiple participants reported using opioid analgesia, such as dihydrocodeine and co-codamol, as well as paracetamol. Others relied instead on managing their pain through pacing activities and listening to their body and using non-pharmacological methods as well, such as massage, physiotherapy, and online consultations.

*“As I say, I just listened to my body and if I needed to slow down, I just slowed down and I had a seat and I would tackle whatever it was in my own time and I got through it that way. That's the way I've always been.” (Female, 65+ years, moderate trauma, #8)*

*“There was [lots going on the first year], and it was really just related to my how uncomfortable I was. Mainly across my back, my arms, my shoulders. I had massages, I had visits to physio through that time to try and improve it. I had online video meetings, as it were, to try and improve me. I had exercises given to me throughout that time, which I tried to stick to. But as I said, I presume that was just the period of time when it was actually healing itself.” (Male, 65+ years, major trauma, #15)*

Some participants described a negative perspective towards taking medications for pain management, with some reporting that they 'didn't like taking medications', refused to take any pain killers home from the hospital, and that they did not want to rely on them. Even for those that did not want to take pain medications, they reported experiencing pain that warranted taking the medications.

*“So yeah, I knew I had the really, really strong ones. And not to be able to take too many of those, but they also said, 'Take them. That's what they're there for. You will be in a lot of pain for a long time'. They did warn me that, that I would need to take them. And don't - don't be brave and try not to take them. You need to take them. Which I did. But I'm not, I'm not really one for taking medicine, you*



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*know... The pain that I was going through was enough to make me able to take these things.” (Female, 45 – 64 years, moderate trauma, #1)*

One participant reported that they tried to avoid taking painkillers, but did use them as needed. This participant also described experiencing side effects such as affected appetite due to the medications.

*“So again, that [painkillers] was something I didn't want to rely on. I was trying not to take too many painkillers because I knew if I did that, there was a chance that I would end up not enjoying my meals, my breakfasts and lunches. So I tried to avoid taking the painkillers. Some days it was - you had no choice because I was still a lot of pain and I still had to function, and I did, you know. I wasn't being a martyr anybody. You know, I needed to take hit of... [cocodamol], I did. I just never thought twice.” (Male, 45 – 64 years, moderate trauma, #17)*

Multiple participants reported that they were given medication from the hospital on discharge and then contacting their GP for repeat or updated prescriptions. Some participants described challenges to accessing medication during their recovery while away from their local GP.

*“When I went down to my [family]'s at the end of [month], I didn't actually expect to be down there very long. And I ended up being away for about maybe two and a half weeks and I ran out of dihydrocodeine, and suddenly ran out of it and I tried to get an emergency - But because the NHS in England, they just, they wouldn't do anything. It was really difficult. Um, and so, yeah, that was hard because, yeah, I really struggled without it.” (Female, 45 – 64 years, major trauma, #21)*

With weaning off analgesia, some reported no issues in weaning off the opioid analgesia independently. Some found it more challenging, with one participant reported difficulty sleeping while weaning off the medication. One participant reported experiencing severe ongoing pain for two months while attempting to cut back on analgesia.

*“By the time I left hospital, I was on just dihydrocodeine and I stopped taking that relatively quickly, I'd say within the first, maybe a month after leaving [hospital].”  
(Female, 18 – 44 years, moderate trauma, #3)*

*“Well, yeah, it [weaning] was quite difficult actually, because I just kept getting really [jittery], which sounds terrible. And the ... [dihydrocodeine] originally helped me sort of sleep as well. And I found I was unable to sleep and I was getting really restless legs and such. So yeah, when I was coming off, I came off it really slowly*

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*and started breaking tablets in half and you know, sort of to help that transition. Yeah, I can imagine how it's very easy to get hooked on them.” (Female, 45 – 64 years, major trauma, #21)*

Participants mainly spoke of using pharmacological pain management in the form of opioids on discharge from hospital. This is consistent with accounts in the literature where opioid analgesia is a common pain management strategy prescribed to patients following traumatic injuries (Chaudhary et al. 2017; Finstad et al. 2021; Grzelak et al. 2022).

Participants in this study reported having negative perspectives on taking ‘strong’ medications. One participant reported learning about the dangers of addiction on their own during the weaning process. Finstad et al. identified a similar trend in that participants reported they that lacked information on weaning off opioid analgesia researched information on the internet and try weaning off on their own due to fear of dependence (2021). In other studies, participants reported their knowledge and perceptions on pain management came from the internet, media, and family and friends (Goldsmith, McCloughen and Curtis 2018; Finstad et al. 2021). This highlights an area where HCPs could provide education and answer questions patients may have to improve their self-management.

In this study, participants reported using non-pharmacological methods for pain management, such as pacing physical activity, massage, physiotherapy, and online consultations. Other studies have found that some adults with traumatic injuries prefer to use non-pharmacological strategies, or a mix of both (Grzelak et al. 2022). Several studies mention that participants experimented with and implemented non-pharmacological strategies on their own (e.g. cushions, heat packs, rest, physical positioning, massage, diversionary activities) (Goldsmith, McCloughen and Curtis 2018; Finstad et al. 2021; Grzelak et al. 2022). Due to the varied perspectives, patients would benefit from resources for pain management to enable supported self-management (i.e. information for pharmacological, non-pharmacological strategies, and weaning plan for opioids).

**Category:** Information provision for pain management

Information provided to participants on pain management varied. One participant reported they were given information about the use of analgesia in hospital and advised that they would need to take it on discharge. Another participant was given information on weaning off the opioid medication

when asking for a refill from the pharmacy, which they found helpful. Another participant reported they had prior knowledge of pain medications from their role as an HCP.

*“They were all explained to me. They all made sense at the time and they knew which ones was which and what I had to take and then so. They were, they were excellent in the hospital to provide all of those things for me, which was, which was great.” (Female, 45 – 64 years, moderate trauma, #1)*

*“I'd asked for more dihydrocodeine [at doctor's surgery]. And actually, the pharmacist at the surgery rang me up. And asked me how I was taking them. And [they] did say, [they] goes, 'Yes, I do appreciate that you need them because of the pain that you're in. But you need to start weaning yourself off them'. So I did actually, after they gave me those ones, they gave me a repeat prescription for them. I started weaning myself off.” (Female, 45 – 64 years, major trauma, #2)*

Another participant reported that they were not given information, but learned about the risks of pain medication addiction through their own research.

*“I think when I struggled without it [dihydrocodeine], I started to read up about that and, you know, sort of in how I should come off or how you could become addicted. Because I couldn't understand how I was feeling, you know, it was just like, ooh, really... Yeah, I think I did that myself, actually. I don't know how long they would have continued to give it to me on prescription had I still been asking for it. But eventually I weaned myself. But yeah, that would - probably some help thinking about that, you know, sort of preparing me for that, might have been useful.” (Female, 45 – 64 years, major trauma, #21)*

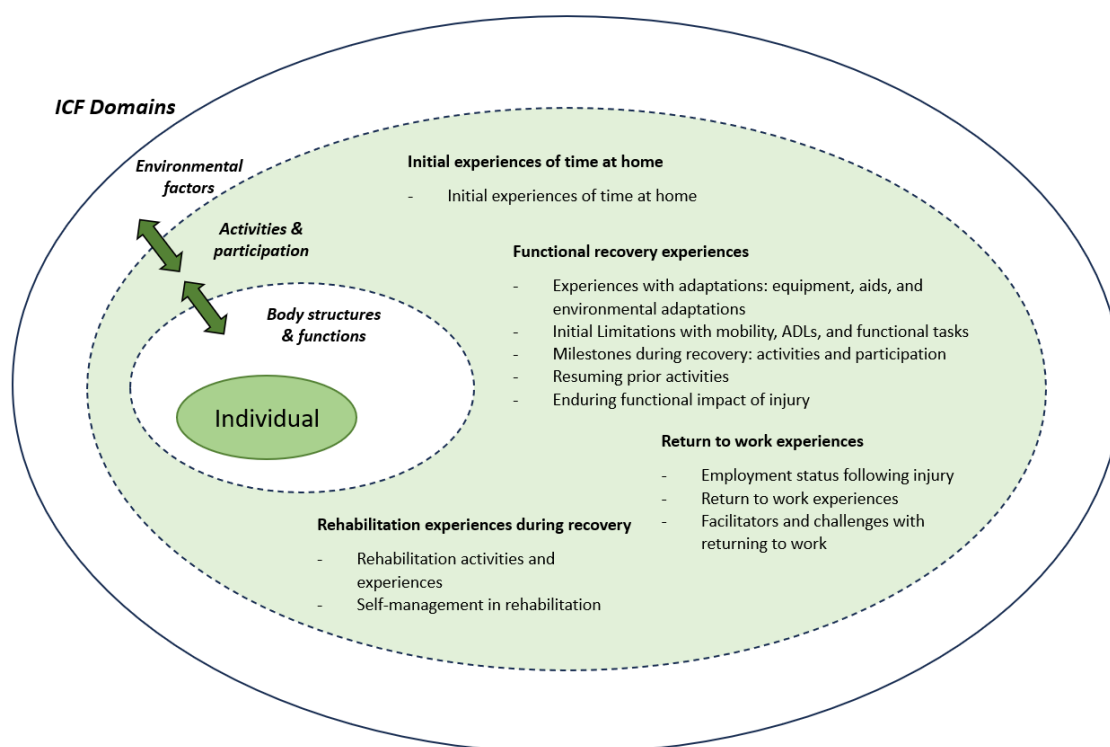
These findings indicate an overall lack of information on use of analgesia, especially surrounding the use of opioids. This has been identified in the literature, with participants reporting a lack of information about use of analgesia at hospital discharge (Goldsmith, McCloughen and Curtis 2018; Finstad et al. 2021). Finstad et al. (2021) explored the experiences of patients with severe trauma following discharge from a trauma centre found that all participants were discharged with opioid prescriptions, but not all participants reported receiving information on opioid use or weaning, leading to participants to try different weaning strategies on their own. Similarly, another study focused on pain management experiences of patients following traumatic injuries identified a lack of information about analgesia on discharge from hospital, with participants reporting reduced confidence in their ability to self-manage their pain (Goldsmith, McCloughen and Curtis 2018).

Pain management is important during early recovery and the International Association for the Study of Pain (IASP) recommends the use of opioids for severe short-lived pain, but recommends a cautious approach to prescribing of opioids for chronic pain, due to the risk of opioid abuse and deaths due to misuse and overdose (International Association for the Study of Pain 2018). Due to the prevalence of opioids prescribed in this population and the current 'opioid crisis', it is important that participants are educated on the benefits and risks of opioids as a pain management strategy and have guidance on how to wean off when ready.

An interesting observation from this study was that participants perspectives and knowledge on pain medications varied greatly, depending on prior knowledge or experiences with analgesia. This highlights the importance of considering patients' health literacy and clear communication when providing information to patients, so patients understand the medications they are taking and how to wean off them safely, especially since weaning off the medications occurs after leaving the acute care setting. One way to ensure that participants receive comprehensive information on medications could be to collaborate with pharmacy services to contact patients after discharge from hospital to provide information on weaning off opioid prescriptions and advice on accessing analgesia when away from their local area due to unforeseen reasons.

4.6.3 **Theme #2:** Recovery, rehabilitation, and participation experiences

Four classes consisting of eleven categories contributed to this theme. The findings are discussed in four sections, exploring each of the classes of the theme: initial experiences of time at home, functional recovery experiences, rehabilitation experiences during recovery, and return to work experiences. These classes are shown in Figure 20, along with the respective categories listed for each class. These classes were identified to relate to the “activity and participation” ICF domain, which were seen to interact with both the “body structures & functions” and “environmental factor” domains.



**Figure 20 - Theme #2: Classes (bold) and Categories for the Activities & Participation ICF Domain**

4.6.3.1 *Initial Experiences of Time at Home*

This class consisted of one category, focused on the initial experiences of the participants following discharge from the acute care setting.

At the start of the interviews, participants described their experiences of being discharged from hospital and the initial time at home. Perspectives of timing of discharge ranged from some thinking they left too early, some able to leave when they felt ready, and others keen to leave hospital as quickly as possible. For some, getting home was a positive experience, describing ‘instant relief’

when first arriving home. Participants described that they were keen to come home from the hospital and that it was seen as an important part of their recovery. Others felt that they had come out of hospital too soon, with one reporting they required full care from their partner for several weeks.

*“Participant: I thought I came home too soon, as did my [partner]. I think I'd have done better with having a few more days in hospital. ...*

*Interviewer: And why do you think it was too soon?*

*Participant: Because I just wasn't fit to look after myself when I got home, my [partner] had to look after me. As I said, I could get to the shower, but I was virtually confined to my bed for a few weeks.” (Male, 65+ years, major trauma, #15)*

Participants discussed their perspectives on their bodies and initial abilities. Some reported that their ‘body felt broken’ or ‘fragile’, and described a feeling of ‘helplessness’ due to their limited functional ability. Participants reported not being able to do much for themselves and that their functional ability would vary day to day.

*“... my body was so - it felt so broken when I came out of hospital.” (Female, 45 – 64 years, major trauma, #2)*

Some participants recalled the first days and weeks at home to be challenging to “*pretty horrible*” (Female, 45 – 64 years, moderate trauma, #1). Among the initial experiences, participants reported challenges such as poor pain management, discomfort from the early healing process, poor sleep, struggle of being less active, boredom, and challenges with managing stairs to their home.

*“Well, the first few days were very difficult because... - It wasn't that I went against doctor's advice... They had wanted me to stay longer, mainly because they couldn't give me the pain relief that I needed. And it was on a bank holiday, so I had some pain relief at home, [opioid analgesia]. But it wasn't sufficient because I'd been on [opioid analgesia] and [opioid analgesia] in hospital.” (Female, 65+ years, moderate trauma, #9)*

Other participants recalled the initial time at home to be less challenging, reporting they remembered early recovery to go well and they observed progress with mobility, gaining independence, and mildly boring, but overall manageable.

*“And I quite quickly - because the initial recovery seemed quite decent, quickly ditched having to use a zimmer frame and then I was going around on two crutches maybe for, maybe about 4 to 6 weeks. And then I was able to start moving around with just one crutch.” (Male, 45 – 64 years, major trauma, #19)*

Fatigue was mentioned, with participants describing feeling both physically and mentally tired initially and recalled that they tired quickly from activities. Participants mentioned being confined to the bed or the house for the initial time at home, mainly just resting and sleeping. Most initial activities took place at home and included resting, spending time with family, and sedentary activities such as reading, watching films, or crocheting. When able, participants also spoke about adding in physical activities in the form of walks and rehabilitation exercises. Having a daily routine in the initial time at home was considered important for some, including activities such as walks outside with family and dogs, aiming to complete some physical activity every day, and later on, going to the gym.

*“It was getting that, getting that routine, just to try and help your recovery as best you can.” (Male, 45 – 64 years, moderate trauma, #17)*

One participant described leaving the hospital earlier than they should have to care for their partner who was unwell. The participant stated that while they were unable to remember much from the first couple days at home, resuming the caring role for their partner helped them through the traumatic event.

*“I can't remember much about the first couple of days, quite frankly. Um, but I can remember, I didn't really feel - apart from soreness all over my body, I can't think of anything else. I think what helped us through the trauma was looking after my [partner]. I think it would have been sitting here without anything to do, perhaps I'd felt a lot worse. ... So I think that took my mind off myself and so perhaps my recovery was not usual mode of recovery.” (Male, 65+ years, moderate trauma, #7)*

The initial time after participants came home from hospital was a time when participants reported experiencing challenges, including feeling mentally and physically tired, feeling ‘broken’, and experiencing pain from the injuries and healing process. Participants in a study by Finstad et al. reported finding the initial time after leaving hospital more challenging than they had expected, due to pain and reduced functional ability (2021). Experiences of the initial time at home for adults with traumatic injuries has been captured in several studies, with similar challenges identified in this

study, such as pain management (Goldsmith, McCloughen and Curtis 2018; Finstad et al. 2021; Jackson et al. 2021; Baker et al. 2022), reduced functional ability (Baker et al. 2022), poor sleep (Jackson et al. 2021), and fatigue (Jackson et al. 2021; Baker et al. 2022). These findings indicate that the initial time at home poses challenges that relate to their physical impairments and functional limitations.

Current practice for the NoS MTN involves the trauma coordinators following up with patients' two to four weeks after leaving hospital (McKechnie, Burley and Gilhooly 2021). These findings suggest that this follow up may come at a useful time for participants, due to the initial challenges of managing at home with multiple injuries.

#### 4.6.3.2 Functional Recovery Experiences

This class consisted of five different categories relating to participants experiences with functional activities during recovery including initial limitations, adaptations, milestones in the recovery process, experiences resuming prior activities, and ongoing impacts from the injury.

**Category:** Initial Limitations with mobility, ADLs, and functional tasks

Initial functional limitations included mobility and functional tasks, such as ADLs. For some, mobility was limited initially, due to factors like pain, with some requiring walking aids for stability. Stairs were also reported to be a challenge.

*“So, I mean when I first came home, I was still, sort of quite immobile. I mean, I could walk, you know, short distances and I could just about get up and down stairs. But I was still very limited in movement and wasn't able to do much other than sit, sit around for probably quite some, quite some weeks.” (Female, 45 – 64 years, major trauma, #21)*

Participants reported limitations with other functional tasks, such as medical restrictions on lifting objects and driving, challenges with writing, housework tasks, and fine motor tasks. Completing ADLs independently was also reported as a challenge, including self-care tasks, meals, washing, manoeuvring in home environment (e.g. getting in/out of bath, in/out of bed, transporting food/drinks from kitchen), bending down, and reaching. These limitations required participants to seek assistance or manage independently with difficulty and tasks took longer to complete than usual.



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*“But it's sort of trying to work out like, how to wash your hair one-handed and how to get out of - like, our shower's in a bathtub - so trying to get out and someone else is help[ing] you. It's all quite awkward.” (Female, 18 – 44 years, moderate trauma, #3)*

In addition to initial limitations, participants reported that their functional ability varied day-to-day, sometimes experiencing unexpected setbacks.

*“I could do so much a day and then I basically used up my feet for that day during my recovery, you know. And there doesn't seem to be any kind of rhyme or reason to like the weeks that my feet felt better, you know. Sometimes, I could go to the gym and be fine for days on end without any problem. And you think, 'Oh, I'm kind of turning a corner here'. ... I would have days after that, where I could do very little on my feet. I would have to like, have a of a few days relaxing till I could get back up and exercise again you know.” (Male, 45 – 64 years, moderate trauma, #14)*

Initial functional limitations reported related to reduced ability to complete daily tasks and also impacted on participants' independence. Reduced functional ability was identified as a source of stress for some individuals following traumatic injuries due to loss of independence and inability to do their usual activities (Brand et al. 2018). An observation identified throughout data analysis was that participants spoke more about their initial functional limitations compared to the initial physical limitations in the initial time after leaving hospital. This is an example of how the ICF domains “body structures and functions” and “activities and participation” interact, and participants were observed to focus more on the limitations and restrictions experienced, rather than physical impairments. This confirms the importance of using PROMs to measure functional outcomes and abilities of individuals with traumatic injuries, such as the Glasgow Outcome Scale – Extended (GOS-E) and EQ-5D (Ardolino, Sleat and Willett 2012), as these can be used to track progress in recovery.

**Category:** Experiences with adaptations: equipment, aids, and environmental adaptations

Alongside the limitations, multiple participants required equipment and aids, as well as environmental adaptations. Some participants reported that they did not require any equipment on discharge from hospital. Others reported receiving equipment on discharge from hospital, including shower stools and bath seats, raised toilet seat frame, bed raiser-recliner, hand grabber tool, and arm slings. Multiple participants also received mobility aids and equipment such as zimmer frames,

crutches, orthopaedic boots, knee braces, and a trolley for inside use. Outwith the NHS provision, participants reported receiving equipment from other sources (e.g. insurers, self-funded) included a mobility scooter, recliner chair, and pet supplies, such as a raised dog bowl.

*“Well obviously, I was housebound for a start because I wasn't allowed out, but a friend managed to get a hold of a mobility scooter for me. So at least I could get out and about with my [partner] and the dog, even just around the block, just to get a bit of fresh air, ... Which was a great help.” (Male, 18 – 44 years, major trauma, #13)*

In addition to equipment, multiple participants reported that initially, there were modifications to their environment such as moving the participant's bed downstairs to minimise need to use stairs, temporarily moving to a single-level property, modifications to the house's shower room, and a ramp for entry into the property.

*“And when I came back home, it was quite difficult to get up the stairs and my bedroom's up the stairs. So my family had organised so that there was a bed downstairs and, so I only needed to get up the stairs once a day or twice a day.” (Male, 45 – 64 years, moderate trauma, #6)*

Another participant described stairs as a main challenge of living in their prior property following the injury, as there were entry stairs into the property and they had not practiced stairs before leaving the hospital. This individual reported they were travelling between a family member's single-level property and the regional hospital to attend follow up appointments regularly in the early recovery period.

*“And then I left [their property] to stay in a family member's home because it was all on one floor and stairs weren't my friend.” (Female, 18 – 44 years, moderate trauma, #3)*

Some participants reported experiencing no issues with the using mobility aids, others found them useful (e.g. zimmer frame with caddy for carrying items around the house), while others found mobilising with aids challenging.

*“They [physiotherapists] came with elbow crutches, which was the idea, to get me going on that from the zimmer frame. Which was great, except you can't carry anything when you've got crutches. (laughs) [The zimmer] in many ways, more handy.” (Female, 65+ years, moderate trauma, #5)*

Participants that came home from hospital with long-term casts, neck collars or orthopaedic boots, some described feeling 'desperate' to get them off and were happy when they were no longer needed.

*"I waited and waited and they told me that I would have it on for at least three months. That's what they said. ... Because the three months were up, you see, and I was desperate to get the thing off. (laughs) So I think I telephoned the hospital, probably more than once to see if I could take off. And they said, 'No, I couldn't take it off'. So I let it go on. Um, and I think it would have been [month] that the, the collar came off and I was so chuffed. I was really just delighted to have it off."*

*(Female, 65+ years, moderate trauma, #8)*

Participants reported using a range of aids to assist in the initial time at home, as well as changes to their home environment to be able to manage with their reduced functional ability. This is another example of interaction between ICF domains – participants' experiences (i.e. activity limitations) were an interaction between their physical impairments in the context of their home environment. These activity limitations required adaptations to enable functional ability within the participants' environment.

Participants in this study reported that they were provided with all equipment they required in a timely manner following discharge. This suggests that that the coordination and provision of required equipment is currently managed well and is a positive factor for the transition home from hospital.

**Category:** Milestones during recovery: activities and participation

Throughout recovery, participants mentioned milestones as notable stages or events in their functional recovery.

Improvement in mobility was a common milestone, with participants reporting they were gradually able to walk farther and faster and able to progress what mobility aid they were using (e.g. switching from a zimmer frame to crutches). Some participants reported taking daily walks, but some still experienced pain that limited their ability.

*"But I would say, probably by middle of [month], so probably about a month after that [leaving hospital], I was becoming much more mobile - still in a lot of pain."*

*(Female, 45 – 64 years, major trauma, #21)*

Another milestone was being able to manage the stairs and feeling confident using them. For some, being able to manage the stairs meant that they were able to move their bed back upstairs.

*“And that is, you know, moving from a bed downstairs, feeling like a patient, to being able to get up to bed upstairs, use a shower upstairs, come downstairs as a more normal human being. That's quite a big milestone really” (Male, 65+ years, moderate trauma, #11)*

Another milestone was resuming ADLs independently. One participant described that they were able to complete their ADLs independently after two weeks, with the household tasks taking longer, resuming about a month after coming home. Another participant spoke about resuming personal care tasks and eating independently as their first milestones in their recovery. In the following months, this individual reported their physical recovery improved their confidence and independence.

*“I started to become more confident in myself. I became more stronger. And I was able to have a bit more freedom because I was able to do a lot more for myself than I could in the initial days and early weeks of the accident. I could get myself out and about.” (Male, 65+ years, major trauma, #15)*

The return to driving was considered a required milestone for some that improved participation, enabling them to return to work, attend follow up appointments independently, and participate in social activities, like exercise classes. Some reported no issues with returning to driving and one described that they resumed driving as soon as they were physically able to.

*“Participant: I've just started driving again about three weeks ago. So before that, my [partner] had to, [they] had to take me when [they] were off. Um, but also, sometimes I would take the bus. But buses aren't very - there's never one when you're needing one. (laughs) ... Now I can drive now. So I go to this exercise classes myself.*

*Interviewer: ... And how has that been to be back [driving]?*

*Participant: It's good being independent.” (Female, 45 – 64 years, major trauma, #10)*

Similar to the physical milestones, the functional milestones were seen as ways that participants observed progress throughout their recovery. Improving functional ability was also helpful in improving participants' independence and meaning that they required less support from family and

friends (discussed in Section 4.6.4.1) and were able to resume their previous activities. The types of functional milestones mentioned by participants in the interviews (i.e. mobility, independent ADLs, usual activities) aligned with the HRQoL domains measured by the EQ-5D (see Section 4.5.1). This confirms that the EQ-5D is an appropriate outcome measure to use in in traumatic injury population as it measures patients' abilities with functional tasks that are relevant to their HRQoL (Ardolino, Sleat and Willett 2012; Devlin, Parkin and Janssen 2020b).

**Category:** Resuming prior activities

Throughout the recovery journey, participants spoke of their experiences of returning to doing their usual activities.

Some participants reported a full return to their usual activities at the time of the interview. Participants often did not recall exactly when they returned to activities, but some mentioned that it was around 6-8 months after leaving the hospital that they resumed their 'normal activities'. These activities included physical activities such as walking, climbing, going to the gym, exercise classes, snowboarding, walking dogs, swimming, cycling, kayaking, horse riding, managing a garden allotment, and caring for horses. Other activities included sedentary activities (i.e. computer activities/PlayStation, writing and crafting, knitting, sewing, crocheting, reading, paperwork) and activities around the house (i.e. baking, household tasks, gardening, chopping wood), as well as driving. Some activities were done with the participant's partner (i.e. going out to theatre, eating out, weekly walks, outdoor activities).

*"I've been quite fortunate. I've been able to do most things since I got home."*

*(Male, 65+ years, major trauma, #12)*

Some described a gradual return to their activities, especially activities that were physically demanding (i.e. horse riding, walking multiple dogs, cycling). Participants reported that they were able to judge themselves when they were able to return to their activities and that it took time to *"get more comfortable with moving again"* (Female, 18 – 44 years, moderate trauma, #3). One participant described their experience with resuming cycling, needing to adjust their expectations for how long it would take to recover.

*"I did go out cycling, I think, towards the end of [year]... So I borrowed a friend's bike and it was actually too soon because I couldn't change the gears. My thumb really wasn't strong enough to do that. So that was a sharp learning curve that, because I thought, 'Actually this is going to take quite a long time for my thumb to*

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*be able to work properly again and to have that strength'." (Female, 45 – 64 years, major trauma, #2)*

Some reported modifying their activities, such as attending a beginner's exercise class instead of advanced classes, purchasing an e-bike to replace a pedal-bike, playing a couple holes of golf instead of a full game, reducing the number of horses they owned, limiting the amount they are out in the garden, and cycling with people instead of alone. These modifications were described in a matter-of-fact way in the interviews, as they allowed the participants to keep engaging in the activities they enjoyed. Some participants also mentioned they were practicing pacing when doing activities.

*"Well, I used to play every weekend. ... We had a competition every week - aye, but since my injury, I don't feel I can play X amount of holes and so I don't. I just go over, play a couple of holes myself. I've been out once with one of the regulars - played 13 holes and I was - I felt it. So, no, I just go over and play a couple of holes. I feel good when I can do that." (Male, 65+ years, major trauma, #12)*

Some participants spoke about how their routine and habits changed following the injury. Some participants reported that they were able to fill their time with activities that they enjoyed. This included participating in new activities, such as exercise classes, swimming, yoga, stand-up paddle boarding, and volunteering at an allotment. Some participated in activities for the social aspect, including exercise classes, social walking groups, social sport leagues, and other social activities.

*"I have met some new people because I started going [to exercise classes] and it was for the company and to get out of the house because, um, there was - I wasn't stuck in a house, but once [partner] was back at work and [adult child] was back home, I was here myself. So I thought, 'Well, I'll have to start getting out and meeting people again'. So that's why I decided to go to these so. And it does help." (Female, 45 – 64 years, major trauma, #10)*

One participant reported that they did not experience any changes in their usual routine as both they and their partner were retired, so the injury was not seen as much of an inconvenience.

*"It was so such a non-event in a way, that it really - And because we'd retired, it didn't inconvenience me." (Female, 65+ years, moderate trauma, #5)*

Some had not resumed their prior activities. For some, this decision was based on personal reasons such as the required time commitment of the activity. For others, it was a pragmatic decision related

to their physical condition following the injury, such as not playing football after a knee injury or going hillwalking because of an upper body injury that restricted their ability to wear a rucksack.

*"I've never been back to football, but again, I wouldnae - I just wouldn't manage because there's obviously a lot of twisting and moving and stopping and starting and my knee - I ken my knee wouldn't take it." (Male, 18 – 44 years, major trauma, #13)*

At the time of the interview, some participants described still experiencing challenges with participating in their usual activities or not being back to the same level as before the injury. This was due to factors such as ongoing physical limitations from the injury, pain and fatigue, subsequent injuries, and seasonal timing for outdoor activities.

*"I've played badminton a few times, but again, I've certain shots that I used to go for that I've nae got the same like, like spring, that same like movement that - So that's kinda, that has affected things." (Male, 18 – 44 years, major trauma, #13)*

Another challenge some participants mentioned was resuming the activity they were doing at the time of the injury. This was mentioned by those who were injured while driving, cycling, horse riding, a fall from a height, and pedestrian vs car.

Driving again following the injury after an RTA was challenging for some. This included perspectives of those who reported they could physically drive, but were 'disinclined to drive' to those who reported more challenging psychological challenges (i.e. fear, anxiety) and the emotional experience of driving past the site of the injury. One participant reported that they weren't expecting these challenges and did not realise it would be a challenge until they attempted to drive again. Another participant reported they experienced reduced confidence when driving following the injury.

*"So I did start to get quite agitated about driving, I must admit. And even now, I have to be honest and say that I don't drive outwith my comfort zone." (Female, 65+ years, moderate trauma, #9)*

A participant who sustained their injury while cycling reported that they were surprised at the amount of confidence they had lost following the accident and that they were currently cycling with others and going on short cycles by themselves to build up their confidence. Others reported challenges resuming horse riding, describing residual fears, nerves and anxiety, and 'thinking twice' about riding the same horse as at the time of the injury. Another participant that sustained their injury in a fall reported that they have since avoided going on ladders, describing it as, "it's not fear,

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*it's just what I would call wisdom, you know, it's not done me any good, so I avoid it."* (Male, 65+ years, moderate trauma, #11).

Resuming activities was viewed as progress in recovery for participants, especially with the ability to participate in physical activities. The return to meaningful activities is known to be an important to recovery (Kampman et al. 2015; Norris et al. 2023). The systematic review by Norris et al. identified that individuals' "recovery state was largely described through the participation (or not) in an activity that was meaningful to the person" (Norris et al. 2023 p. 7), emphasising the vital role resuming activities has on the recovery process. A meta-ethnography on post-traumatic growth following severe physical injuries identified individuals had an increased appreciation for 'meaningful leisure activities' as a source of independence and provided both extrinsic and intrinsic rewards following the injury (Kampman et al. 2015). This finding indicates the use of patient-set rehabilitation goals are a particularly valuable strategy for HCPs to use throughout recovery.

In this study, participants mentioned that improvements in basic functional tasks such as mobility and ADLs was then progressed to returning to their usual activities such as driving, return to work, and previous activities. At the time of the interview, a number of participants reported they had resumed their usual activities and had returned to their previous employment. This level of recovery corresponds with the EQ-5D Health Profile values (see Table 29) observed across participants, with only two participants reporting moderate to extreme problems with completing their usual activities.

The return to previous activities was another topic where multiple ICF domains were observed to interact, with the participants' experiences of returning to their usual activities associated with their physical impairments (and sometimes psychological challenges) and their environment.

Some participants reported challenges with resuming the activity that caused the injury, with the most common being driving following an RTA. Initial restrictions with driving were due to physical impairment, but some experienced psychological challenges too. This study identified a range of experiences, where some participants that had been injured in an RTA did not report any issues with resuming driving, others had mild reservations, and for some it was an ongoing challenge. The psychological consequences of experiencing a RTA has been well-documented, with consequences such as acute stress syndrome, PTSD, and phobic travel anxiety (Mayou, Bryant and Duthie 1993; Hobbs et al. 1996; Üzümcüoğlu et al. 2016). Participants in this study reported that having long-term access to psychological services was helpful as they did not know how they would react to returning to certain activities during their initial recovery.



**Category:** Enduring functional impact of injury

Some participants reported experiencing no ongoing limitations and that they were managing all their daily tasks and had no issues with mobility.

*“And now I would say I'm as fit, and everything's recovered as well as it's going to recover now, you know. So that's me able to do, pretty much more or less what I did prior to the accident.” (Female, 45 – 64 years, major trauma, #2)*

While some were back to their usual activities, there were participants that reported that they still had enduring functional issues at the time of the interview. For some, mobilising was still a challenge and described that they cannot walk as far or as fast as they used to and that their walking endurance was reduced. Some reported still using walking aids and one participant used a foot-ankle brace to counter foot drop caused by the injury.

*“So I use a brace to help me to hold my - to counter the foot drop. I use a foot-ankle brace type of thing. And walking is slow because the sensory feedback that comes up from my foot is missing.” (Male, 45 – 64 years, moderate trauma, #6)*

*“I'm getting around with one crutch just now fine. But it's kind of slow and labored, and as I say, getting up and down is painful and anything more than kind of 10 or 20 steps, then it starts to feel kind of quite painful again as well, you know.” (Male, 45 – 64 years, major trauma, #19)*

Some participants reported ongoing challenges with tasks around the house, such as gardening, stairs, bending down. One participant reported they were only managing light household tasks and ADLs with equipment and modifications, requiring them to pay for the services they were unable to do (i.e. dog walking, gardening, cleaning).

*“... a lot of stuff I can't do just now. I have to pay for a dog walker. I'm having to pay for a gardener and I've had to pay for maids ... Maids come in once a week to tidy up the house and that kind of stuff...” (Male, 45 – 64 years, major trauma, #19)*

Other participants mentioned experiencing limitations to what they were able to do because of the injury. This ranged from limitations such as lacking ‘brute grip strength’ for tasks like opening jars and holding the arm position for drying their hair, to others reporting that they are currently unable to do many of their usual tasks because of the injury. Several participants described having reduced fitness levels from the injury and due to the length of recovery and because they were limited in the options

they had to get cardiovascular exercise. One participant reported that their sleep was still affected due to the injury and that they are unable to carry a rucksack due to upper limb injury.

*"I haven't been hill walking since because I can't even put the rucksack - I can't even put a rucksack on my shoulder. I can't put a tote bag on my shoulder. I can't put a handbag on that shoulder. And so there's no way I can go up a mountain carrying a rucksack of water and waterproofs and lunch and stuff like that - just wouldn't make it. So that is disappointing, but I can cope with that." (Female, 45 – 64 years, moderate trauma, #1)*

Alongside the impacts from the injury, some participants reported they were experiencing functional limitations due to causes not related to the injury, such as avoiding high impact injuries due to previous injuries, reduced balance that was present before the injury, and challenges with lower body dressing.

*"I've got a hip full of metal. (laughs) And we've got all these injuries to joints. There are certain things that are not wise to do, so nothing high impact. So I don't run. I could run, but it wouldn't do me any good, so I just avoid it by brisk walk or anything like that." (Male, 65+ years, moderate trauma, #11)*

These findings relate to the EQ-5D data, where at the time of the interview, around half the participants reported experiencing slight to severe problems with mobility (47.4%) and usual activities (63.2%), with only a few reporting slight to moderate problems with self-care activities (18.8%). As the interviews took place between 14 – 25 months post-injury, this indicates that some participants' were still experiencing ongoing long-term issues (e.g. over a year post-injury), which were described in the interviews to be mainly related to mobility and functional tasks.

These findings indicate that there may be a need to measure patient outcomes past one year post-injury, as STAG is currently only recording PROMs at six month and one year post-injury (Dodds and Khan 2020). A previous study found that patients with serious injuries report ongoing problems related to the five EQ-5D health state domains at three years post-injury (Gabbe et al. 2017). Collecting data on long-term outcomes is beneficial because it can be used to assess how acute and community rehabilitation interventions impact on patients' outcomes. It would also be beneficial to consider the creation of a trauma registry for research purposes, similar to the VSTR in Australia, as these registries enable long-term, longitudinal research into patients' long-term outcomes and experiences (see Section 2.9.2).

#### 4.6.3.3 Rehabilitation Experiences During Recovery

This class consisted of two different categories relating to participants' experiences with rehabilitation and self-management of their rehabilitation.

**Category:** Rehabilitation activities and experiences

Rehabilitation was mentioned in relation to physical recovery and participants' perspectives of rehabilitation were varied. Some participants reported that their initial rehabilitation went well, others reported experiencing challenges such as mental health challenges after leaving the hospital that impacted on their rehabilitation or needing further surgeries and frustrated by rehabilitation 'going backwards'.

*"I tried doing them [exercises], but like after I got out of hospital, I went into a bout of depression, my head was just all over the place." (Male, 18 – 44 years, major trauma, #16)*

Early rehabilitation interventions were considered to be important for some, both for those that received it and those that did not. One participant started private pilates sessions several weeks after leaving hospital and reported the early intervention was beneficial to their recovery. Another participant did not have access to physiotherapy initially and believed they would have benefitted from it.

*"I think I certainly could have done with more... Um, Perhaps some more physio in that first initial sort of periods, and it took a little bit of time, I guess, after different e-consult messages and everything else, to actually get some physio organized for myself." (Male, 65+ years, major trauma, #15)*

Participants spoke about the different types of rehabilitation activities that they performed. Some reported getting sent home with physiotherapy exercise from the hospital. This included breathing exercises for those with rib fractures, as well as progressing mobility, assistance with transfers and movements at home, and daily exercises. One participant found it beneficial to get exercise outside, another spoke about the importance that their previous fitness had on their recovery from the injury. Participants used both NHS and private rehabilitation services, with the professions and purposes of use in Table 30 and Table 31 in Section 4.6.4.3. Some participants expressed that accessing private rehabilitation services significantly impacted on their recovery.

*“So had I not had the private physio, I feel that my recovery would have been worse off for it and I would have ended up consuming more resource from the NHS, from that perspective.” (Male, 45 – 64 years, moderate trauma, #6)*

At the time of the interview, some participants reported they were still engaged in rehabilitation activities, such as going to the gym, using private rehabilitation services, progressing exercises using weights and theraband resistance, increasing endurance for mobilising, and attending exercise classes. Others were not receiving any rehabilitation input at the time of the interview. Some mentioned they were receiving ongoing medical input for issues related to the injury or subsequent injuries.

*“No, it [rehabilitation] didn't phase out because, getting the range of movement in the leg, getting the breathing. Okay. Now what are you going to do with it? Well, obviously, you want to drive, you want to go walking, running, whatever. ... yeah, so a lot of strength exercise. So I would use weights, I would use a suspension system, which we've got for doing, you know, you could do press ups at an angle and then get to a full press up, eventually. I've used the therabands for leg strengthening ... basically get a full range of exercise for all the muscles that have wasted.” (Male, 65+ years, moderate trauma, #11)*

At the time of the interview, there were varied views of whether participants considered themselves to still be 'recovering'. One participant reported that their recovery was ongoing, with input from private physiotherapy over one year post-injury:

*“... it's been great to manage that [rehabilitation] process all the way through, you know, so I still keep it up. And I'm still recovering. So I intend to stop it when everybody agrees that my recovery has plateaued, but I'm still improving - I'm still less strong, less flexible and less fast than I was before the accident.” (Male, 45 – 64 years, moderate trauma, #6)*

Other participants spoke of their recovery journey finishing when they were able to return to work and able to manage most of their usual tasks.

*“I mean like overall it took me seven and a half months. It was like, I think it was [month] before I got back to work. And I think it was like the end of February, which wasn't really bad going. It was like seven and a half months after the accident, you know. So I felt it was all right” (Male, 45 – 64 years, moderate trauma, #14)*

**Category:** Self-management in rehabilitation

Rehabilitation was reported to be self-driven. Rehabilitation activities such as going for walks, using exercise equipment (i.e. stationary bike), going to the gym, swimming, and practicing mounting/dismounting a saddle were completed independently.

*“Like quite a lot of it, I done myself, you know, like being aware of what I need to do to progress things quicker, you know? Um, so no, it's - I kinda rely on quite a lot of it myself, you know.” (Male, 45 – 64 years, moderate trauma, #14)*

Several participants reported using their previous knowledge or researched rehabilitation information to help with their recovery. Some participants reported that they had minimal rehabilitation support initially, but were able to manage independently. One participant had previous knowledge from being a fitness instructor and spoke about how they were able to set up their own rehabilitation plan and carry it out themselves.

*“Well, at the time, it was Covid restrictions so there was no physiotherapy available to me. So I took it upon myself - I've always enjoyed my fitness and keeping fit since I was, you know, 16, 17 years old. So I knew exactly what I had to do. And there's a small area in the house that we use as a wee fitness room, so I just made up a wee programme for myself, um, and basically worked on my fitness and recovery as soon as I was able. ... So, before I would go ahead and, uh, give myself a new set of exercises or increased weights, I would speak to a medic or speak to one of the nurses that was on the ward. Or one of the physios...”  
(Male, 45 – 64 years, moderate trauma, #17)*

Participants described engaging in rehabilitation to regain functional ability. This involved the participants engaging in formal rehabilitation services or managing on their own with minimal input from HCPs. Participants described most of their rehabilitation activities as something they completed independently, some having assistance from rehabilitation HCPs, such as physiotherapists, occupational therapists, psychologists, and private services such as neuro linguistic programming therapist and exercise instructors. As the timing of this study coincided with the end of the Covid 19 pandemic, services were affected during the beginning of the year in 2021, with community rehabilitation services remobilising during the summer of 2021 (see APPENDIX Y). These changes to the services could have impacted on the participants' rehabilitation experiences, as participants discharged prior to the summer may not have been able to access community rehabilitation services initially.

In this study, some participants reported having adequate information and confidence in their ability to independently self-manage their rehabilitation. Others reported experiencing challenges, mainly relating to lack of information (discussed in Section 4.6.4.4). A common perspective was that rehabilitation self-driven by the participant, but participants valued input and guidance from HCPs, similar to the findings of other studies (Kimmel et al. 2016; Claydon, Robinson and Aldridge 2017; Ekegren et al. 2020; Visser et al. 2021). This indicates that participants were engaging in self-management of their condition.

Healthcare professionals can facilitate supported self-management, a form of personalised care that is commonly used with individuals with long-term conditions health (Dineen-Griffin et al. 2019). Supported self-management is where HCPs provide information and resources to “increase[e] the knowledge, skills and confidence a person has in managing their own health and care” (NHS England 2023 para. 1). Healthcare professionals can provide support for self-management by forming a collaborative relationship with patients and providing techniques and tools to manage their health (Dineen-Griffin et al. 2019). Previous literature has explored the use and feasibility of supported self-management in neurological injury populations (Munce et al. 2014, 2016; Mäkelä et al. 2019), but future qualitative research into what patients with non-neurological traumatic injuries perceive to be important aspects of supported self-management would be beneficial.

Another area of future research identified from this study was evaluating the accessibility of rehabilitation services in the North of Scotland, as there were varied experiences with some participants accessing multiple rehabilitation services and some not accessing any. This could include an evaluation of the effectiveness of rehabilitation interventions for adults with traumatic injuries that measures rehabilitation parameters and the impact on patient outcomes, as there is a lack of high quality studies on multidisciplinary rehabilitation in the traumatic injury population, due to practical challenges (Khan, Amatya and Hoffman 2012; Al Hanna et al. 2020). These areas of research are in addition to other rehabilitation-related research questions that have been previously identified as priorities for major trauma, such as the impact of early rehabilitation on patient outcomes, prevalence of disability in the years post-injury, and identifying what outcome measures to should be used to measure quality of life or the effectiveness of rehabilitation (McElroy et al. 2022).

#### 4.6.3.4 Return to Work Experiences

This class consisted of three categories, in which participants spoke about their experiences when returning to work, the facilitators and challenges they faced, and their current employment status at the time of the interview.

**Category:** Return to work experiences

Several participants reported working through their early recovery. One participant that was in a higher education programme reported continuing to attend virtual classes once they had left the hospital and received extensions on coursework. Another participant that was self-employed continued to run the administrative side of their business throughout recovery and reflected on it as a positive experience as it kept them busy. Another participant that worked in a small team continued to work virtually to support the team with important deadlines.

*“I started joining into the calls ... So that's obviously a very busy time [for the company], so I had a lot of knowledge about what was needing to be done, but couldn't physically do it. But at least the other team members had support. For me being able to say, 'Oh, that's what happens there, or that's what happens there'. ... I was able to feel I was contributing, which probably helped a lot as well.” (Female, 45 – 64 years, moderate trauma, #1)*

Participants reported using a phased return approach, which involved reducing the amount of time worked initially, working from home, or completing less physically challenging tasks. While this was seen as useful for participants, some participants found it challenging to have the gradual phased return to work, some reported *“getting fed up, just not doing anything” (Female, 45 – 64 years, major trauma, #2)* and it gave them something to do. For another, it was challenging because they worked in a small team and found it was challenging to set boundaries on what they were able to do while maintaining the phased return.

*“It is very difficult when no one's been doing your job to suddenly just do a few hours a day and, you know, sort of - and [that's you] back to work because people then know you're back and then, do you - what bits do you do and what do you don't do? So, yeah, I found that quite difficult, sort of to - you talk about phased returns. But in practice, everybody suddenly wants you again, you know?”  
(Female, 45 – 64 years, major trauma, #21)*

Some reported there being modifications to their work tasks, such as avoiding tasks that were similar to the mechanism of their injury (i.e. climbing on ladders, stairs). For these participants, they reported following the modifications initially, but then deciding what tasks they were comfortable completing later on. Others recognised that they may need the modifications longer term with physical tasks that were a part of their role.

*“I've decided that I could go back on it [social care role], on a relief basis. ... But it will be on my terms. Because I know I'm not in the stable enough, physically stable enough to be able - [name of client], ... [they] can quite volatile and push and shove without a lot of reason. So I'm not going to put myself in that position and I've said that would only work on a 2 to 1 basis because lone working is - I just don't think I could go back and do any more.” (Female, 65+ years, moderate trauma, #9)*

As the participants' job roles varied greatly, there were many different experiences and aspects of returning to work. Some participants were able to start their phased return to work by working from home. This was impacted by the Covid 19 lockdowns, as some of the participants' teams were still working from home due to the Covid 19 lockdowns. Others needed regain their physical fitness and be able to drive before they were able to return to work.

*“So I went back to work full time around [month]. Well, we had still been working from home because of COVID. So I could go on to a Teams call, although I couldn't type or do anything initially or use a computer but could get on and chat.” (Female, 45 – 64 years, moderate trauma, #1)*

Several participants reported completing work assessments for insurers, needing medicals, or receiving fit notes for employers.

*“... things are being done through insurances and I have got to kind of go with what they say [for increasing hours]. And because it was them [insurers] that did this return to work thing yesterday, assessment. So um, everything's being done through solicitors at the moment, so it's a bit complicated.” (Female, 45 – 64 years, major trauma, #10)*

On reflection, one participant reported that they would have changed some aspects, including delaying their return to work, built up hours slower, had clearly defined boundaries for the phased return, and possibly accessed the organisation's occupational health service.



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*“I probably should have more clearly defined what I could do, you know, in that in that period of time.” (Female, 45 – 64 years, major trauma, #21)*

In this study, participants had a range of return to work experiences, with some working throughout recovery, others using phased returns, and modifying tasks in the job role. Participants that worked through the early recovery period reported it to be a positive experience, as it gave them a way to keep busy. None of the participants reported using the local vocational rehabilitation service associated with the trauma service, but this could have been due to changes in service availability due to Covid 19 pandemic (see APPENDIX Y).

Some participants discussed their motivation for wanting to return to work related to wanting to keep busy and for financial reasons (see Section 4.6.4.1). Other studies have identified priorities for return to work for individuals with traumatic injuries related to participants’ sense of purpose and identity, social interactions, and financial stability (Gavin et al. 2022). The second synthesised finding in the systematic review (Chapter 2) identified participants’ motivations to return to work included financial benefits, feeling useful and a sense of achievement, and enjoyment of work (Section 2.7.5.2). As the majority of the participants in this study were working at the time of their injury, HCPs should consider the psychological and financial impact that patients may experience when not working during recovery and also during the process of returning to work.

**Category:** Employment status following injury

At the time of the interview, multiple participants reported that they had fully returned to their prior work or full-time higher education programme. Previous work included full time employment, part-time employment, and self-employment. Not all participants could recall the timing of when they returned to work, but of those that knew, it ranged from two months to a year and a half following the injury. Several participants had returned to their previous work with modifications, such as reduced working hours or modified tasks.

*“There were lots of challenges. Physical challenges, in terms of fatigue and tiredness, which I still - the number of hours that I go to work are, even today, only between 4 and 6 hours. And I was doing 12 to 14 hours before. It might not be a bad thing in my view, you know.” (Male, 45 – 64 years, moderate trauma, #6)*

Several participants reported they had a change to their occupational status following the injury.

One participant spoke about how they decided to go into full retirement following the injury as they were not able to manage the physical aspect of their previous job. They reported that they had enjoyed their job and would have liked to work for a couple more years, but that they were content to be retired. The participant spoke of the adjustments this change brought up for them and their partner.

*“So the transition was okay. Um, obviously it's an adjustment that you have to make. You've got to realise that you're the one who's now home full time and this is your [partner's] domain, and you really have got to sort of just, um, make your own routine, but not try and disturb [their] routine that much.” (Male, 65+ years, major trauma, #15)*

Another participant was dismissed from their role following the injury, which they found challenging.

*“I had a lot of anger in me. ... It wasn't so much - It was just the whole thing. And I had to give up my work because of the back pain. So, they retired me early, but in fact, the letter that they sent out was almost like a dismissal letter. ... And caused me a lot of angst. It did, but I didn't like being dismissed, as it said. But I'm now over that because I'm just applying to go back to work.” (Female, 65+ years, moderate trauma, #9)*

Another participant was self-employed prior to the injury and had their own company. During their recovery, they found that their company was continuing to succeed throughout their recovery, so when their physical condition allowed, they started a second business.

*“So I started up a new business. It's a very ambitious project, and I wanted a mental project to match my... Match the size of my physical recovery project. It's a very massive mountain. I was never inclined towards physical activity, you know. So the irony of it is that I have a lot of it every day now (laughs), but I needed a mental challenge to equal it.” (Male, 45 – 64 years, moderate trauma, #6)*

For the participants that were working at the time of the injury, most reported that they had returned to their previous work at the time of the interview. There was a range of participant experiences described in the interviews, as some participants were retired or not working, some were back to their previous work, others were in the process of returning to work or had a change to their employment status following the injury.

The percentage of patients that have a successful return to work at one year post-injury varies in the literature from over a third (36%) to two-thirds (67.0%) of patients with traumatic injuries (Kendrick et al. 2017; David et al. 2022). A study evaluating outcomes of patients with major trauma from a UK MTC found that 66% of patients had a full return to work and 15% reported an incomplete return to work (Spreadborough et al. 2018). When comparing the patients that reported a full return and incomplete return, Spreadborough et al. identified that those with incomplete returns reported higher levels of psychological challenges (e.g. PTSD, anxiety, depression), physical disabilities, and pain than those that reported full returns (Spreadborough et al. 2018). As patients with traumatic injuries are at risk of long-term physical and psychological consequences from the injury, this indicates the importance of having access to vocational rehabilitation services as well as psychological services to assist with the return to work process.

**Category:** Facilitators and challenges with returning to work

There were multiple facilitators mentioned that aided the return to work including flexible return timelines and initial tasks, supportive colleagues, and contact with employer and colleagues during recovery.

Participants reported that they did not feel any pressure from their employer to return to work, some reporting that they were able to dictate the timing of their return. This was done by keeping in contact with their employer and colleagues throughout recovery.

*“... my line manager was actually in touch with me from the minute I came out of hospital. And [they] did say, 'If at any point, you don't want me to contact you, that's fine, because I won't'. But actually we agreed to stay in touch on a weekly basis, which was nice, you know, because [they] were just seeing how I was getting on and everything.” (Female, 45 – 64 years, major trauma, #2)*

When participants returned to work, some participants' roles were more flexible than others. One participant reported that they were able to plan their schedule around how they were feeling on the day and *“tailor the job to suit the way I'm feeling” (Male, 45 – 64 years, moderate trauma, #14)*. Participants reported received support from their employer and colleagues, which mostly consisted of nice messages, cards, and moral support.

*“I mean, there was no pressure for me to go back to work when I did. They were sort of more pushing me to take it slower, you know. And yeah, no, they've been fantastic and still are, you know, any appointments or that I've had, it's never*

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*been a problem. So no, they've all been great. Yeah. I've got a good bunch of work colleagues.” (Female, 18 – 44 years, major trauma, #18)*

Participants also mentioned challenges with returning to work including fatigue, physical challenges, employer factors, and finding their place in work.

Some participants reported experiencing fatigue when returning to work. The level of fatigue experienced was unexpected and took a long time to ‘get over’, with one participant reporting that they needed to use holiday time off to recover.

*“But then when I did go back full time, I hadn't realized how tired I'd be. I was just absolutely exhausted. The first full week that I did, I think I slept for the whole weekend. So yeah, that was something that I wasn't expecting to happen. I was very, very tired and that took quite a long time to get over.” (Female, 45 – 64 years, major trauma, #2)*

Another challenge was the physical impact of the injuries on participants’ abilities to complete their work. For participants with desk jobs, sitting for long periods was reported to be challenging due to stiffness in the injured areas and oedema in the lower limbs, as well as fatigue. Participants with upper limb injuries reported that their ability to type on a keyboard was severely impacted, but were able to communicate with their colleagues via phone or video calls instead.

*“I probably went back too quick, so I got tired quite quickly. And, you know, when you're sitting around the house, sort of not doing anything - and I'm not very good at that. You kind of think, 'Well, I might as well be sitting at a desk working, so what difference does it make?' And, yeah, I don't think I realise how much that would sort of take it out of me, just sitting and getting stiff, you know, - because I did used to get very stiff at the keyboard” (Female, 45 – 64 years, major trauma, #21)*

Other external challenges some participants experienced related to the employer. One participant’s employer had hired new staff in their absence, so they were only offered reduced hours on returning to work. Another participant worked in offshore role and on their first trip back out following the injury, they spoke about how there were concerns from the safety officers about their physical ability and safety on the rig. The participant thought this may have been due to the fact that it was an unfamiliar rig and crew.

*“It was noted that I was shuffling about the place. There's one of the safety officers that said to my supervisor, 'What's the story with your guy there? I don't think that's safe, [them] wandering about the plant like that', because I was basically shuffling about, you know. I had to explain what the injuries were. And like I said, 'Well, look, I've been cleared by the doctor.’” (Male, 45 – 64 years, moderate trauma, #14)*

One participant mentioned that it was challenging to find their place at work again after having time off for the recovery, as the company had continued to succeed without their input.

*“Finding my place in work was also tricky, you know, because I was out of the loop. Even after I got discharged from the hospital, while I was in touch with my [colleagues], I didn't feel ready to really start working, as it were, until maybe [month]... But by this point, they've managed without you for so long that you now need to find something to do, you know. So it's not a (laughs)- it's not just as simple as going back to work.” (Male, 45 – 64 years, moderate trauma, #6)*

These findings highlight the facilitators and challenges participants experienced when returning to work. Facilitators included supportive employers and colleagues and having flexibility in the return timeline and initial tasks. Support from colleagues and social connections was identified to be facilitators in the second synthesised finding in the systematic review (Section 2.7.5.2) and other literature (Bridger et al. 2021). Another possible facilitator of returning to work was due to the timing of the study, many workplaces were just in the process of switching back to normal, in-person processes at the end of the Covid 19 lockdowns, but some mentioned that their job roles were still set up to work remotely and this was how they started a phased return. Research on remote working following the Covid 19 pandemic identified that for individuals with disabilities, remote working enabled them increased autonomy over how and when they worked was beneficial as individuals reported it allowed them to better manage their health (Taylor et al. 2022). Remote working should be signposted and discussed with employers, where possible, to facilitate return to work.

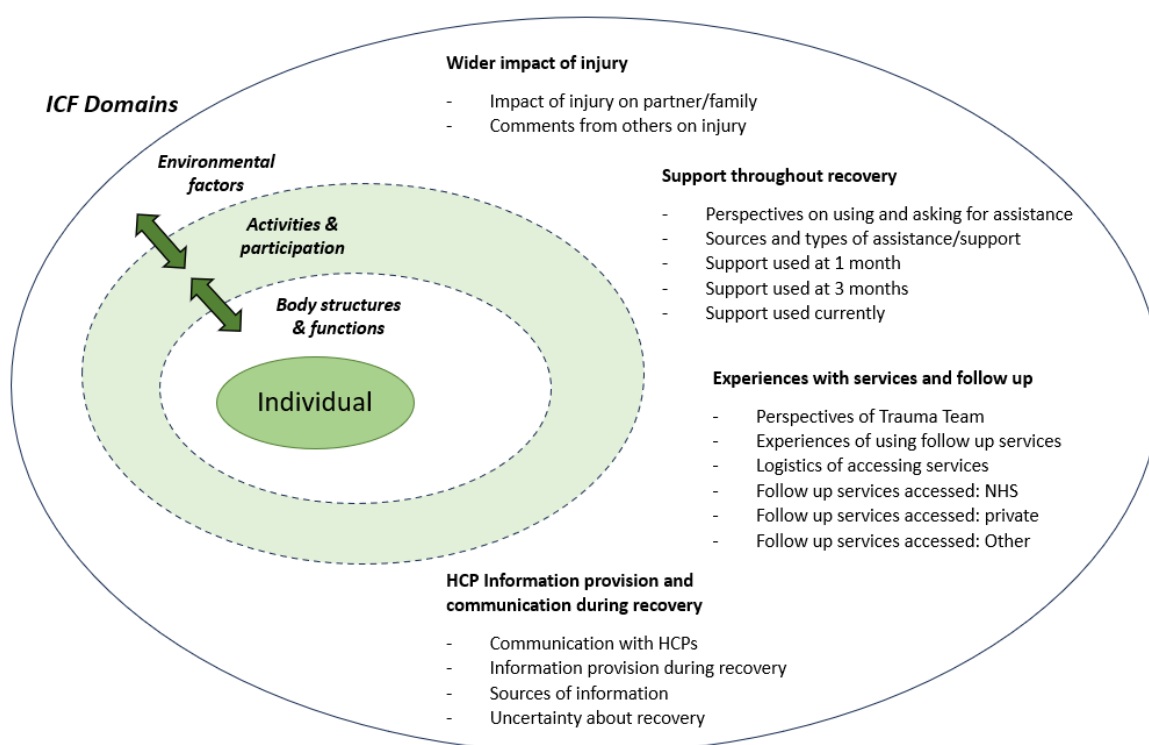
The main challenges mentioned around return to work included physical challenges such as fatigue and managing physical impairments and employer factors. These challenges have been identified in other studies, including reduced work capacity (Gabbe et al. 2014), pain and fatigue (Gavin et al. 2022). Return to work challenges related to employers reported in this study were mainly logistical, but is identified as a challenge due to employer expectations and not understanding physical limitations (Gabbe et al. 2014). Participants in this study spoke about how they were not expecting the level of fatigue they experienced. This could be due to the previously mentioned non-linear

nature of the recovery process (Norris et al. 2023), requiring participants to continually adapt their activities based on their current physical ability and the outer environmental factors.

#### 4.6.4 Theme #3: Support, services, and wider impact of injury throughout recovery

Four classes consisting of seventeen categories contributed to this theme. This theme is discussed in four parts, covering participants' experiences with support throughout recovery, the wider impact of the injury, experiences with local services and follow ups, and HCP information provision and communication during recovery.

These classes are shown in Figure 21, along with the respective categories listed for each class. These classes were identified to relate to participants' experiences associated with the "environmental factors" ICF domain.



**Figure 21 - Theme #3: Classes (bold) and Categories for the *Environmental Factors* ICF Domain**

##### 4.6.4.1 Support Throughout Recovery

This class consists of five categories, relating to participants experiences with receiving support throughout recovery. This included the sources and types of support accessed, participants perspective of using and asking for assistance, and the support used at different timepoints following injury (i.e. one month after leaving hospital, three months after leaving hospital, and currently).

**Category:** Sources and types of assistance/support

There were several main sources of support participants mentioned and these including immediate family, friends, and their wider social network.

Participants reported experiencing a great amount of support from their immediate family, including partners, children, parents, and siblings. There was a wide range of activities and tasks that immediate family provided for participants, including personal care tasks, temporary accommodation, cooking, household tasks, shopping, motivation to do rehabilitation exercises, daily visits, staying with participant for assistance, mobility assistance, general moral support, transportation, resuming leisure activities.

*“My [adult child] stayed a couple of days, then [they] had to go back home. [Their partner] was offshore and [they] to go back to [local area]. And [they] came back, almost every night to see how I was getting on, so [they] didn't leave me in limbo.” (Male, 65+ years, moderate trauma, #7)*

Several participants also mentioned the support from pets in helping ‘keep them sane’.

*“I had all my animals at home, so they kept me sane.” (Female, 18 – 44 years, major trauma, #18)*

Aside from family, participants also spoke about assistance and support from friends. The types of support were similar to tasks provided family, but involved less personal care and managing of household tasks. Friends were reported to support with tasks such as transportation, providing company, phone calls, help with manoeuvring in home environment, visits, shopping, and leisure activities. Friends were also a source of motivation and advice for rehabilitation.

*“[Friends] They were quite good at coming 'round and take me out in the car or whatever.” (Male, 18 – 44 years, major trauma, #4)*

Outside of friends, participants mentioned further support by their wider community, including neighbours, work colleagues, and delivery personnel. These individuals were reported to provide more general support in the forms of occasional transportation for appointments and to work when starting back, visits, occasional shopping and delivery assistance, and well-wishes.

*“... my colleagues were coming to collect me. So they were picking me up and taking me [to work]. And I was going out [to do usual work activity], but I wasn't doing what I would normally do, just because I physically wasn't able to at that point.” (Female, 45 – 64 years, major trauma, #2)*



Overall, there were some common types of support that participants reported receiving, mainly transportation and assistance with resuming previous activities. Participants required assistance with transportation for a range of reasons, including follow up appointments, social events like exercise classes, and work and this was provided by family, friends and wider social network. Activities that others also supported included buying a new car, resuming driving, managing an allotment.

*“I got a car in [month]. Again, my [adult child’s partner] helped me go and get one in (primary city) and choose a proper car for me.” (Male, 65+ years, moderate trauma, #7)*

One participant spoke about financial support received during recovery. They reported that the financial aspect of the recovery was the most daunting, as they were off work for around seven months, but was fortunate to have financial assistance from their family and employer.

*“I had a bit of savings, um, that got me through the time in hospital. And then it was only because - like the company I'd been with at the time, they gave me quite an okay payout. Then I knew I was okay for like a few months after that. But towards the end I had to get financial support from my family, which I've never had to do before, you know. I've never had to ask anybody for money before, but it was offered up beforehand, you know. So I was kind of lucky I did have that safety net or it kinda would have been a different story. So for me, that was the most daunting thing.” (Male, 45 – 64 years, moderate trauma, #14)*

From these findings, it was identified that participants received support from family and their social networks throughout recovery. This is similar to the findings of other studies, where family and friends are a source of practical and emotional support (Brand et al. 2018; Norris et al. 2023). There were slight differences in the types of support that different people provided, with immediate family assisting with most of the physical tasks, including caring, household tasks, and transportation. This caring burden on family and carers has been identified in previous studies for individuals with traumatic injuries (Ziran, Barrette-Grischow and Hull 2009), with the need for transportation (Christie et al. 2017) and assistance with ADLs (Sokas et al. 2023). This assistance differed slightly from the support participants reported receiving from their friends and wider social network, which was reported to include more moral support and occasional assistance with physical tasks like transportation and leisure activities. Norris et al. identified that peers provided individuals with emotional support and optimism (2023).

Assistance with transportation was mentioned throughout the initial recovery period as participants were restricted from driving due to their injuries. Participants reported requiring transportation for recovery-related follow up appointments as well as social activities and returning to work, in the later stages of recovery. Reliance on the patient's social network for transportation during recovery was identified in another study with adults with major trauma (Christie et al. 2017). Due to the geography of the North of Scotland, the restriction of not being able to drive was reported to be particularly challenging for some, similar to the findings of Kimmel et al. (2016). This finding highlights the importance of support for transportation in this population, with participants' immediate family and social network reported to be the main source. This also indicates a possible challenge for other patients that do not have as robust social support networks, as participants that spoke about accessing of SAS transportation for follow up appointments was challenging, discussed further in Section 4.6.4.3.

The role of financial assistance was mentioned by a participant in this study. The length of recovery and reduced function has been identified to have financial implications related to the loss of income as well as a negative impact on work (Gabbe et al. 2014; Beattie et al. 2018). While this participant reported they were able to manage with support from their job and family, providing information and resources about options for financial support may be beneficial for patients.

**Category:** Perspectives on using and asking for assistance

Participants spoke about needing assistance on discharge from hospital for various tasks, such as getting up stairs into their property, assistance with meals, personal care, and transportation. One participant reported that they felt like they had to ask for help quite a bit, which they found challenging. Some participants saw the reduced amount of assistance they required to be a sign of progress in their recovery.

*"... at the start, it was obviously [support for] everything. Because they cook and help me - my [partner] needed to help me wash and dress every day, for a start. So it was basically full help, definitely for the first four weeks, I would say. ... And then obviously, as time went on, things gradually got - Well, I was less reliant on people, just that - As I got like the braces, the casts off, obviously I was allowed to do more, so they had to do less, you know what I mean? It was just like, the timeline kind of worked out in sequence." (Male, 18 – 44 years, major trauma, #13)*

Participants spoke about having numerous visitors during their initial recovery. While participants appreciated the well-wishes and assistance, some had mixed feelings, as having visitors present made their recovery feel busy.

*“I had quite a few people coming up to [stay] and I had family coming up to stay just to make sure that I was all right. And so all of this was going on, so it was actually quite busy. The whole recovery phase was very, very busy, because there were people coming up constantly to to see if I was all right. ...*

*And I know it was all well-intentioned, and everybody meant well, but actually I felt I actually would have just liked to have just adjusted myself to that recovery, you know. And just had some quiet space to get used to what had happened rather than having to, you know, (laughs) be prepared for lots of people coming up.” (Female, 45 – 64 years, major trauma, #2)*

Some participants reported that they were appreciative of the support and social interactions during the start of their recovery, with one participant mentioning how surprised they were with the number of well-wishes they received.

*“So just overall, everybody - I mean, my dining room table was, I couldn't even count how many bunches of flowers and I think I had about 60-odd Get Well Soon cards and had people come to door with baking and you name it. Yeah, it was, um... Lots from different people, which was great. ... I was quite taken aback, actually.” (Female, 18 – 44 years, major trauma, #18)*

While support was valued, participants also spoke about the challenges of relying on others early in recovery. Maintaining their independence throughout recovery was mentioned as a challenge throughout recovery, with some describing they wanted to do things for themselves and feeling overwhelmed when they were not able to. One participant spoke about their experience of being in a new relationship and requiring assistance for personal care tasks like showering.

*“And things like showering - because I had to [use] like plastic bags and I couldn't get them on myself because I only had one hand... [It] was... quite intimate (laughs) because you need like, help you put them on whilst not wearing very much and then help you get into the shower. And so that wasn't like the most fun. Feel very - it feels very, you feel like you have to ask for help quite a lot.” (Female, 18 – 44 years, moderate trauma, #3)*

The participants' perspectives on relying on others for support and assistance were similar to the findings in the literature (Brand et al. 2018; Conn et al. 2023; Norris et al. 2023). The qualitative systematic review by Norris et al. identified that participants experienced a sense of vulnerability, due to their reduced functional ability and reliance on others for assistance (2023). Depending on others and loss of independence was identified to affect individuals sense of self-efficacy (Brand et al. 2018). Older adults also report a loss of independence due to injury-related limitations (Conn et al. 2023).

This sense of vulnerability and loss of independence was reported to affect participants' psychological wellbeing, with some participants finding the dependence on others at the initial stages of recovery challenging. This is another instance of the interaction between ICF domains, where a physical impairment causes activity limitations, which in turn affects the participant's psychological wellbeing. Healthcare professionals could look to facilitate independence by minimising challenges from environmental factors that would improve participants' functional abilities (i.e. providing equipment (Section 4.6.3.2) and resources on how to maintain independence, such as tips for completing ADLs one-handed (Category: Support used at one month)).

The experience of having visitors in the early recovery has not been identified in the post-acute recovery literature. In the hospital setting, visitors are an important source of support for patients' emotional wellbeing and improve patient outcomes, such as reduced pain and length of stay (Ellis 2018; Fakhry and Mohammed 2022). The participants in this study reported mixed feelings where they appreciated the support and assistance from their visitors, but also reported that they would have liked time to adjust to their current condition in the early recovery period.

At the end of the interview, participants were asked what kind of support they found the most useful at three different time points: one month after leaving the hospital, three months after leaving the hospital, and at the time of the interview. The purpose of these questions was to see if there were any types of support used or challenges experienced that had not been covered previously in the interview. Participants also were also asked what they would have found useful at the three different time points, and some provided suggestions.

**Category:** Support used at one month

At one month after leaving the hospital, participants recalled that rehabilitation-related input and support from family and friends were the most useful types of support. Rehabilitation-related input

included services like physiotherapy, pilates, and GP and included rehabilitation information, exercises, and mobility equipment. Support from family and friends was also mentioned, as well as financial support from one participant.

*“The exercises. Just the exercises and - although the documents were not very good [condition], it still inspired me to do them to get well. So, you know, they gave me exercises, so I did them.” (Female, 45 – 64 years, moderate trauma, #1)*

*“I’d probably say get out and about. Walking, seeing a lot of my pals. (pause) Aye, I think, just kinda getting on with it.” (Male, 18 – 44 years, major trauma, #4)*

When asked if there was anything else that they would have found useful in the month after they left hospital, participants reported that information and resources on how to maintain independence during the initial recovery (i.e. tips for completing ADLs one-handed) and support on how to speak to family and friends about the types and amount of support they would need on discharge. Others mentioned service-related things, such as more in-person follow ups, contact with GP, and an improved ‘link’ with physio for early rehabilitation. One participant mentioned that advice for their partner for how to approach employers would have been beneficial.

*“I guess it would have been nice to have like, tips of how to manage certain things. ... So it’s just like tips of how someone could support you or like, how you can do things. Like I figured out if I had a bag, I could put a bag on my shoulder, and then I could make a cup of tea in a jar and put it in my bag and then I could get to a seat so someone didn’t have to do it for me. But just like things like that would be quite nice to know initially that just make you feel slightly more independent.” (Female, 18 – 44 years, moderate trauma, #3)*

*“I think possibly if there was that link with the physiotherapy as well, as there is with psychology. For a follow up, I think that would just be super helpful for people.” (Female, 45 – 64 years, major trauma, #2)*

These findings indicate the importance of social support and rehabilitation-related input early in recovery. As this is the time when participants experience the least functional ability and are relying on assistance from other, this would be the optimal time to provide resources and practical tips that help enable independence, such as aids to assist with ADLs or advice on how to complete ADLs one-handed. As participants experiences with accessing rehabilitation services varied, further research into the accessibility of local rehabilitation services would be beneficial, especially as this was perceived to be important to participants’ recovery.

**Category:** Support used at three months

At three months after leaving the hospital, participants reported similar supports as one month after leaving hospital such as ongoing support from family and friends, rehabilitation-related input, and additionally, the availability of services (e.g. psychological services) was appreciated.

*“As I say, everything was explained to me on the revisits to the fracture clinic and the scans and X-rays. And you know, I could see where the breaks were mending and - All staff were excellent, you know.” (Male, 45 – 64 years, moderate trauma, #17)*

*“Again, I think I had a couple of letters offering me, you know, counselling or whatever if I needed it, which I didn't feel I did and still currently don't feel that way. ... So, yeah, I suppose there was support if I wanted it. Again, friends and family, etcetera were great.” (Female, 18 – 44 years, major trauma, #18)*

Additional support that participants would have benefitted from in the first three months post-injury included recovery-related information and access to rehabilitation services. Participants reported wanting additional information about their injury, a timeline of what interventions were done in hospital, and the long-term prognosis of their injuries. One participant reported they would have benefitted from rehabilitation, but were not referred and others that had delays in receiving rehabilitation or preferred in-person follow ups compared to virtual input. One participant suggested that early input from occupational therapists for *“giving you ideas of things that you might be more helpful for you, or help you around the house” (Male, 45 – 64 years, major trauma, #19)* would have been beneficial.

*“Like I had to wait until my first checkup for my [injury], when I came into hospital. And I went in with a list of like, So what exactly have I done? What is going on here? Like, what surgeries did you do? What didn't you do? Why? And so I had none of those answers by the time I left hospital ... So I think even if - when you got released, if it was almost like a little timeline for you of like, this is when your injury happened, these are the scans that we did, this is what your injuries are. ... So, being able to have just a sheet of paper that said everything would be really helpful, I think.” (Female, 18 – 44 years, moderate trauma, #3)*

The accessibility of psychological services was appreciated, even if it was not used by the participant. An interesting observation is all the participants that reported experiencing psychological challenges (see Section 4.6.2.2) also reported receiving support for them. This suggests that the current

methods used to offer psychological follow up has been effective for this population because participants in this study did not identify an unmet need, which has been identified in other traumatic injury populations in the UK (Kettlewell et al. 2021; Olive et al. 2022).

The ongoing need for additional recovery-related information was highlighted at this time. The timing of information provision is important and this finding highlights that participants would benefit from having recovery-related information accessible to them during the first three months after leaving hospital. Further research would be beneficial to develop an information provision plan for patients with the aim to improve information provision throughout recovery.

**Category:** Support used currently

At the time of the interview, some participants reported that they were not receiving any ongoing support. One participant reported that they were grateful for ongoing support from their neighbours. Several participants were accessing private rehabilitation services, some through ongoing compensation claims. Other participants mentioned that they were receiving ongoing medical input for conditions unrelated to the injury.

*“...the insurers don't want to close off the case because they were kind of expecting me to have ten [private psychology] sessions or 12 or 15 sessions, you know, ongoing and privately to fix myself. And I said, 'No, no, I'm okay.' But that's that's partly what they're working to now. So they're going to make sure that I can have that within their insurance claim if I need to have that, that that will all be taken care of because it can take a long time to, to get right.” (Female, 45 – 64 years, moderate trauma, #1)*

*“The support I've had has been moral support with my neighbours, very good neighbours. I go regularly to, especially two different neighbours, go along for a cup of tea... and in fact, I'm going out with them tonight for a [society concert]. ... So I've good support from the neighbours.” (Male, 65+ years, moderate trauma, #7)*

Some participants reported that they did not require any additional support at the time of the interview. One participant reported that they would benefit from a higher-level rehabilitation option with a knowledgeable instructor for when the initial rehabilitation finished.

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*“Well, I mean, the physio was kind of finished quite a few months back, but I don't know, maybe some sort of like club where you're like, going with other people that's had like injuries and stuff like that, where you're like exercising together, you know? Maybe something along that lines. ... More like, just training together with someone that is aware of, you know, like a personal trainer that has worked with people that have suffered injuries. That knows how to rehabilitate you, you know. Because I mean, I'm still at a point, I'm still like - It'll be two years in [month] and there's still quite a bit of like, mobility that I have to work on yet, you know. But as far as like the stuff from the hospital, that's me finished now, isn't it?” (Male, 45 – 64 years, moderate trauma, #14)*

Some participants reported they were still actively engaging in rehabilitation services at the time of the interview through the use of private services, suggesting the need for longer term rehabilitation options for this population. It has been recognised that individuals with major non-neurological trauma experience physical activity restrictions that can last several years post-injury (Ekegren et al. 2020). Ekegren et al. also identified that the financial strains associated with the injury and recovery was a barrier to participating in physical activities such as swimming, using a gym, or specialised equipment (Ekegren et al. 2020).

A suggestion from one of the participants in this study was to offer higher-level rehabilitation classes to continue to improve their functional ability. This need for supervised community-based exercise options after the initial rehabilitation was identified by Ekegren et al., as participants reported the lack of guidance to be a barrier to engaging in physical activity post-injury (2020). This could involve collaboration with either physiotherapy services or local gyms to provide guidance to enable patients to continue to improve their functional ability beyond the initial rehabilitation phase, as some participants in this study reported they still had moderate problems with mobility, usual activities, and usual activities at the time of the interview.

These questions around the timing of support identified that participants found recovery and rehabilitation-related information most useful in the first several months after leaving hospital. This highlights the importance of information and access to rehabilitation for patients as they start to gain functional ability and independence early the recovery process. Healthcare professionals can assist by providing information and strategies to improve supported self-management. In the medium to long term, availability of psychological support services was valued, with the identified need for higher-level rehabilitation opportunities. Support was mentioned as being useful at all three timepoints, indicating the importance of social support throughout the length of recovery. This is



similar to the findings of other studies (Brand et al. 2018; Norris et al. 2023), although the findings from this study indicate slight differences in the types of support that are provided by different people in the participants' social network.

#### 4.6.4.2 Wider Impact of Injury

This class consisted of two categories, in which participants spoke about the impact of the injury and their recovery had on partners and families and experiences of receiving comments about their injury when out in public.

##### **Category:** Impact of injury on partner/family

Participants spoke about how the injury had an impact on their partner and immediate family throughout their recovery. There were a number of tasks that participant's reported their partners assisting with in the initial recovery, including managing household tasks, preparing meals, taking care of other family members, adapting the home environment, and providing full assistance (i.e. caring tasks, sourcing wheelchair), handling legal and insurance matters, providing transportation for the participant to follow up appointments and social opportunities, oftentimes on top of their own previous responsibilities.

*"... my [injury event] and this trauma severely disrupted the life of everybody around me, as well. Particularly my [partner], [their] workload increased tremendously. We have two young children. On top of all the legal and the police and the insurance hassles, which [they] were dealing with entirely by [themselves]. [They] were also managing the house and the kids." (Male, 45 – 64 years, moderate trauma, #6)*

One participant spoke about the impact of the injury on their family and described how their family was not prepared for how they would be when leaving hospital.

*"Participant: ... You know, so I don't think people necessarily prepared your family, for, you know, how incapacitated you would be or how would affect them necessarily.*

*Interviewer: Okay. Do you mind kind of talking a bit more about that?*

*Participant: Yeah, not at all. I think - my children are now like, well, they would have been probably about [teenagers] then, ... But my [partner] works full time. I've always worked part time. So because of that, I tend to pick up, sort of the majority of the household tasks. Some of which my [partner] had never had to do in [their] life, you know, and so it's suddenly kind of - so [they] were thrown into that when I went into hospital. And obviously then had to continue to try and work and support. ... Yeah, it was very hard on them, you know, as well. So I think, if somebody didn't have that - or you have that, nobody really prepares them, I don't think? For how things are going to be and how much more they're going to have to help." (Female, 45 – 64 years, major trauma, #21)*

Participants also spoke about how other family members that lived locally also helped out by staying with participant or visiting regularly to help with ADLs and household tasks, provide reprieve for partner, meals, and caring for other family members and pets.

*"so my [parent] stayed, I think it was about two weeks [they] stayed here with me. Because my partner had to go to work and whatever else. Um, so I've got - I mean, the main reason [they] stayed with me is I've got [multiple animals] to look after. So it was more to look after them than, than specifically me, to be honest. Um, so [they] stayed with me a couple of weeks." (Female, 18 – 44 years, major trauma, #18)*

Participants in this study spoke about the impact that the injury had on those around them, mainly in terms of the additional responsibilities that were held by their partners and immediate family following the injury and throughout recovery. The impact of caregiver burden is documented in the literature, with a high prevalence of literature on caregiver burden for informal carers of individuals with neurological injuries (Manskow et al. 2015; Charlifue et al. 2016; Lieshout et al. 2020). There is a growing body of literature on caregivers' burden and experiences with caring for individuals with severe non-neurological traumatic injuries (Newcomb and Hymes 2017; Heathcote et al. 2021; Hudson, Radford and Kettlewell 2022), indicating that caregivers experience declines in multiple aspects of wellbeing (i.e. mental health, resilience) during the months post-injury. These findings highlight the importance of availability of support for carers during recovery of the injured individual.

Some ways to support patients' partners and immediate family suggested by participants in this study included signposting carers to resources such as vocational support, signposting resources for carers, and financial support resources. This was found in another study, where participants suggested that providing resources for practical assistance services could reduce strain on the

patient's family and the patient-carer relationship (Brand et al. 2018). Further research into family and informal carer's perspectives in the North of Scotland would be beneficial to learn about their experiences and needs to be able to support them through the recovery of the patient.

**Category:** Comments from others on injury

One participant spoke about the experience of strangers commenting on their injuries.

*"Like I found when I started leaving the house and was able to, even when I was still on crutches and it was sort of four-point walking kind of thing. People would stop me and want to know or want to talk about it. ... it was a lot of - old men were very good at stopping me and telling me that I'm going to get arthritis. It's almost like every time I left the house... Like very random comments from a lot of people, which most the time I found quite funny. But like – that's great, I've been locked my house all day. I've come out and three people just told me I'm going to have arthritis. This has been fun." (Female, 18 – 44 years, moderate trauma, #3)*

While the comments were not all negative, the participant found people asking about their injuries challenging because they lacked information and knowledge of their injuries when leaving hospital and needed to wait until follow up appointments to get further information. This participant suggested that this situation could have been improved if they had been given information on discharge from hospital, including a summary of their injuries, prognosis information for injuries, and interventions done in hospital, as this would have been helpful for them in handling these situations.

*"I think that adds to your sense of autonomy because you don't know what your injuries are and then you leave hospital and people are like, 'So what have you done?' And you're like, 'I don't know. But I can't walk, my arm's sore, and I can't sit up in bed without crying. I don't know what's wrong'. And it feels quite like things have been done to you rather than this whole person-centered care [idea]." (Female, 18 – 44 years, moderate trauma, #3)*

This suggestion of providing a written summary on discharge from hospital is discussed further in Section 4.6.4.4. In speaking with clinicians at the NoS MTC, it was identified that comprehensive written discharge summaries are prepared for patients with neurological injuries that receive specialist in-patient neurological rehabilitation, but that this is not currently done for the non-

neurological patients that are discharged home from the NoS MTC. Further consideration into the content and format of information provision that would be beneficial to patients on hospital discharge should be reviewed in the NoS MTN, which could be investigated using a co-production research strategy to incorporate patients' perspectives.

#### 4.6.4.3 Experiences with Services and Follow up

This class consists of six categories, relating to the participant's perspectives and experiences using services for follow up and rehabilitation. The topics discussed in the interviews included perspective and role of the trauma team, experiences of using follow up services, logistics of accessing services, NHS services accessed, private services accessed, as well as other services that were accessed throughout recovery.

#### **Category:** Perspectives of Trauma Team

Multiple participants reported interacting with the trauma team after leaving the hospital. These interactions were reported to be positive, with participants reporting an ongoing connection due to follow up calls and was useful to know that resources were there, even if they did not use them.

*“Participant: I did get a nice phone call from a [person] on the trauma team to see how I was doing and all that. Yeah, I felt like there was an ongoing connection with that, you know. So they achieved, I think, what their objective must be.*

*Interviewer: And what do you think that is?*

*Participant: Well, I think to - primarily to join up the siloed disciplines, so this holistic view - But then that's no good unless the patient feels like they're part of an ongoing interest in their well-being, and I think that must be part of their stated objective.” (Male, 65+ years, moderate trauma, #11)*

The trauma team was reported to have multiple roles, including providing follow up calls and consultations, communicating with other HCPs, offering psychology services, and for one participant, working on a legal review case. Follow up provided by the trauma team was reported to be useful, with face-to-face and virtual options mentioned.

*“... that was meeting with the consultant there [local rehabilitation hospital], who was brilliant as far as I was concerned, from [dates], when that was our last*

*meeting. And although it was Covid, [they] were quite happy to be hands-on, face to face meetings, which was a bit unusual because the only thing I had before that was e-consults to your local doctor and that was never really - it was quite frustrating and, never really satisfactory.” (Male, 65+ years, major trauma, #15)*

Participants reported contacting the trauma team for multiple reasons including rescheduling follow up appointments to the participants’ local hospital, contacting medical staff with their questions, and follow up on a subsequent injury.

*“So the trauma team were great in hospital and then were great with a follow up after hospital and because it was just having a number to contact if I had questions and then they would find out who I actually needed to contact, which was really nice rather than having to sort of hunt around and find numbers.”*

*(Female, 18 – 44 years, moderate trauma, #3)*

Multiple participants mentioned appreciating the link the trauma team had with the psychology service and availability of the services, even if the services were not used.

*“And they’ve got that really good link with the psychology team to come and see you. ... because obviously the trauma team have got that link with the psychology team who come in and say, ‘You know, if you’re struggling with recovery, you know, we’re here. You know, if you’re struggling mentally, we’re here for a year’, and that’s that’s excellent and they’ve got that service.” (Female, 45 – 64 years, major trauma, #2)*

*“... I didn’t utilize everything that they offered. But because I knew it was there, it was quite useful. So I didn’t utilise the psychologist for quite a long time. And then I could still call up and be like, ‘Actually, I do want a session’.” (Female, 18 – 44 years, moderate trauma, #3)*

Participants valued the multiple services that the trauma team provided, including the follow up calls and review consultations, communication with other HCPs, and long-term accessibility and follow ups from the psychology service. Participants also appreciated the accessibility and having a contact number for asking questions after leaving the hospital. Since its launch, the NoS MTN has incorporated practices from the literature and national guidelines for improving follow up care, such as phone call follow ups several weeks after discharge from hospital (Wake E. et al. 2022), having a single point of contact for patients and families (e.g. trauma coordinators) (Ross and Ashby 2016; Braaf et al. 2018; NICE 2022), and working closely with psychology services (Kettlewell et al. 2021;

Olive et al. 2022). These aspects of the trauma service were spoken about positively in the interviews, indicating that participants valued the role of the trauma service in their recovery.

**Category:** Experiences of using follow up services

Experiences of accessing follow up services varied, including both positive feedback and challenges on accessing services, service delivery, and participant expectations for follow ups.

Participants reported positive interactions with individual HCPs that they worked with and were grateful for the care they had received. One participant reported that their relationship with their GP was helpful to their recovery. Participants spoke about how they received rehabilitation equipment when it was needed. Follow ups were seen as a way to monitor progress, with participants reporting that these signified when they were able to progress movements, weightbearing status, and mobility.

*"[Their GP's] been amazing. And I did ask [them] questions that were in my head and all these extra things and that but - and [they] were very reassuring about everything." (Female, 65+ years, moderate trauma, #9)*

*"I got all the basic things and filled in questionnaires at the hospital and got things like bath seats and the zimmers and other bits and pieces to take home with me when I first came home." (Male, 45 – 64 years, major trauma, #19)*

Several participants reported the importance of mental health support and appreciated having psychological support throughout recovery. Participants mentioned that even if they didn't use the psychology service, they appreciated that it was open to them for a while after the injury in case they changed their mind.

*"I [had] a video call with them [community neuropsychology] on the [date] and... Which was just absolutely fantastic. Everything said made complete sense to me." (Female, 45 – 64 years, moderate trauma, #1)*

*"they [psychologist] came to see me before I left [hospital] and gave me all the paperwork and all their cards and everything, so I could have contacted them at any point should I have needed to, but I didn't need to. But I thought it was nice that they did follow up with the phone call six months later to, to see." (Female, 45 – 64 years, major trauma, #2)*

Some spoke about the challenges they experienced with follow ups, which included situations such as a long commute to a follow up appointment for a short conversation with the HCP, a lack of resources offered, and local HCPs demonstrating a lack of knowledge about the injury.

*“Went through to it - from where I stay, drove about an hour and a half, to go in a room for two minutes, basically telling me I was fine. ... And thats 'Just get back tae it'. Just take it light and easy again for two weeks and then go back to normal. ... I was only in five minutes. An hour and a half [drive] for five minutes.” (Male, 18 – 44 years, major trauma, #4)*

*“There seems to be a bit of lack of knowledge of my accident. As in, you know, what I actually did to myself. So they [local HCPs] seem a bit sort of blasé about it, in a way. So like, I've had a few problems with my sinuses because I did damage them in my accident. ... But my local surgery don't seem to quite understand that. And, um, they were kind of [like], 'Well, but you need to get a letter from (regional hospital) to tell us that'. And I said, 'Well I don't know how to get that. That's, you know, you. You speak to the other doctors, not me'.” (Female, 18 – 44 years, major trauma, #18)*

In terms of service delivery, participants reported challenges such as limited in-person follow ups impacting on their recovery, delays and gaps in seeing services such as the GP and physiotherapy, and poor communication after outpatient follow up investigations. Several participants reported that they did not feel they were treated holistically for their injuries or receive person-centered care.

*“... they sent me for another scan to see. But then I got no feedback and no response for three months. So I think by [month], I was not in a great place because my leg was moving in ways it shouldn't have moved and I couldn't get hold of anybody to look at - when I came back to (primary city), the physio clinics didn't transfer me back, so there was a huge gap in physiotherapy when I got back to (primary city). Which I eventually got back on their radar. But the surgeon didn't call me back for about three months.” (Female, 18 – 44 years, moderate trauma, #3)*

*“So I would say that, although I'm grateful to everybody for saving my life and fixing me up pretty good, I think that I was not treated holistically for, as a [whole] for all my injuries, but rather I was treated by orthopedicians for my orthopedic injuries and nobody - despite repeatedly pointing it out [the nerve injury]. I*

*wouldn't say it was fobbed off, but the standard line given was that, 'You know, nerve injuries are complicated and nerves grow very slowly and we'll give it eight weeks or 10 or 12 weeks and it will come back. Or it might come back and then we'll see what to do about it then' ... so that management could have been more proactive from that perspective." (Male, 45 – 64 years, moderate trauma, #6)*

Some challenges related to the participants' expectations for follow up not being met, such as not receiving expected rehabilitation or input from GP, and the type of treatment modalities used in rehabilitation services.

*"... this is where it falls slightly down. Because I was told I could have physio and that I could attend a rehab class, what they called a rehab class. Now, as far as I remember, it was up in (local rehabilitation hospital), but I never ever got that. Because I was looking forward to that, just to - I wasn't sure how much I should push myself to get over all this, and - But it never came. I never got it. I never got the physio and I didn't get the rehab." (Female, 65+ years, moderate trauma, #8)*

*"I had a few [physiotherapy] appointments. Um, and they just asked how I was getting on and maybe would give me some different exercises. And if I was- didn't understand one, they would show me how to do that. They didn't actually do how - what I understood physio, well, it used to be physio - that you got about half an hour of physio and just straight physio, but um, they didn't seem to do that now. (laughs) Well, not at that time. They just asked how you were getting on and had a look to see if I was doing things properly, but that was it. And maybe watched me walking and that was it." (Female, 45 – 64 years, major trauma, #10)*

Participants had varied experiences with the accessibility of services, with some reporting positive experiences like quickly accessing physiotherapy following discharge from hospital, use of tele-medicine from local hospital to reduce travel, having contact numbers for rehabilitation HCPs, and rescheduling follow ups to take place at the participants' local hospital.

*"... it [tele-medicine] was so handy being able to only having to go to (rural local town) for the first couple, rather than trailing into (primary city). Because I go by bus if I've got to go to (regional hospital) and I didn't fancy doing that with crutches or zimmer frames, but certainly - so going to (rural local town) and doing the tele-med I thought was brilliant." (Female, 65+ years, moderate trauma, #5)*



Some participants reported not accessing rehabilitation service, but that this did not impact on their recovery.

*“... there was no meetings with the physiotherapy department up at (regional hospital) because it was shut, (laughs) nobody there. But it didn't bother me, you know - I didn't think I was missing out on anything because what I was doing here would just be replicated by what the physios would have been giving me ... So I had absolutely no problem” (Male, 45 – 64 years, moderate trauma, #17)*

Some reported challenges with accessing services such as delays in rehabilitation services such as physiotherapy, unable to contact medical staff following outpatient investigation, lack of face-to-face consultations (some related to covid restrictions).

*“Nobody has come to see me since I left hospital. And after a couple of months, I decided - I went into my own medical centre to see my doctor. But I never got to see them. And I've never heard from [them]. Nobody has been to see me since then.” (Male, 65+ years, major trauma, #12)*

*“I think because of Covid, the restrictions were in place, so that it made contact and face-to-face with the NHS difficult, to say the least. ... As I said, it was more around - If someone had seen me face-to-face, they would have perhaps understood more about how I was struggling.” (Male, 65+ years, major trauma, #15)*

Participants valued access to rehabilitation services and spoke of the positive impact these services had on their recovery, which has been found in other studies (Slaney et al. 2014; Christie et al. 2016; Claydon, Robinson and Aldridge 2017; Brand et al. 2018). Positive communication and relationships with participants' HCPs were viewed as a positive aspect of recovery, similar to the findings of the synthesised finding in the systematic review (Section 2.7.5.4). This findings demonstrates the value of access to rehabilitation service and interactions with HCPs during recovery.

A number of challenges were identified relating to various aspects of service delivery, expectations of services and rehabilitation, and reported a lack of access to services. Some challenges surrounding service delivery, such as limited in-person follow ups and delays or gaps when accessing services, could have been impacted by the changes to service delivery during the Covid 19 pandemic, but similar challenges have been described in regards to service delivery in other trauma networks in the UK, such as inconsistent service provision across large geographical areas (Kettlewell et al. 2021), indicating further research on accessibility of rehabilitation services is necessary. Patients'

expectations of services has also been identified as an area of improvement in trauma services in England and suggesting that improved information provision could help form realistic patient expectations of services (Beckett et al. 2014). Participants' expectations of care determined whether they perceived the care to be adequate and person-centred. Person-centred care involves "treating patients as individuals and as equal partners in the business of healing" (Coulter and Oldham 2016 p. 114). Delivering person-centred care to the traumatic injury population requires a flexible, multidisciplinary approach (Norris et al. 2023), as each patient's experiences are unique. Aspects for HCPs to consider in the delivery of person-centred care are discussed further in Section 0.

**Category:** Logistics of accessing services

Relating to the experiences of using the services, the logistics of accessing services for rehabilitation and follow up were discussed. Participants accessed services both in-person and virtually and shared the strengths and drawbacks of accessing services in these alternative ways.

In-person services accessed included the fracture clinic, neurosurgery consultant, GP, private surgeon, and multiple physiotherapy services (i.e. out-patient, community, home visit, hand physio clinic, private). One participant reported they appreciated having hands-on consultations with HCPs and found it beneficial. Several participants reported a challenge with in-person follow up was the commute to getting to the hospital, especially when the information covered in the appointment was generic.

*"In [month], I met with, the rehab medical people at (local rehabilitation hospital). And that was a thorough examination of me, to see how I was." (Male, 65+ years, major trauma, #15)*

*"... and then I had another one [visit], up at (local rehabilitation hospital)... But it was like, I think that was a wee bit of a waste of time. It would have been better as like a video call like this. ... there was, some accident happened and the traffic was backed up. ... So it was sitting in traffic for ages and then it was just like - the actual meeting, it was ... very generic, you know what I mean? I just thought, 'You coulda done that over the video call, really'." (Male, 45 – 64 years, moderate trauma, #14)*

Participant reported accessing services virtually as well. These included HCPs and services such as consultants, GP, physiotherapy, and psychology. The strength of the virtual follow ups was the reported convenience. One participant reported having a positive virtual hand physio where the

equipment was sent through the post and sessions took place on MS Teams. Another participant described that virtual follow ups were beneficial when the information shared was more general. One participant had a positive experience using tele-medicine, where they were able to have investigations completed at their local hospital and then have the scans sent to their consultant in the regional hospital and have them explained via video conferencing during the same appointment.

*“It [physiotherapy on MS Teams] seemed a bit funny, but it worked. (laughs) Yeah, because [the hand physiotherapist] sent like a putty and things to squeeze and this, like a, blood pressure collar? And you had to squeeze it and she was able to measure the strength of my grip. It could measure my hand and it [screened] and everything.” (Female, 45 – 64 years, major trauma, #10)*

*“Participant: [Telehealth’s] A good idea, you know, and it was so handy being able to only having to go to (rural local town) for the first couple, rather than trailing into (primary city). Because I go by bus if I’ve got to go to (regional hospital) and I didn’t fancy doing that with crutches or zimmer frames, but certainly - so going to (rural local town) and doing the tele-med I thought was brilliant.*

*Interviewer: Okay. And so, do you mind going into the tele-med a bit? ...*

*Participant: I went to the hospital and they X-rayed it [injured joint]. And then I sat in a chair and the nurse was there and they were summoned up the tele-... communication with (regional hospital). And the surgeon who’d obviously had a look at the X-rays, came and sat in front of the screen, so we could see him and he could see us, and he just said it was all okay. ... The first time was perfect. The second time, they couldn’t get the sound to work on the screen. So what they did was phoned up and the nurse had the phone and we went backwards and forwards that way, you know, which I thought showed a certain amount of ingenuity on their part because it did what we needed to do. It was all over in sort of five minutes.” (Female, 65+ years, moderate trauma, #5)*

Some participants spoke about the challenges of virtual follow ups and these related to participants not satisfied with virtual consultations, with some mentioning that it lacked the ‘hands-on’ aspect which was valued by some and lacking discipline with virtual physiotherapy.

*“... the only thing I had before that [in person appointment] was e-consults to your local doctor and that was never really - it was quite frustrating and, never really satisfactory.” (Male, 65+ years, major trauma, #15)*

Other logistical aspects of accessing services included transportation and use of open appointments. Several participants reported that they relied on their social connections for transportation. One participant spoke of the transportation challenges of living in a remote and rural area: *“Neighbour ran me there [follow up appointment]. Because patient transport is just a theory in (rural remote area). It doesn't really exist.”* (Male, 65+ years, moderate trauma, #11). One participant was able to access SAS transportation initially for appointments and found it beneficial. Throughout this participant’s recovery, they reported that they were unable to access SAS transportation later on and that meant that they relied on their social network for transportation to appointments.

*“For a long time, I needed an ambulance service, so the Scottish Ambulance Service would come and pick me up from my house and take me to the hospital and bring me back. That service was absolutely fantastic. It got harder and harder to access. ... but the ambulance service, when it worked, was extremely useful because they were professionals. They were able to take care of me and I was still walking very unsteadily and very I was very weak and they took very good care. They knew what to do and how to do it. So it was very, very useful having that service.”* (Male, 45 – 64 years, moderate trauma, #6)

Several participants mentioned the use of open appointments, or patient initiated follow up where the participant was able to contact the service with any issues before an agreed upon date. Participants reported having positive experiences with this.

*“And one of the things that they did that I really liked was that - I think they are also short staffed and stretched - but they gave me these open appointments that I could come back any time before October or something like that. And that was very useful, even if I felt I was okay, I went in just for a 30 minute chat and they looked at me and they gave me some new exercises and I thought that was very effective use of their time.”* (Male, 45 – 64 years, moderate trauma, #6)

In this study, participants reported using both virtual and in-person services. This study identified that participants appreciated the convenience of virtual follow ups, while the drawback was the lack of ‘hands-on’ aspect that some participants valued. In-person follow ups were valued because of the ‘hands-on’ aspects, but required the participant to physically go to the hospital or clinic, which was a challenge for some due to transportation and functional limitations. Providing patients with a choice of virtual and in-person follow ups, where possible, could be a way to implement person-centred care.

Transportation to follow up appointments was reported to be a challenge in this study, especially for those living in rural and remote areas. This has been mentioned in other studies (Kimmel et al. 2016; Christie et al. 2017; Reeder et al. 2021; Duchin et al. 2022). One way to minimise transportation challenges was through the use of virtual services. Telehealth refers to “the use of information and communication technology to deliver health services over distance” (Wake et al. 2020 p. 412). A scoping review by Wake et al. found that telehealth is already used in many traumatic injury populations (e.g. TBIs, SCIs, multi-trauma, burns) throughout the care pathway, including rehabilitation and follow up (2020). Telehealth is currently used as a way to assess needs of patients and deliver rehabilitation interventions (Shiner et al. 2021). As the timing of this study was at the end of the Covid 19 lockdowns, participants received a mix of virtual and in person services and had mixed perspectives on both in-person and virtual follow ups. As pressures on health systems continue to rise, maintaining the option of both virtual and in person follow ups has been shown to be beneficial for both patients and HCPs (Wake et al. 2020; Shiner et al. 2021), particularly as participants in this study valued the convenience.

**Category:** Follow up services accessed: NHS

Participants were asked about the services they accessed throughout their recovery and many different NHS services and specialties were accessed throughout the recovery journey (see Table 30). Services accessed included medical input from consultants, GPs, subsequent readmissions to hospital, fracture clinic, as well as rehabilitation services such as physiotherapy and psychology. Other NHS services included pharmacy, trauma team, eye clinic, and community nursing.

**Category:** Follow up services accessed: private

Private services were also used throughout recovery, which was reported to be either self-funded or accessed through insurance compensation claims relating to the injury. The different private services accessed are listed and described in Table 31, including psychology, neuro-linguistic programming expert, consultants, pilates, massage, occupational therapy, physiotherapy. Some participants that used private services spoke about how they would be worse off if they had not had the additional input.

*“So had I not had the private physio, I feel that my recovery would have been worse off for it and I would have ended up consuming more resource from the NHS, from that perspective.” (Male, 45 – 64 years, moderate trauma, #6)*

**Category:** Follow up services accessed: Other

Aside from NHS services and private services, there were other services and forms of assistance that were used.

Some participants spoke about the involvement of insurers and compensation claims following the injury. One participant reported that having insurers involved impacted on return to work process, another participant had ongoing compensation claim which included separate medical assessments. Insurers also provided resources such as additional private services and funding for equipment, which were valued.

*“... they've [the solicitors] been good. My [partner], [they] deal with a lot of it, but we're hoping that we're on the last leg (laughs) of the journey now. But I've got some more medicals to go through and that for them to see it - because I'm never going to be back to what I was before. And they'll be deciding about that.”*

*(Female, 45 – 64 years, major trauma, #10)*

*“... there's a compensation claim going on and although that's not - it won't be finalized for a while because they want to see how I recover after my operation. But I've had 2 or 3 things going on. And one is I had a separate medical assessment on the [date], and that was basically my solicitor's case for the compensation claim. ... And we've had numerous phone calls and they've supplied all sorts of things to help me with mobility and what have you. Everything from something that will help me get my socks off and to a brand new recliner chair that arrived, (laughs) and other odds and sorts there.” (Male, 45 – 64 years, major trauma, #19)*

One participant spoke about assistance they received from their partner who was an HCP. They described it as a unique experience and that they valued the information from their partner.

*“So, yeah, husband and wife. Well, suddenly it becomes [HCP] and patient, and that's -People are good at adopting the patient role, aren't they?” (Male, 65+ years, moderate trauma, #11)*

*“Interviewer : And did you feel like you got enough information, like after leaving the hospital?”*

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*Participant: Only from my [partner], really. But that would have come otherwise, I guess. [They] were doing what they [follow up services] would have done.” (Male, 65+ years, moderate trauma, #11)*

In this study, participants reported accessing a wide range of NHS services (Table 30), as well as private services (Table 31). Many of these services were also mentioned as sources of information for participants (i.e. medical staff, psychology, physiotherapists, pharmacy) (Table 32), indicating that participants sought input and information from a wide range of HCPs. Physiotherapy was reported to be accessed throughout recovery, similar to other studies noting the important role of physiotherapy in rehabilitation and recovery (Christie et al. 2016; Claydon, Robinson and Aldridge 2017; Ekegren et al. 2020; Silvester, Trompeter and Hing 2021). The use of psychology services was also noted, as previously discussed in Section 4.6.2.2. This finding indicates that patients access multiple services throughout recovery, which could be a reason for the reports of receiving mixed information or communication, highlighting the importance of collaboration of services to deliver person-centred care.

Participants described use of private services to be beneficial for their recovery. The types of private services that were accessed included psychology, medical input, physiotherapy, occupational therapy, massage, and pilates classes. Some of these private services were provided by insurers and participants described experiences of managing compensation claims and speaking with solicitors throughout recovery. Others used private services as a way to maintain their rehabilitation and reported they were self-funded. The use of private services to augment NHS services in the traumatic injury population also identified in the study by Silvester et al. (2021), where 77% of participants reported supplementing the NHS rehabilitation with additional interventions (e.g. private services, gym memberships, psychological support). While it is possible that some of the participants would have engaged in some private services regardless (i.e. gym memberships, exercise classes), participants reported accessing services like physiotherapy and psychology to address injury-related issues, which suggests an unmet need for further services and would benefit from further research into accessibility of services 1-2 years post-injury.

Participants suggested that the trauma service should consider having a “link” with physiotherapy services similar to the link with psychology services, referring to long-term accessibility of the service. This was supported by the fact that a number of participants reported using multiple physiotherapy services (e.g. outpatient, community, private) throughout recovery. The EQ-5D responses indicate that some participants were experiencing moderate to extreme problems with

mobility, usual activities, and pain/discomfort (21.1%, 10.5%, and 26.3%, respectively) at the time of the interview, which are physical and functional aspects that could benefit from further physiotherapy input. Further research is needed to determine the feasibility and how this could be implemented, as patients are usually referred to the appropriate community physiotherapy services on discharge from hospital, but this findings suggests that there is a need for greater accessibility to physiotherapy services throughout recovery for some patients with traumatic injuries.



**Table 30 – NHS Services Accessed**

NHS Services Accessed	Purposes	Participant Quotes
Medical input	<ul style="list-style-type: none"> <li>- Cleared for return to work</li> <li>- Scans (i.e. X-ray, CT, MRI)</li> <li>- Removing stitches/staples</li> <li>- Removing cast</li> <li>- Progress weight-bearing status</li> <li>- Monitor injury healing</li> <li>- Tele-med consultations</li> <li>- Physical examinations of injury healing</li> <li>- Knee replacement</li> <li>- Input for unrelated conditions</li> </ul>	<p><i>“Just one [follow up]. That was about, just before I went back to work, they got the all clear. That was about nine weeks after came out of hospital.” (Male, 18 – 44 years, major trauma, #4)</i></p> <p><i>“I went back for x-rays. ... And the x-rays still showed that I needed to wear the collar.” (Female, 65+ years, moderate trauma, #8)</i></p> <p><i>“And when they did a [MRI] scan, they found there was an issue with my sort of, the bottom of my neck, top of my spine.” (Male, 65+ years, major trauma, #15)</i></p>
Readmission to hospital	<ul style="list-style-type: none"> <li>- Follow up surgeries/fixations</li> <li>- Infection of injury area</li> </ul>	<p><i>“I then had a night in (regional hospital) again, and that Wednesday night, because I had an infection in the two places that I had my stitches.” (Female, 18 – 44 years, major trauma, #18)</i></p> <p><i>“I had to return for an appointment on the [date] and that ended up being an overnight stay because I needed to get the thumb wired. Because it wouldn't stay in place.” (Female, 45 – 64 years, major trauma, #2)</i></p>
Fracture clinic	<ul style="list-style-type: none"> <li>- Scans (x-rays)</li> <li>- Checking cast</li> <li>- Assessing healing progress of fractures</li> <li>- Establishing need for further surgery</li> <li>- Progress weight-bearing/movement in injured joints</li> </ul>	<p><i>“The follow ups were in the fracture clinic. Um, I went back to the fracture clinic, I think, again for three different separate appointments just to get X-rayed and go over the X-rays.” (Male, 45 – 64 years, moderate trauma, #17)</i></p> <p><i>“Then I had another fracture clinic on the [date], and that was when things - I already knew by, things weren't progressing very well. And that's when they first indicated that further surgery might be required.” (Male, 45 – 64 years, major trauma, #19)</i></p>

<p>GP</p>	<ul style="list-style-type: none"> <li>- Removing stitches</li> <li>- CBT treatment</li> <li>- Analgesia prescription</li> <li>- Referrals to other HCPs</li> <li>- Psychological support</li> </ul>	<p><i>"I had to get in contact with the GP, sort of couple of weeks after I got home because I was having quite a lot of flashbacks and not sleeping at all well." (Female, 65+ years, moderate trauma, #9)</i></p> <p><i>"I realized my neck was very sore, you know. And that's when I went to a local GP and he prescribed physiotherapy and I went to see the physiotherapist..." (Male, 65+ years, moderate trauma, #7)</i></p>
<p>Physiotherapy (community, out-patient, virtual and in-person)</p>	<ul style="list-style-type: none"> <li>- Assessing joint movement and strength</li> <li>- Explanation of injuries</li> <li>- Advice on related conditions (e.g. bursitis), positioning, sling use, activity levels</li> <li>- Providing equipment – theraband, hand therapy equipment</li> <li>- Progressing mobility and exercises</li> <li>- Personalized exercise plan</li> <li>- Exercises – strengthening, pain management</li> <li>- Communicating with other HCPs</li> <li>- Telephone follow ups and check ins</li> </ul>	<p><i>"So initially it [physiotherapy] was to sort of start to increase the range of movement and and then ultimately in the latter stages, it was to start to increase strength because I just hadn't been using it." (Female, 45 – 64 years, major trauma, #21)</i></p> <p><i>"they [physiotherapy] were asking you like what you did, so they would tailor make your programme to suit you sort of thing. But no, they were quite good at chasing things up and sorting things out." (Male, 18 – 44 years, major trauma, #13)</i></p> <p><i>"The [goal for physio with the] wrist was just keeping the fingers moving. With the leg - I developed a bursitis on my opposite leg because it was taking most of the strain. So I got advice on that. And then - a lot of it was quad setting, making sure I could get full extension and hip strengthening exercises for hamstrings and quads." (Female, 18 – 44 years, moderate trauma, #3)</i></p> <p><i>"They gave me the stretch bands to use, which I carried about in my pocket and used them constantly and really, really worked hard to to get back, which was good." (Female, 45 – 64 years, moderate trauma, #1)</i></p>
<p>Psychology</p>	<ul style="list-style-type: none"> <li>- Counselling</li> <li>- Information</li> <li>- Practical coping mechanisms (i.e. gradual exposure techniques, self-compassion)</li> </ul>	<p><i>"I found it really helpful. It was very practical with coping mechanisms and things." (Female, 18 – 44 years, moderate trauma, #3)</i></p> <p><i>"I [had] a video call with them on the [date] and... Which was just absolutely fantastic. Everything said made complete sense to me." (Female, 45 – 64 years, moderate trauma, #1)</i></p>

	<ul style="list-style-type: none"> <li>- Managing anxiety</li> <li>- Check in</li> <li>- Assistance with resuming challenging activities (resuming MOI - driving)</li> </ul>	<p><i>"It was more about me driving again, you know, because that was a fairly big issue... But [they] did help me..." (Female, 65+ years, moderate trauma, #9)</i></p>
Pharmacy	<ul style="list-style-type: none"> <li>- Analgesia</li> <li>- Weaning information</li> </ul>	<p><i>"And the pharmacy for the prescription, they were very good" (Female, 65+ years, moderate trauma, #9)</i></p> <p><i>"... the pharmacist at the surgery rang me up. And asked me how I was taking them. And [they] did say, [they go, 'Yes, I do appreciate that you need them because of the pain that you're in. But you need to start weaning yourself off them'." (Female, 45 – 64 years, major trauma, #2)</i></p>
Trauma team	<ul style="list-style-type: none"> <li>- General information on injury</li> <li>- Follow up appointment (virtual, in-person)</li> <li>- Communicating with other HCPs</li> <li>- Link with psychology services</li> </ul>	<p><i>"I did get a nice phone call from a [person] on the trauma team to see how I was doing and all that. Yeah, I felt like there was an ongoing connection with that, you know." (Male, 65+ years, moderate trauma, #11)</i></p> <p><i>"The trauma team gave me the stick when I saw them at the beginning of [month] and they referred me to local physio and they also sent me [exercises]" (Female, 65+ years, moderate trauma, #9)</i></p>
Community team (district & community nurses)	<ul style="list-style-type: none"> <li>- Changing dressings</li> <li>- Review neck collar</li> </ul>	<p><i>"I had the district nurse was coming in because I had a dress to get changed on my leg, and they come in once a week." (Female, 45 – 64 years, major trauma, #10)</i></p> <p><i>"I had two nurses came in every day to - I say every day. Am I right and saying that? ... Aye, yes, it was every two days and they just checked on my neck." (Female, 65+ years, moderate trauma, #8)</i></p>
Eye clinic	<ul style="list-style-type: none"> <li>- Injury-related eye condition</li> </ul>	<p><i>"I had double vision in my [] eye. Oh, I've still got double vision in my [] eye, so I'm still attending the eye clinic" (Female, 45 – 64 years, major trauma, #10)</i></p>
<p><i>Abbreviation: Cognitive behavioral therapy (CBT), computed tomography scan (CT scan), healthcare professional (HCP) mechanism of injury (MOI), magnetic resonance imaging (MRI)</i></p>		

Table 31 – Private Services Accessed

Private Services Accessed	Purpose	Participant Quotes
Psychology	<ul style="list-style-type: none"> <li>- EMDR therapy</li> <li>- CBT treatment</li> </ul>	<p><i>“So once I’d been discharged, I privately engaged therapists to carry out CBT...” (Male, 45 – 64 years, moderate trauma, #6)</i></p> <p><i>“I am still going to be getting private, um, help. I’m going to be - My insurer will be paying for additional sessions on private help to continue with this [EMDR].” (Female, 45 – 64 years, moderate trauma, #1)</i></p>
Neuro-Linguistic programming therapist	<ul style="list-style-type: none"> <li>- Anxiety with resuming MOI activity</li> </ul>	<p><i>“I met with, an NLP, neuro linguistic programming expert, whose specialism was anxiety, you know, with riding. And so I met with her on a number of occasions to try and overcome the experiences that I was having.” (Female, 45 – 64 years, major trauma, #21)</i></p>
Consultant	<ul style="list-style-type: none"> <li>- Further surgery</li> <li>- Medications</li> <li>- Managing unrelated conditions</li> <li>- Scans</li> </ul>	<p><i>“So when I got discharged from the hospital, I did a lot privately. So I checked myself into a private hospital, [set up] an MRI scan. I couldn’t actually find - even privately - anybody to operate on my [nerve injury] in Scotland. So I went away to (home country) and I had surgery there in [month]” (Male, 45 – 64 years, moderate trauma, #6)</i></p> <p><i>“So I then went away to deal with that [unrelated condition], (laughs) and actually saw a private consultant to get that done quickly and I’m probably now, kind of medication wise, all kind of straight with that.” (Female, 45 – 64 years, major trauma, #21)</i></p> <p><i>“So I ended up having another surgery privately in the December because the first surgery in the NHS hadn’t mended some of the ligaments which had caused the instability.” (Female, 18 – 44 years, moderate trauma, #3)</i></p>

Pilates	<ul style="list-style-type: none"> <li>- 1:1 sessions</li> <li>- Knowledge and advice</li> <li>- Classes</li> </ul>	<p><i>"I started a 1 to 1 recovery program with my pilates teacher... So [they] knew she knew the exercises to give me to sort of start my recovery journey and to get everything working again." (Female, 45 – 64 years, major trauma, #2)</i></p> <p><i>"I think if I hadn't have had the pilates, I think I might really have struggled, especially with my shoulder and neck because all of that was so, so stiff and really difficult to move." (Female, 45 – 64 years, major trauma, #2)</i></p>
Massage	<ul style="list-style-type: none"> <li>- Pain management</li> </ul>	<p><i>"...it was really just related to my how uncomfortable I was. Mainly across my back, my arms, my shoulders. I had massages..." (Male, 65+ years, major trauma, #15)</i></p>
Occupational Therapy	<ul style="list-style-type: none"> <li>- Advice</li> <li>- Equipment</li> </ul>	<p><i>"I mean, the occupational therapist through the insurance, I'm finding [they're] useful because [they're] a very, very nice, chatty [person]. Uh, but [they] keeps kind of wanting to get me stuff and everything..." (Male, 45 – 64 years, major trauma, #19)</i></p> <p><i>"But certainly I've found that the occupational therapists had been very, very helpful. Well, as I said, I got a brand new recliner chair delivered last week, (laughs) which I'm sure the NHS wouldn't do. But the insurance company were happy to do so. But just for giving you ideas of things that you might be more helpful for you, or help you around the house, even if you were financing it yourself or whatever." (Male, 45 – 64 years, major trauma, #19)</i></p>
Physiotherapy	<ul style="list-style-type: none"> <li>- Rehabilitation from private surgery</li> <li>- Progressing strength/mobility</li> </ul>	<p><i>"The physio that I saw in the NHS said they wouldn't then take me because it was a private surgery rather than an NHS surgery. ... so then I went into private physio for most of it." (Female, 18 – 44 years, moderate trauma, #3)</i></p> <p><i>"I'm still doing it [private physiotherapy]. Yeah, I go once a week, um, depending on work and things like that." (Male, 45 – 64 years, moderate trauma, #6)</i></p>
<p><i>Abbreviation: Cognitive behavioral therapy (CBT), Eye movement desensitization and reprocessing (EMDR), mechanism of injury (MOI)</i></p>		

#### 4.6.4.4 HCP Information Provision and Communication During Recovery

This class consists of four categories, relating to participants' experiences of communication and information provision from HCPs. This included aspects such as uncertainty surrounding recovery and rehabilitation, communication and information provision, and sources of information for recovery-related information.

**Category:** Uncertainty about recovery

Some participants experienced some uncertainty surrounding their recovery and rehabilitation information. Some attributed this to a lack information (i.e. completed physiotherapy exercises for eight to nine months as they did not know how long to do them for) or communication (i.e. unable to contact surgeon after surgery).

*“So I just - I've been doing the exercises now for, I say, eight, nine months for my neck and my shoulders. But this while passed, I've just stopped doing them and I feel really good. So I don't know - because I don't know how long I was supposed to do them for.” (Male, 65+ years, major trauma, #12)*

*“after the first surgery, I was kind of being like, 'I'm pretty sure my leg is not meant to move this way.' But no one's replying, so I felt like a little bit crazy.”  
(Female, 18 – 44 years, moderate trauma, #3)*

*“But yeah, you do kind of wonder, like, how long is this going to take? And will I ever do be able to do all the things [again] ...” (Female, 45 – 64 years, major trauma, #21)*

Uncertainty was identified in the systematic review findings as well (Section 2.7.5.1) and was reported to be related to unknowns about the recovery process and how long the injuries would take to heal, as well as uncertainty about the future regarding physical abilities and long-term life plans. The following categories in this section will discuss the aspects of communication and information that led to the participants' uncertainty in this study.

**Category:** Communication with HCPs

Throughout recovery, participants spoke about communication with HCPs, with varied experiences.

Participants spoke about the positive aspects of their communication with HCPs, relating to accessibility to contact HCPs to ask questions about their injury and treatments to date and check in when progressing exercises. Participants also valued when they received understandable explanation of their injury and healing progress, clear communication of their rehabilitation plans, when additional information or resources were offered.

*“I didn't feel that there was nobody that I couldn't phone or get in touch with. I could - if I remember rightly, I could phone right in to the main reception at the ward and speak to somebody and say, 'Look' - you know, anything regarding medication or feeling a bit bit sore on this side of my ribs, anything worry about? There was nothing - I always knew that I could get in touch with my local GP or any of the medics at the hospital. So there was never a there was never a problem.” (Male, 45 – 64 years, moderate trauma, #17)*

*“I found the second one [private surgery] easier. Because I had follow up with - I had contact with my surgeon. So if there was any questions that I had, I was able to ask. But they also - because I was interested, they recorded my surgery, so I got to see exactly what had happened, exactly what they did. They sent me like papers on it and rehab protocols. So I knew what the aim was... ” (Female, 18 – 44 years, moderate trauma, #3)*

Rapport with HCPs was considered to be beneficial as well.

*“I think I was very lucky... Well, I don't know whether it was very lucky because everybody's trained, but certainly the [HCP] that I was assigned to - It clicked. I understood what [they] were saying no problem. [They] explained it, made complete sense to me. And, you know, that was great.” (Female, 45 – 64 years, moderate trauma, #1)*

Participants also reported experiencing challenges around communication, such as when there was a lack of communication or receiving mixed information.

*“I had a really tough time getting hold of my surgeon. ... They sent me for another scan. ... But then I got no feedback and no response for three months.” (Female, 18 – 44 years, moderate trauma, #3)*

*“I was a bit disappointed with that, to be honest. I was getting quite a lot of mixed information and mixed communications. It was a bit - I felt a bit like one person*

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*was telling you one thing and the other person was telling you the other. ... I thought in the [date], the brace would be coming off. That's what I was led to believe. So when you go in and you get your CT scan and then they were told, 'No, you're just in for a CT scan'. It kind of made me a bit, that kind of got me a bit down because in my head, I thought it was coming off. And it turned out to be in like another six weeks before it came off. But, as I said, it was just the communication side was a bit disappointing, to be honest." (Male, 18 – 44 years, major trauma, #13)*

Participants also spoke about how communication between HCPs in different settings affected their care. One participant attended a specialist rehabilitation service and spoke about how information on their current condition was not shared with their primary care providers, as they were contacted for an unrelated appointment and the primary care providers were not aware of their mobility status. Another participant reported that the trauma team relayed the information to their local HCPs, but there was an ongoing misunderstanding of their injuries.

*"I mean, as far as I'm aware, (regional hospital) have told them [local HCPs] all of what happened. So whether it's just they can't be bothered reading up the notes or I don't know. ... But they don't quite seem to understand [their injuries]. So I don't know if there's maybe... Yeah, I don't know. As I say, I know (regional hospital) have told them, they've got full notes on what happened, but not quite sure if they fully understand, the depth of it." (Female, 18 – 44 years, major trauma, #18)*

One participant mentioned several suggestions that would have improved communication, including providing written information and keeping the same consultant where possible.

*"Probably like written information and if possible, to keep the same consultant or doctor. ... But obviously that's is obviously an ideal world, but at least if you're with the same person and obviously know your case, they know you - but that doesn't always happen, you know what I mean? But would be the two things I would say would have helped." (Male, 18 – 44 years, major trauma, #13)*

Participants reported varied experiences with communication with HCPs. Participants in this study identified positive attributes of communication with HCPs to include: accessibility for asking questions, providing understandable explanation of the injury and healing progress, providing clear communication of their rehabilitation plans, when additional information or resources were offered.



This values were also identified in the systematic review in Chapter 2 (Section 2.7.5.4), highlighting the positive communication aspects such as engaging with patient, use of simple language, and explaining reasoning for medical decisions (Braaf et al. 2018). These findings suggest that communication is an important consideration for all HCPs that provide care to patients with traumatic injuries and indicate the importance of considering health literacy and person-centred care (see Section 4.7).

Communication challenges such as the lack of information or receiving mixed information were identified in this study. This finding was similar to the synthesised findings #4 in the systematic review (Section 2.7.5.4), where participants reported a lack of contact and information after leaving the hospital, as well as receiving conflicting and fragmented information that negatively impacted on their ability to understand and manage their condition (Braaf et al. 2018). This findings also indicates the importance of person-centred care to best support these individuals, as discussed further in Section 4.7.

Participants in this study also identified times where a lack of communication between HCPs impacted on their care. This has been recognised in other research as well, where a lack of communication was seen to impact on continuity of care and patients' experiences (Kellezi et al. 2015; Gotlib Conn et al. 2018; Kettlewell et al. 2021; Olive et al. 2022). Due to the number of different services that participants reported accessing throughout recovery, this demonstrates the challenge of delivering coordinated, person-centred care for the traumatic injury population, as rehabilitation needs vary greatly by individual and throughout the recovery process. Participants in this study spoke about how the trauma service was useful for liaising between HCPs, but further consideration on how local services can continue to improve collaboration would be beneficial.

**Category:** Sources of information

Participants spoke about seeking out information from multiple sources throughout their recovery (see Table 32). Sources included a range of HCPs, self-research performed by the participant and in one case, a participant's partner who worked as an HCP. The information participants sought out was recovery-related, ranging from general information to information on specific injuries.

**Table 32 – Sources and Types of Information**

Information Sources	Type of Information	Participant Quotes
Medical input	<ul style="list-style-type: none"> <li>- Explained scans</li> <li>- Expectations of symptoms</li> <li>- Prognosis on injury recovery</li> <li>- Return to work information</li> <li>- Answer questions, reassurance</li> <li>- Information on neurological symptoms</li> <li>- Weightbearing status</li> <li>- Pain management/medications</li> </ul>	<p><i>“So [they] said that, with my kind of injury, 18 months to two years after the event, whatever pain you're in at that point will be the pain level that you're probably pretty much have to deal with. So I'm okay with that, because now I know - you know, I think I was always a bit frustrated that I wasn't getting better, but now I know I just have to put up with it. And I think something changes in your head when you know that. So I'm okay.” (Female, 45 – 64 years, major trauma, #20)</i></p> <p><i>“[They were] very helpful. And [they] would actually show you the X-rays on your computer and show you like, “Obviously this part shouldn't be here. That's why you've had this operation. And every time you come in, it should get less, like the gap' - I think it was a gap between some of my bits of my knee and [they] were explaining it. So that was quite good. It gives you a bit more of an understanding.” (Male, 18 – 44 years, major trauma, #13)</i></p>
Physiotherapy	<ul style="list-style-type: none"> <li>- Explained injuries</li> <li>- Advise on weight-bearing status</li> <li>- Recovery-related information</li> <li>- Timeline for use of mobility aids</li> <li>- Sling use, positioning</li> <li>- Movements and exercises</li> </ul>	<p><i>“The physio input that I received was really useful. Because they explained some of the injuries, which I didn't get a lot of in hospital. And so I found that really handy and put my mind at rest.” (Female, 18 – 44 years, moderate trauma, #3)</i></p> <p><i>“And they [physiotherapists] - all throughout everyone had explained to me about wearing the string, the sling and how best to hold yourself, and if you were able to cough or anything to, you know, take a towel. They all provided very useful, helpful advice - towel around myself to, to pull myself in together, which would keep everything, but also encourage me to try and move my arms” (Female, 45 – 64 years, moderate trauma, #1)</i></p>
Pharmacy	<ul style="list-style-type: none"> <li>- Weaning off analgesia</li> </ul>	<p><i>“And actually, the pharmacist at the surgery rang me up. And asked me how I was taking them. And she did say, she goes, 'Yes, I do appreciate that you need them because of the pain that you're in. But you need to start weaning yourself off them'.” (Female, 45 – 64 years, major trauma, #2)</i></p>

Psychology	<ul style="list-style-type: none"> <li>- Information</li> <li>- Techniques</li> <li>- Practical coping strategies</li> </ul>	<p><i>"[They] explained to me to - Explained the logic side of your brain. Fast brain/Slow brain theory." (Female, 45 – 64 years, moderate trauma, #1)</i></p> <p><i>"I found it really helpful. It was very practical with coping mechanisms and things." (Female, 18 – 44 years, moderate trauma, #3)</i></p>
Private Occupational Therapy	<ul style="list-style-type: none"> <li>- Advice for managing in home environment</li> <li>- Recommendations for equipment</li> <li>- Referred to other HCP</li> </ul>	<p><i>"I would say the, although it came through the [private] occupational therapist, I think a bit more attention on your... what your lifestyle is going to be like and diet and all that kind of stuff." (Male, 45 – 64 years, major trauma, #19)</i></p>
Pilates instructor	<ul style="list-style-type: none"> <li>- Early recovery information</li> </ul>	<p><i>"I started a 1 to 1 recovery program with my pilates teacher ... [they] knew the exercises to give me to sort of start my recovery journey and to get everything working again." (Female, 45 – 64 years, major trauma, #2)</i></p>
Partner	<ul style="list-style-type: none"> <li>- General recovery information</li> </ul>	<p><i>"Only from my [partner], really. But that would have come otherwise, I guess. [They] were doing what they [HCPs] would have done." (Male, 65+ years, moderate trauma, #11)</i></p>
Self	<ul style="list-style-type: none"> <li>- Researched rehabilitation exercise videos</li> <li>- Weaning off analgesia</li> </ul>	<p><i>"I think when I struggled without it [analgesia], I started to read up about that and, you know, sort of in how I should come off or how you could become addicted. Because I couldn't understand how I was feeling, you know, it was just like, ooh, really... Yeah, I think I did that myself, actually." (Female, 45 – 64 years, major trauma, #21)</i></p> <p><i>"That [hand exercises] was just something that I found on my own. I mean, the consultants at the fracture clinic, [they] just sort of said to me to get to touch my fingers with my thumb, you know, just to keep getting all that moving again." (Female, 45 – 64 years, major trauma, #2)</i></p>

The sources of information participants reported to receive information from was similar to those identified in the qualitative systematic review in Chapter 2 (i.e. GPs, physiotherapists, surgeons/medical specialists, injury insurers) (Section 2.7.5.4). The systematic review also identified that patients sought out information to cope with the uncertainties they faced, and recovery from traumatic injuries can involve many different aspects (e.g. physical, functional, psychological), requiring information from HCPs from different specialities.

**Category:** Information provision during recovery

Experiences of information provision and perspectives on the information received varied. Participants reported seeking out information from HCPs, regarding when they would be able to resume activities or how hard they would be able to push themselves in rehabilitation. Some participants reported receiving adequate information about their rehabilitation and recovery when leaving hospital and at the subsequent follow ups. The sources and topics of information discussed in the interviews are provided in Table 32.

*“I ended up with the hand fracture clinic. They ended up sort of giving me an awful lot of information and actually ended up getting x-rayed for the for the other fractures as well. Just as a follow up by that team.” (Female, 45 – 64 years, major trauma, #2)*

There were different perspectives on the amount of information about expectations for recovery. Some participants reported they were provided with adequate timelines for their recovery, symptoms, and return to work. Others reported that they had not received adequate information on the timelines of recovery of their physical injuries or functional ability.

*“... in the hospital, the trauma team who came to visit ... they said, you know, 'You'll be off work for about eight weeks, 8 to 10 weeks' and I went 'Me? No! Not at all. Can't take that long.' You know, I just didn't believe it. ... [They] had prepared me, kind of. I was shocked at first, but they had prepared me and said that” (Female, 45 – 64 years, moderate trauma, #1)*

*“I can't remember having like a conversation where they said how far... my mobility would return to or anything like that, I don't think.” (Male, 45 – 64 years, moderate trauma, #14)*

Participants also expressed challenges with the information provision, mainly regarding a perceived lack of information or receiving variable information. Participants reported not being provided with information when leaving the hospital, both injury-related as well as regarding general health information (i.e. smoking, lifestyle, diet, habits). One participant reported that a serious diagnosis was included on their discharge letter that they were not made aware of before discharge, which “caused [them] quite a lot of grief” (Female, 65+ years, moderate trauma, #9). Participants also reported receiving variable or at times, conflicting, information at follow ups.

*“I don't think anybody ever mentioned to me about recovery, the connection with smoking or anything like that while I was in hospital. So I think a bit more attention on, kind of your health, your lifestyle ... during recovery, not just physically, but, you know, kind of diet, your bad habits, that kind of thing and everything is something that maybe could have been more enhanced.” (Male, 45 – 64 years, major trauma, #19)*

*“And the follow ups, they were good in terms of explaining things with my [lower limb injury]. With my [upper limb injury], it was a little bit less clear. And a lot of it depended on who I saw in clinic that day. So if I saw somebody for my [lower limb injury], I wouldn't always get them the best information about my [upper limb injury]. But again, if I saw someone about my [upper limb injury], they wouldn't always have the answers to what was happening with my [lower limb injury].” (Female, 18 – 44 years, moderate trauma, #3)*

The format of the information received was important. One challenge reported was receiving mainly verbal information, which was challenging to retain due to their current condition. One participant reported that they had their partner attend appointments with them, finding it handy to have “two yous getting information” (Male, 18 – 44 years, major trauma, #13). Another participant reported that they received an exercise sheet that looking like it was ‘found in a bottom drawer’ and looked ‘a wee bit grubby’, so they made themselves a cleaner copy to use throughout their recovery.

*“... it was mostly verbal. The only thing, like paper or stuff was the appointments. You know, I mean, everything else was just verbal.” (Male, 18 – 44 years, major trauma, #13)*

Some participants suggested that having written information would have been useful. One participant mentioned that they would have appreciated a summary of their injuries when they left the hospital that outlined the events starting from the injury, through the time in hospital with a list

of injuries sustained, interventions completed, as well as a long-term prognosis would improve their ability to self-manage their recovery.

*“... when you got released, if it was almost like a little timeline for you of like, this is when your injury happened, these are the scans that we did, this is what your injuries are. ... So, being able to have just a sheet of paper that said everything would be really helpful” (Female, 18 – 44 years, moderate trauma, #3)*

*“I think that [information summary on discharge] adds to your sense of autonomy because you don't know what your injuries are and then you leave hospital and people are like, 'So what have you done?' And you're like, 'I don't know. But I can't walk, my arms sore, and I can't sit up in bed without crying. I don't know what's wrong'. And it feels quite like things have been done to you rather than this whole person-centered care [idea]” (Female, 18 – 44 years, moderate trauma, #3)*

*“And I scribbled down all these little notes [during follow up appointments] and I would read them, not every day, but I would read them and then they'd just go back into your mind and, you know, you can implement it easier. Reading it once or just having someone speak to you is not enough. It's good to have it written down.” (Female, 45 – 64 years, moderate trauma, #1)*

Others acknowledged that timing of receiving information was important, as leaving hospital was a busy time when the patient was mentally and physically tired.

*“I think if you get too much [information] it can be overload for some people ... there's a lot going on and if you get too much it's 'oh goodness'. Because physically... mental - physically you're tired, but mentally you're tired as well.”  
(Female, 45 – 64 years, moderate trauma, #1)*

These findings demonstrate that there was a wide variety of experiences relating to information provision. Some participants reported receiving adequate information on their rehabilitation and recovery and described positive communication experiences with HCPs.

Others reported there was a lack of information, which included injury and recovery-related information as well as general health promotion information. The initial time right after leaving hospital was identified as a key time when participants reported they did not receive adequate information regarding the recovery timeline for their physical injuries and functional ability. This was found in the study by Finstad et al., where all participants identified a lack of information regarding

their injury and prognosis on physical function recovery and psychological challenges related to the event (2021). This indicates that there is currently an unmet need for information in the early stages of recovery.

The majority of literature on information provision for traumatic injury populations is focused on information provided at the time of discharge from hospital (Christie et al. 2016; Kimmel et al. 2016; Gotlib Conn et al. 2018; Collins et al. 2022; Olive et al. 2022). Information provision is recognised to be important for discharge planning in the time before leaving hospital, and Collins et al. identified that aspects such as relevancy, format and delivery, timing, and amount of information should be considered (2022). Information provision should also consider the needs of family/carers, as support from immediate family has been identified as an important part of recovery (Olive et al. 2022).

Participants reported most information was given verbally in this study, when some suggested that written information would be beneficial. The idea of a written discharge summary was suggested, as some participants described that they did not have a full understanding of their injuries and what interventions and tests had been completed. The use of a 'patient-oriented care summary' is mentioned in the literature, as patients report that having 'patient-oriented conversations' felt more prepared for hospital discharge (Gotlib Conn et al. 2018). The format and content of a written discharge summary would benefit from further research, possibly using a co-production research method to incorporate patients' perspectives.

Other studies have identified possible barriers to information provision for patients included health literacy and timing of providing information. Health literacy is defined as "the ability of individuals to gain access to, understand and use information in ways which promote and maintain good health" (World Health Organization 2024 para. 1), which can impact on individuals' ability to understand and comply with advice given (Collins et al. 2022). The timing and format of giving information was identified to be important, as at hospital discharge, patients with traumatic injuries can face barriers such as cognitive impairment, use of analgesia, and stress that impact on retention of information (Kimmel et al. 2016; Gotlib Conn et al. 2018). Aspects such as context, format, and timing should be considered when developing a patient-focused discharge summary.

## 4.7 Implications of Findings for Clinical Practice

In conjunction with the themes discussed in Section 4.6, overarching concepts from the participants' recovery experiences were identified that had direct implications for clinical practice.

This study highlighted the need for personalised care and a person-centred approach for rehabilitation for adults with traumatic injuries. Traumatic injuries can be considered chronic medical conditions, due to the long-term impact of the injuries on many aspects of individuals' lives (Gabbe et al. 2017; James et al. 2022). Each participants' recovery journey was unique and identified different needs at different timepoints throughout recovery. This has been identified in the literature, with Norris et al. highlighting the non-linear aspect of the recovery process (Norris et al. 2023), Claydon et al. describing recovery as "a journey through repair and rehabilitation to recovery" that was not always straightforward (Claydon, Robinson and Aldridge 2017 p. 326), and Richmond et al. describing recovery in three themes; the event, the proceeding fallout, and the process of moving on (2000).

The findings from this study identified that participants accessed a wide range of services in the several years post-injury, including NHS, private, as well as from other sources. Collaborative approaches to providing care have an important role in the recovery process, as identified by Norris et al.: "The complexity of individual needs cannot realistically be met by one profession alone – at any stage of the patient journey" (2023 p. 7). Participants valued having the trauma service as a single point of contact for information and assistance after leaving the hospital, but as participants needs varied, the strength of the trauma team was their connection and collaboration with local services.

The findings from this study also highlighted that there are many opportunities to incorporate supported self-management into care throughout the recovery journey for patients in the North of Scotland. Participants spoke about their recovery using pragmatic language and reported pragmatic approaches to managing their rehabilitation and recovery. Participants appreciate the follow up that is currently provided by the NoS MTN and the long-term psychological support is an opportunity to continue to promote PTG throughout recovery. The importance of tracking progress and use of physical and functional ability milestones throughout recovery was identified by participants in this study. Healthcare professionals can signpost patients to methods of measuring their overall recovery progress, as this may help patients cope with experiencing variable symptoms and ability from day to day. Providing information to help manage patients' expectations for recovery is also beneficial. Participants were interested to know more about their injuries and the recovery process, so there are multiple opportunities throughout recovery to provide patients with information. Information



and communication were often discussed together, with lack of information and communication after leaving the hospital contributed to uncertainty in the recovery process. When providing information, health literacy, timing, and effective communication techniques should be considered.

## 4.8 Strengths and Limitations

### 4.8.1 Limitations

Several limitations were identified and the impact these had on the study are detailed here. The first limitation to consider relates to the participant population. The sample population was not ethnically diverse, with 90.5% reporting 'White: Scottish' or 'White: Other British', but this is similar to the population of Scotland, with 96% of Scotland's population reporting the ethnicity of 'White: Scottish' or 'White: Other British' in the 2011 national census (National Records of Scotland 2023). Most of the participants reported residing in areas that are listed in the top half of the SIMD index, meaning that these findings may not be directly generalisable to the wider traumatic injury population, as patients that live in different locations (i.e. areas with higher levels of deprivation) may have different experiences. Future studies could consider ways to actively encourage participants from underrepresented groups to participate in research, such as use of public and patient involvement (PPI) (Turk, Boylan and Locock 2016).

The sample population also reported residing within the NHS Grampian borders, so the findings of this study are not directly generalisable to other areas of Scotland. These limitations to the sample population should be considered when considering the applicability of the findings to other traumatic injury populations in Scotland or the UK. This study did capture a wide range of ages from 20 to 82 years of age and near equal number of males and females, and moderate and major traumatic injuries, so this study did capture variation in the aspects that were considered in recruitment.

Another challenge that was considered was recall bias, due to the interviews only being conducted at one timepoint one to two years post-injury. Recall bias refers to when participants' "erroneously provide responses that depend on his/her ability to recall past event[s]" (Althubaiti 2016 p. 213). This is a challenge for research that asks participants to recall information retrospectively, but this study attempted to address this by using a timeline approach, which has been identified to help with recalling details from past events (Hope, Mullis and Gabbert 2013), and sending out the timeline template ahead of time to give participants time to prepare. One way that this could be addressed in future research is to employ a longitudinal study design to ask participants at multiple timepoints post-injury, but as this research was exploratory, the cross-sectional time horizon was a suitable choice. A strength of longitudinal studies is their use in studying change and development, but with

the drawbacks of being costly and pose an increased burden on participants (Teague et al. 2018; Saunders, Lewis and Thornhill 2023).

Another limitation that this study had was that the demographic information was self-reported. The researcher observed that some participants were not able to recall or describe fully the injuries they had sustained. This was possibly due to poor recall as the interviews were conducted one to two years post-injury, but participants also described that they weren't told all their injuries when leaving hospital, further justifying the need for a review of the current information provision to patients on hospital discharge. An unpublished service evaluation conducted by the NoS MTN identified that patients did not always know the names of the services they accessed (Wagner, E., personal communication by conversation. 24 March 2022). Bearing in mind that patients may not remember exactly what services they accessed, the accuracy of the information provided for the self-reported injuries sustained (Table 28) as well as the services accessed in Section 4.6.4.3 should be considered.

The impact of self-selection bias was considered, as this research used an opt-in recruitment method to comply with ethical principles. Self-selection bias, similar to the non-response bias, refers to when "individuals who consent to be involved in interviews may be different to those who do not" (Robinson 2014 p. 35). One way this could have impacted on this research is that more individuals that considered themselves fully recovered and happy with their recovery could have reached out to participate to share their positive experiences. Conversely, it is also possible that participants that had poor experiences would be inclined to share their experiences as well. Both positive and negative experiences were shared throughout the interviews and there was a range of perspectives where some participants perceived their recovery to be complete, whereas others saw themselves still recovering at the time of the interview. As this study used a non-probability sampling strategy, the aim was not to have a representative sample, but this should be considered when considering the implications of the findings.

#### 4.8.2 Strengths

The main strengths of the research relate to the applied nature and the relevance to the trauma service and non-neurological traumatic injury population in the North of Scotland. This research was informed by a clear gap in the current knowledge that was of clinical relevance to the local trauma service. The topic of the thesis and the primary research were developed in collaboration with the NoS MTN clinicians and had guidance from clinical and academic experts in the supervisory team. This research is directly relevant to the NoS MTN as the research aims were to explore participants and provide a report to the NoS MTN to inform local practice. As the participants were all residing in

the NHS Grampian borders, the research findings and recommendations are directly relevant to the non-neurological traumatic injury population in the Grampian area.

Another strength was the recruitment strategy and the addition of the recruitment sampling framework. By only recruiting participants from the NoS MTC *Rehabilitation Plan Database* meant that all eligible participants had the relevant experiences with receiving care from the NoS MTN, whereas other recruitment methods considered (e.g. social media, local charities) may not have been as specific and would have been challenging to ensure the included participants had the relevant experiences. The addition of the sampling framework added rigour to the recruitment strategy as it enabled the use of maximum variation sampling to capture a wide range of perspectives and experiences, based on age and gender. In addition, participants had a wide range of different types of injuries (as seen in Table 28). This variation in injury types was a strength as it means this research was able to capture perspectives of people that had different combinations of injury types and their experiences of recovery, making the research findings relevant to a wide range of individuals with moderate and major non-neurological traumatic injuries.

Another strength of this research was that it was developed with a solid philosophical and methodological base using a pragmatic philosophy and Interpretive Description approach, with reflexive practice undertaken throughout the thesis. The rigorous approach used for this applied research enhanced the quality of the research and the findings, therefore this research can be used to inform future research and clinical practice in this field. In addition, the study was underpinned by the biopsychosocial model, which considers the biological, psychological and social dimensions of illness and is widely accepted in healthcare settings (Borrell-Carrió, Suchman and Epstein 2004; Havelka, Luanin and Luanin 2009). Based on the biopsychosocial model, the ICF framework influenced the development of the research and provided a lens for data analysis as a holistic approach to consider the relationship of functioning and disability, in the context of the participants' recovery experiences. Use of the ICF was a strength for this study because it is versatile and because it is used clinically, the findings will be relatable to those working in clinical practice.

#### **4.9 Reflexive Practice in Action**

Throughout this thesis, I maintained a research journal and completed the reflexivity activities. These have helped guide the research process from data analysis, data management and analysis, through to displaying the findings in the following section. This section is briefly discussing the impact of the reflexive activities on the research.

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I found completing the narrative autobiography and self-interview prior to interview helpful, as it helped me assess my current understanding and preconceptions about the topic. It also helped me identify the areas of the research topic where I was more familiar (e.g. physiotherapy-related topics), but also highlight areas that I was not as familiar with, such as psychological services and proactively brainstorm ideas to use for prompts for those topics during the interviews.

Completing the field notes after each interview was useful as a way to self-debrief and assess what went well and also how I could improve different aspects in the next interview. This also proved to be a useful way to check ongoing sample adequacy throughout the data collection process. This was done by creating a list of the topics brought up in interviews in the field notes and used these lists to track when novel experiences or perspectives were identified and continuously assessing the amount and quality of data collected.

Reflecting on the use virtual interviews, I believe they were well-accepted by participants and provided an inclusive option and was the least burden on participants, as no travel time or costs were required to participate in the research. All participants were given the option of having the interview on MS Teams or telephone and there was a mix of both options used. It was considered in the development of the study whether to offer in-person interviews, but all participants were happy with either the telephone or MS Teams call, but arrangements for face-to-face interviews were considered if necessary. It was useful to have the telephone call as a back-up method, as there were several instances where there were issues with MS Teams connectivity. The use of virtual interviews was well-accepted and possibly could have positively contributed to the success of completing all interviews that had been scheduled.

Throughout the study, I considered my role as the researcher and what impact I had on the research. During data collection, I believe that participants felt comfortable and open to sharing experiences because multiple participants shared both positive feedback and expressed challenges they experienced relating to general experiences, to the care they received, and services they accessed. I observed that I felt most comfortable prompting on topics such as physical limitations, return to activities, and use of rehabilitation services, as these are topics that I am familiar with from clinical practice as a physiotherapist. Other areas that I was less familiar with, such as management of psychological challenges and support available, were more challenging for me to prompt on, possibly impacting on the depth of the data in those areas.

Regular meetings with the supervisory team were conducted throughout this project, at which topics relating to the systematic review and primary research were discussed. The supervisory team included both clinical and academic experts and this positively impacted on the quality and relevancy

of the systematic review and also the primary study, as the supervisory team was able to provide guidance and ensured that the study maintained a high standard of methodological rigour while also continuously considering the applied relevance to clinical practice.

Throughout this project, I reflected on the use of the pragmatic worldview and considered the impact this had on the project. I believe that using a pragmatic philosophy was beneficial for this research project as it fit with the use of Interpretive Description approach and qualitative methods to explore the research aims, while maintaining the 'value-driven' axiological approach that allowed for the rigorous exploration of the qualitative data while staying grounded in the applied aims.

In addition to maintaining research rigor, the reflexive practice was useful personally, both for my clinical and my academic roles. Clinically, conducting this research has improved my ability to communicate and empathise with patients and highlighted the importance of person-centred care. Now when working clinically, as I am aware that numerous factors influence patients' recovery experiences, regardless of their presenting condition. I also have a better understanding of the importance of providing accessible information and communication, as hearing the different experiences from participants caused me to reflect on my own practice and improve how I approach communicating with patients in my physiotherapy role.

As a researcher, I am interested to try other less-used qualitative or action research methods, such as group concept mapping, photo-story activities, or co-production research, as these could engage participants in novel ways that could provide unique perspectives on different health-related topics. For this research topic, if I was to complete a similar study, I would be interested in getting feedback from a PPI group on how best to incorporate the timeline approach in the research design, with some possible examples of using different software that encourages the interactive aspect of the timeline creation more or adding in an activity of participants creating their ideal recovery journey regarding aspects such as care and information provision to compare with their real recovery journey.

#### **4.10 Summary**

This chapter starts by detailing the data collection and analysis process, then presented participant demographics, indicating participants varied in terms of age, injury severity, and injury types. The qualitative findings were then presented and discussed in the context of the current literature. Three themes were identified from the qualitative data: 1) *Management of physical impairments and psychological challenges throughout recovery*, 2) *Recovery, rehabilitation, and participation*

*experiences*, and 3) *Support, services, and wider impact of injury throughout recovery*. The implications of the qualitative findings on clinical practice were then discussed, followed by the strengths and limitations of the research. A reflection of the reflexive activities carried out throughout the research was discussed. In the final chapter, the findings of this thesis are summarised and recommendations for clinical practice and future research are discussed.

## CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

### 5.1 Introduction

The previous chapter discussed the participant demographics and qualitative findings from the primary research. This final chapter concludes the thesis by summarising the findings from the systematic review and research study and provides recommendations for clinical practice and future research. The recommendations for clinical practice are categorised by topic of interest (i.e. valued practices, recommended information provision, considerations for HCPs, and areas of collaboration) and the future areas of research are identified, with the priorities for the local trauma service identified.

### 5.2 Conclusion

The aim of this thesis was to better understand the experiences of adults with major and traumatic injuries after leaving hospital. In the first chapter, the background of management individuals with traumatic injuries was discussed, with the implementation of trauma networks and improvements in pre-hospital and acute care reduced mortality in the traumatic injury population. Following these improvements, the focus has shifted to what happens to patients after they leave the hospital and the importance of understanding the recovery experiences and long-term outcomes of these individuals. Following the launch of the NoS MTN in 2018, a lack of knowledge was identified around what happens to individuals with traumatic injuries after they leave the hospital in Scotland.

A qualitative systematic review was conducted and presented in Chapter 2 exploring the existing qualitative evidence surrounding the recovery experiences of adults with traumatic injuries. This review included thirteen reports and identified four synthesised findings: 1) *Recovery experiences are highly individual and influenced by a range of intrapersonal factors*, 2) *Enduring physical and psychological consequences impact on recovery experiences following traumatic injuries*, 3) *Adults recovering from major and moderate traumatic injuries access a range of health and care services, as well as social support, during recovery*, and 4) *Patient – healthcare professional communication and information provision are valued by adults recovering from major and moderate traumatic injuries*. Along with recommendations for clinical practice, this systematic review also identified a lack of qualitative evidence on the experiences of the traumatic injury population in Scotland, demonstrating the need for further primary research in this context.

Following on from the findings of the systematic review, the research study presented in Chapter 3 and 4 was conducted, with the aim to explore the recovery experiences of adults with major and moderate traumatic injuries in the North of Scotland. To the researcher's knowledge, this is the first study to explore recovery experiences of adults with traumatic injuries in Scotland. This research identified three themes: 1) *Management of physical impairments and psychological challenges throughout recovery*, 2) *Recovery, rehabilitation, and participation experiences*, and 3) *Support, services, and wider impact of injury throughout recovery*. These themes were developed using the ICF framework to describe the wide range of topic areas covered in the interview and how recovery experiences related to multiple ICF domains. This study also identified the importance of personalised care throughout patients' recovery journeys and indicate there are many opportunities for HCPs to incorporate strategies for personalised care at all stages of recovery (Section 4.7).

This research has generated new knowledge of the recovery experiences of adults with traumatic injuries in the Scottish context. This information is important because it can be used to inform the local trauma service of patients' experiences, as well as adding to the literature on the recovery experiences of adults with traumatic injuries after leaving hospital. This research identified positive feedback from participants where the trauma team and local services are providing ideal care, as well as areas of practice to review and areas than require further research. The findings of this study indicate that adults with traumatic injuries experience individualised recovery journeys and there is a need for personalised care approach to meet those needs. As the NoS MTN continues to develop, the findings of this research can be used to inform how the trauma service can continue to "Give life back" to individuals following a traumatic injury.

### **5.3 Recommendations for Clinical Practice**

From the qualitative findings, a number of recommendations for clinical practice were identified. These recommendations are presented in four different categories relating to 1) patient valued practices, 2) areas for collaboration, 3) recommended information provision, and 4) wider considerations for HCPs, and discuss the relevancy to local, national, and international clinical practice.



### 5.3.1 Patient Valued Practices

Participants reported appreciating the role of the trauma team and benefitted from access to local services throughout recovery. It is recommended that the local trauma service (i.e. NoS MTN) continues to provide these aspects of care to future patients:

- Participants valued accessibility of trauma service, including provided contact information and resources following hospital discharge.
- Participants appreciated the follow up phone call shortly after discharge and the follow up after hospital discharge.
- Long-term access to psychological services was valued and should be maintained. Participants appreciated receiving the psychology follow up letters, even if they did not utilise the service at the time.
- Participants valued aspects of both virtual and in-person follow ups, when used with a person-centred approach.

### 5.3.2 Areas for Collaboration

Participants also discussed opportunities for the local trauma service (i.e. NoS MTN) to collaborate with other local services in the North of Scotland to improve patient experiences and outcomes. These were spoken about as an addition to what services were already provided by the trauma service and local services.

- The trauma service could consider collaboration with pharmacy services for post-discharge information on weaning off opioids and access to analgesia when away from local area.
- The trauma service could consider collaboration or ongoing 'link' with physiotherapy for long-term follow up for patients with ongoing issues (e.g. mobility, usual activities, and pain/discomfort).
- The trauma service could consider collaboration with physiotherapy or local gyms for higher-level rehabilitation classes/gym sessions with advice from qualified staff for improving long-term outcomes.

### 5.3.3 Recommended Information Provision

While participants' perspectives on information provision were varied, the following topics were identified as areas where further information would have been beneficial to participants and their

family/carers. These recommendations are relevant at a local level to the NoS MTN service, but also at the national level, as other trauma networks within the STN could consider whether the following information is being provided to current patients.

- The trauma team should provide accessible written summary of injuries and timeline of interventions conducted in hospital at discharge from hospital.
- The trauma team should provide recovery-related information, including:
  - ~ Expectations for recovery (i.e. timeline of injury healing, rehabilitation, injury prognosis)
  - ~ Self-management techniques (i.e. coping strategies for managing setbacks, methods for tracking progress – *AfterTrauma Recovery* app, diary)
  - ~ Supported self-management resources for pain management (i.e. information for pharmacological, non-pharmacological strategies, and weaning plan for opioids)
  - ~ Resources for enabling independence with ADLs early in recovery (e.g. aids, OT tricks/tools, one handed ADLs advice)
  - ~ Dietary recommendations for nutritional support throughout recovery
- The trauma team should signpost resources for patient and family/carer, where appropriate, for:
  - ~ Return to work/vocational support resources
  - ~ Resources for carers (e.g. *Support for unpaid carers* information, *Carers Scotland charity*)
  - ~ Financial support resources
- The trauma team should update handouts (i.e. exercise sheets) regularly for presentability.

#### 5.3.4 Wider Considerations for Healthcare Professionals

From the systematic review in Chapter 2 and the qualitative findings in Chapter 4, a number of considerations were identified to be relevant in national and international contexts. While the transferability of qualitative findings requires the reader to critically assess the relevancy of findings to their specific context, the following considerations were identified in both the primary research conducted locally in the North of Scotland and in the international literature.

When providing care for patients with traumatic injuries, healthcare professionals should consider:

- The importance of information and communication throughout recovery to optimise personal autonomy and self-management (e.g. written vs verbal information provision, health literacy, consistent information).
- Patient-preference for the use of virtual and in-person services.
- The impact that enduring physical and psychological consequences have on physical, psychological, and occupational aspects of individuals' lives and consider ways to address these when providing care throughout recovery (i.e. resuming mechanism of injury activity, return to work).
- That recovery experiences are individual and influenced by many intrapersonal and extra-personal factors (i.e. perception of age impact on recovery, recovery in relation to other life events).

The top recommendation for the NoS MTN is to enhance information provision. Participants reported mixed experiences with information provision, as some reported receiving adequate information at the right time, but others reported this as a challenge during their recovery and is an area that would benefit from review within the NoS MTN. Aspects identified in this research are discharge summaries for participants and providing recovery-related information in written format. The creation of a patient-focused discharge summary warrant additional research or a quality improvement project to determine the optimal content, delivery format, and timing. Signposting of relevant resources for patients as well as family/carers was also mentioned and local resources on various topics (i.e. vocational support, resources for carers, financial support) should be compiled and offered at appropriate times throughout recovery.

#### **5.4 Recommendations for Future Research**

The findings from this research identified areas that require further research:

- Co-production research on the best format and content for a patient-focused discharge summary, investigating what information to include, ensuring comprehensibility, considering health literacy, and timing of information delivery
- Exploring accessibility of rehabilitation services throughout the North of Scotland
- Evaluating the parameters of current rehabilitation interventions and impact on patient outcomes (i.e. HRQoL)

- Exploring the use of digital technology such as *AfterTrauma Recovery* app or similar progress-tracking app and impact on patient outcomes (i.e. HRQoL)
- Developing a trauma registry for research purposes to enable future research and service evaluations
- Consensus work to consider extension of STAG PROM data collection to capture longitudinal data (i.e. longer than one year post-injury)
- Qualitative research:
  - ~ Exploring family/carers' experiences and needs when supporting patient following traumatic injury
  - ~ Explore aspects of supported self-management following traumatic injury and what is needed for successful supported self-management
- Establishment of a PPI Group for the North of Scotland Trauma Network for improving future research and quality improvement projects

The top priorities for research in the North of Scotland is around information provision and accessibility of services. Information provision at hospital discharge was identified as an area that could be improved and further research on a patient-focused discharge summary adopt a co-production research design to have the decisions on content, format, and timing informed by the perspectives of adults with traumatic injuries. The accessibility of rehabilitation services would be another area relevant to the North of Scotland as this research identified that participants engaged in a wider range of rehabilitation services, while some reported not having access to any rehabilitation services after leaving hospital.

## 5.5 Summary

This final chapter summarised the findings of this thesis, which have added to the existing knowledge about the recovery experiences of adults with non-neurological traumatic injuries by synthesising the existing evidence in the literature, as well as providing novel knowledge of the recovery experiences of adults with traumatic injuries in the North of Scotland. This knowledge has been used to develop recommendations to inform the local trauma service of current practice that is valued, areas of improvement, and future research.

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## REFERENCES

- ABHILASH, K.P.P. and SIVANANDAN, A., 2020. Early Management of Trauma: The Golden Hour. *Current Medical Issues*, 18(1), p. 36.
- AFTERTRAUMA, 2017. *Evi's Story - Survivor Stories*. [online]. Centre for Trauma Sciences. Available from: <https://www.aftertrauma.org/survivors-stories/evis-story> [Accessed 11 Feb 2024].
- AFTERTRAUMA, 2023. *What is Trauma?* [online]. AfterTrauma. Available from: <https://www.aftertrauma.org/what-is-trauma/what-is-trauma> [Accessed 16 Dec 2023].
- AFTERTRAUMA, 2024. *AfterTrauma Recovery App*. [online]. AfterTrauma. Available from: <https://www.aftertrauma.org/recovery-app/recovery-app> [Accessed 6 Feb 2024].
- AL HANNA, R. et al., 2020. Multidisciplinary rehabilitation in persons with multiple trauma: A systematic review, 52(10), pp. 1–9.
- ALELE, F. and MALAU-ADULI, B., 2023a. 3.7 QUANTITATIVE RIGOUR. In: *An Introduction to Research Methods for Undergraduate Health Profession Students*. James Cook University, Townsville, QLD, Australia.: Pressbooks.
- ALELE, F. and MALAU-ADULI, B., 2023b. 1.3 RESEARCH PARADIGMS AND PHILOSOPHICAL ASSUMPTIONS. In: *An Introduction to Research Methods for Undergraduate Health Profession Students*. James Cook University, Townsville, QLD, Australia.: Pressbooks. Available from: <https://jcu.pressbooks.pub/intro-res-methods-health/chapter/1-3-research-paradigms-and-philosophical-assumptions/> [Accessed 31 Jul 2023].
- ALHARBI, R.J. et al., 2021. The effectiveness of trauma care systems at different stages of development in reducing mortality: a systematic review and meta-analysis. *World Journal of Emergency Surgery*, 16(1), p. 38.
- ALLMARK, P. et al., 2009. Ethical Issues in the Use of In-Depth Interviews: Literature Review and Discussion. *Research Ethics*, 5(2), pp. 48–54.
- ALTHOFF, A.D. and REEVES, R.A., 2023. Splinting. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK557673/> [Accessed 9 Feb 2024].
- ALTHUBAITI, A., 2016. Information bias in health research: definition, pitfalls, and adjustment methods. *Journal of Multidisciplinary Healthcare*, 9, pp. 211–217.
- AMBERSSCRIPT GLOBAL B.V., 2024. Amberscript: Audio & Video Transcription | Speech-to-text. Available from: <https://www.amberscript.com/en/> [Accessed 30 Jan 2024].
- AMERICAN COLLEGE OF SURGEONS, 2022. *Resources for Optimal Care of the Injured Patient (2022 Standards)*. Chicago, IL: American College of Surgeons. Available from: <https://www.facs.org/quality-programs/trauma/quality/verification-review-and-consultation-program/standards/2022-resources-repository/access/> [Accessed 13 Sep 2023].
- ANGERPOINTNER, K. et al., 2021. Quality of life after multiple trauma: results from a patient cohort treated in a certified trauma network. *European Journal of Trauma and Emergency Surgery*, 47(1), pp. 121–127.

- ARDOLINO, A., SLEAT, G. and WILLETT, K., 2012. Outcome measurements in major trauma—Results of a consensus meeting. *Injury*, 43(10), pp. 1662–1666.
- ARNOTT, R.E., 2023. *Exploring stakeholders' perceptions of peer support for adults with chronic pain: a mixed methods study*. Doctrate of Physiotherapy, Robert Gordon University.
- AROMATARIS, E. and MUNN, Z., eds., 2020. *JBI Manual for Evidence Synthesis*. JBI. Available from: <https://synthesismanual.jbi.global> [Accessed 28 Mar 2022].
- ASSOCIATION FOR THE ADVANCEMENT OF AUTOMOTIVE MEDICINE, 2021. *Abbreviated Injury Scale (AIS)*. [online]. Association for the Advancement of Automotive Medicine. Available from: <https://www.aaam.org/abbreviated-injury-scale-ais/> [Accessed 22 Sep 2021].
- AUSTRALIAN TRAUMA QUALITY IMPROVEMENT (AUSTQIP) COLLABORATION, 2021. Australia New Zealand Trauma Registry, Management of the Severely Injured, 1 July 2019 to 30 June 2020.
- BAKER, E. et al., 2021. Challenges associated with recovery from blunt thoracic injuries from hospital admission to six-months after discharge: A qualitative interview study. *International Emergency Nursing*, 57, pp. 1–9.
- BAKER, E. et al., 2022. The processes of hospital discharge and recovery after blunt thoracic injuries: The patient's perspective. *Nursing Open*, 9(3), pp. 1832–1843.
- BAKER, S.P. et al., 1974. The injury severity score: A method for describing patients with multiple injuries and evaluating emergency care. *Journal of Trauma and Acute Care Surgery*, 14(3), pp. 187–196.
- BAKER, S.P. and O'NEILL, B., 1976. THE INJURY SEVERITY SCORE: AN UPDATE. *Journal of Trauma and Acute Care Surgery*, 16(11), p. 882.
- BARRETT, A., KAJAMAA, A. and JOHNSTON, J., 2020. How to ... be reflexive when conducting qualitative research. *The Clinical Teacher*, 17(1), pp. 9–12.
- BEATTIE, J. et al., 2018. What Happens to the Farm? Australian Farmers' Experiences after a Serious Farm Injury. *Journal of Agromedicine*, 23(2), pp. 134–143.
- BECKETT, K. et al., 2014. Providing effective trauma care: the potential for service provider views to enhance the quality of care (qualitative study nested within a multicentre longitudinal quantitative study). *BMJ Open*, 4(7), p. e005668.
- BERECKI-GISOLF, J., THARANGA FERNANDO, D. and D'ELIA, A., 2022. International classification of disease based injury severity score (ICISS): A data linkage study of hospital and death data in Victoria, Australia. *Injury*, 53(3), pp. 904–911.
- BERENDS, L., 2011. Embracing the Visual: Using Timelines with In-depth Interviews on Substance Use and Treatment. *The Qualitative Report*, 16(1), pp. 1–9.
- BOOTH, A., 2016. Searching for qualitative research for inclusion in systematic reviews: a structured methodological review. *Systematic Reviews*, 5(1), p. 74.
- BORRELL-CARRIÓ, F., SUCHMAN, A.L. and EPSTEIN, R.M., 2004. The Biopsychosocial Model 25 Years Later: Principles, Practice, and Scientific Inquiry. *Annals of Family Medicine*, 2(6), pp. 576–582.

- BRAAF, S. et al., 2018. Patient-identified information and communication needs in the context of major trauma. *BMC Health Services Research*, 18(1), p. 163.
- BRAAF, S. et al., 2019. A Qualitative Exploration of Return to Work in the First 3-Years After Serious Injury. *Journal of Occupational & Environmental Medicine*, 61(12), pp. e461–e467.
- BRAAF, S. et al., 2020. Traumatic injury survivors' perceptions of their future: a longitudinal qualitative study. *Disability and Rehabilitation*, 42(19), pp. 2707–2717.
- BRADSHAW, C., ATKINSON, S. and DOODY, O., 2017. Employing a Qualitative Description Approach in Health Care Research. *Global Qualitative Nursing Research*, 4, p. 2333393617742282.
- BRAND, R.M. et al., 2018. Understanding the early support needs of survivors of traumatic events: The example of severe injury survivors. *Psychological Trauma: Theory, Research, Practice, and Policy*, 10(3), pp. 376–385.
- BRASURE, M. et al., 2013. Participation After Multidisciplinary Rehabilitation for Moderate to Severe Traumatic Brain Injury in Adults: A Systematic Review. *Archives of Physical Medicine and Rehabilitation*, 94(7), pp. 1398–1420.
- BRAUN, V. et al., 2019. Thematic Analysis. In: P. LIAMPUTTONG, ed. *Handbook of Research Methods in Health Social Sciences*. Singapore: Springer. pp. 843–860. Available from: [https://doi.org/10.1007/978-981-10-5251-4\\_103](https://doi.org/10.1007/978-981-10-5251-4_103) [Accessed 17 Jan 2024].
- BRAUN, V. and CLARKE, V., 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), pp. 77–101.
- BRAUN, V. and CLARKE, V., 2014. What can “thematic analysis” offer health and wellbeing researchers? *International Journal of Qualitative Studies on Health and Well-Being*, 9(1), p. 26152.
- BRAUN, V. and CLARKE, V., 2021. Can I use TA? Should I use TA? Should I *not* use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling and Psychotherapy Research*, 21(1), pp. 37–47.
- BRIDGER, K. et al., 2021. Patient Perspectives on Key Outcomes for Vocational Rehabilitation Interventions Following Traumatic Injury. *International Journal of Environmental Research and Public Health*, 18(4), p. 2035.
- BRIGUGLIO, M. et al., 2019. Nutritional support for enhanced recovery programs in orthopedics: Future perspectives for implementing clinical practice. *Nutrition Clinique et Métabolisme*, 33(3), pp. 190–198.
- BROWN, K. et al., 2020. 'I've got to be independent': views of older people on recovery following road traffic injury in New South Wales, Australia. *BMC Public Health*, 20(1), p. 1294.
- BSRM, 2023. Specialist neuro-rehabilitation services: providing for patients with complex rehabilitation needs. Available from: <https://www.bsrm.org.uk/resources/guideline-documents/>.
- BUCHOLTZ, M., 2000. The politics of transcription. *Journal of Pragmatics*, 32(10), pp. 1439–1465.
- CALDERWOOD, C., 2017. Scottish Trauma Network\_Chief Medical Officer Report. Available from: <https://scottishtraumanetwork.com/wp-content/uploads/2019/12/STN-CMO-Report.pdf> [Accessed 16 Dec 2023].

- CAMERON, P.A. et al., 2008. A statewide system of trauma care in Victoria: effect on patient survival. *The Medical Journal of Australia*, 189(10), pp. 546–550.
- CENTRE FOR TRAUMA SCIENCES, 2023. *Patient Self Management*. [online]. Centre for Trauma Sciences. Available from: <https://www.c4ts.qmul.ac.uk/london-trauma-system/public-and-patient-involvement> [Accessed 14 Sep 2023].
- CHAMPION, H.R. et al., 1990. A new characterization of injury severity. *The Journal of Trauma*, 30(5), pp. 539–545; discussion 545-546.
- CHAMPION, H.R. et al., 1989. A Revision of the Trauma Score. *Journal of Trauma and Acute Care Surgery*, 29(5), p. 623.
- CHARLIFUE, S.B. et al., 2016. Family caregivers of individuals with spinal cord injury: exploring the stresses and benefits. *Spinal Cord*, 54(9), pp. 732–736.
- CHAUDHARY, M.A. et al., 2017. Incidence and Predictors of Opioid Prescription at Discharge After Traumatic Injury. *JAMA Surgery*, 152(10), pp. 930–936.
- CHAWDA, M.N. et al., 2004. Predicting outcome after multiple trauma: which scoring system? *Injury*, 35(4), pp. 347–358.
- CHESSER, T.J. et al., 2019. Development of trauma systems in Europe—reports from England, Germany, the Netherlands, and Spain. *OTA International*, 2(S1), p. e019.
- CHOI, J. et al., 2021. The impact of trauma systems on patient outcomes. *Current Problems in Surgery*, 58(1), p. 100849.
- CHRISTIE, N. et al., 2017. The role of social networks in supporting the travel needs of people after serious traumatic injury: A nested qualitative study. *JOURNAL OF TRANSPORT & HEALTH*, 6, pp. 84–92.
- CHRISTIE, N. et al., 2016. Seeking support after hospitalisation for injury: a nested qualitative study of the role of primary care. *British Journal of General Practice*, 66(642), pp. e24–e31.
- CLARIDGE, J.A. et al., 2013. Regional collaboration across hospital systems to develop and implement trauma protocols saves lives within 2 years. *Surgery*, 154(4), pp. 875–882; discussion 882-884.
- CLAY, F.J. et al., 2012. A Systematic Review of Early Prognostic Factors for Persistent Pain Following Acute Orthopedic Trauma. *Pain Research and Management*, 17(1), pp. 35–44.
- CLAYDON, J. et al., 2017. Traumatic multiple rib fractures: key health outcomes influencing rehabilitation and recovery from a patient perspective. *Physiotherapy*, 103, pp. e40–e41.
- CLAYDON, J.H., ROBINSON, L. and ALDRIDGE, S.E., 2017. Patients' perceptions of repair, rehabilitation and recovery after major orthopaedic trauma: a qualitative study. *Physiotherapy*, 103(3), pp. 322–329.
- CLAYDON, J. et al., 2018. Challenges experienced during rehabilitation after traumatic multiple rib fractures: a qualitative study. *Disability and Rehabilitation*, 40(23), pp. 2780–2789.
- CLOSE, G.L. et al., 2019. Nutrition for the Prevention and Treatment of Injuries in Track and Field Athletes. *International Journal of Sport Nutrition and Exercise Metabolism*, 29(2), pp. 189–197.



- COLLINS, J. et al., 2022. Adult patient and carer experiences of planning for hospital discharge after a major trauma event: a qualitative systematic review. *Disability and Rehabilitation*, 0(0), pp. 1–21.
- COLLINS, J., LIZARONDO, L. and PORRITT, K., 2020. Adult patient and/or carer experiences of planning for hospital discharge after major trauma: a qualitative systematic review protocol. *JBI Evidence Synthesis*, 18(2), pp. 1–7.
- CONN, L.G. et al., 2023. A qualitative study of older adult trauma survivors' experiences in acute care and early recovery. *CMAJ Open*, 11(2), pp. E323–E328.
- CONNELLY, L.M., 2016. Understanding Research. Trustworthiness in Qualitative Research. *MEDSURG Nursing*, 25(6), pp. 435–436.
- COPAS, D.P. and MORAN, C.G., 2014. Major trauma care in England. *Bone & Joint* 360, 3(2), pp. 2–5.
- COPEL, W.S. et al., 1990. Progress in characterizing anatomic injury. *The Journal of Trauma*, 30(10), pp. 1200–1207.
- COULTER, A. and OLDHAM, J., 2016. Person-centred care: what is it and how do we get there? *Future Hospital Journal*, 3(2), pp. 114–116.
- CRESWELL, J. and CLARK, V., 2017. *Designing and Conducting Mixed Methods Research*. Third. California, USA: SAGE Publications, Inc.
- CRESWELL, J. and CRESWELL, J., 2018. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Fifth. California, USA: SAGE Publications, Inc.
- CUMPSTON, M. et al., 2023. Chapter I: Introduction. In: J. HIGGINS et al., eds. *Cochrane Handbook for Systematic Reviews of Interventions*. Cochrane. Available from: [www.training.cochrane.org/handbook](http://www.training.cochrane.org/handbook).
- DARBANDSAR MAZANDARANI, P. et al., 2016. Acute Physiology and Chronic Health Evaluation (APACHE) III Score compared to Trauma-Injury Severity Score (TRISS) in Predicting Mortality of Trauma Patients. *Emergency*, 4(2), pp. 88–91.
- Data Protection Act 2018, c.12*, 2018. [online]. King's Printer of Acts of Parliament. Available from: <https://www.legislation.gov.uk/ukpga/2018/12/contents/enacted> [Accessed 5 Aug 2023].
- DAVID, S.D. et al., 2022. Measuring socioeconomic outcomes in trauma patients up to one year post-discharge: A systematic review and meta-analysis. *Injury*, 53(2), pp. 272–285.
- DAWES, M. et al., 2005. Sicily statement on evidence-based practice. *BMC Medical Education*, 5(1), p. 1.
- DE MUNTER, L. et al., 2017. Mortality prediction models in the general trauma population: A systematic review. *Injury*, 48(2), pp. 221–229.
- DEEGAN, P.E., 1988. Recovery: The Lived Experience of Rehabilitation. *Psychosocial Rehabilitation Journal*, 11(4), p. 8.
- DEFENCE MEDICAL SERVICES, 2024. *Defence Medical Services*. [online]. GOV.UK. Available from: <https://www.gov.uk/government/groups/defence-medical-services> [Accessed 19 Feb 2024].

- DELL'OSSO, L. et al., 2022. Post Traumatic Growth (PTG) in the Frame of Traumatic Experiences. *Clinical Neuropsychiatry*, 19(6), pp. 390–393.
- DELPRADO AM, 2007. International. Trauma systems in Australia. *Journal of Trauma Nursing*, 14(2), pp. 93–97.
- DENG, Q. et al., 2016. Comparison of the Ability to Predict Mortality between the Injury Severity Score and the New Injury Severity Score: A Meta-Analysis. *International Journal of Environmental Research and Public Health*, 13(8), p. 825.
- DEPARTMENT FOR WORK & PENSIONS and DEPARTMENT OF HEALTH, 2016. Work, Health and Disability Green Paper Data Pack, pp. 1–61.
- DEVLIN, N.J. et al., 2018. Valuing health-related quality of life: An EQ-5D-5L value set for England. *Health Economics*, 27(1), pp. 7–22.
- DEVLIN, N., PARKIN, D. and JANSSEN, B., 2020a. An Introduction to EQ-5D Instruments and Their Applications. In: N. DEVLIN, D. PARKIN and B. JANSSEN, eds. *Methods for Analysing and Reporting EQ-5D Data*. Cham: Springer International Publishing. pp. 1–22. Available from: [https://doi.org/10.1007/978-3-030-47622-9\\_1](https://doi.org/10.1007/978-3-030-47622-9_1) [Accessed 7 Oct 2021].
- DEVLIN, N., PARKIN, D. and JANSSEN, B., 2020b. *Methods for Analysing and Reporting EQ-5D Data*. Cham: Springer International Publishing. Available from: <http://link.springer.com/10.1007/978-3-030-47622-9> [Accessed 1 Dec 2022].
- DICKSON-SWIFT, V., 2022. Undertaking qualitative research on trauma: impacts on researchers and guidelines for risk management. *Qualitative Research in Organizations and Management: An International Journal*, 17(4), pp. 469–486.
- DIJKERS, M.P., MURPHY, S.L. and KRELLMAN, J., 2012. Evidence-Based Practice for Rehabilitation Professionals: Concepts and Controversies. *Archives of Physical Medicine and Rehabilitation*, 93(8, Supplement), pp. S164–S176.
- DIJKINK, S. et al., 2017. Trauma systems around the world: A systematic overview. *Journal of Trauma and Acute Care Surgery*, 83, p. 1.
- DINEEN-GRIFFIN, S. et al., 2019. Helping patients help themselves: A systematic review of self-management support strategies in primary health care practice. *PLoS ONE*, 14(8), p. e0220116.
- DIXON-WOODS, M., BOOTH, A. and SUTTON, A.J., 2007. Synthesizing qualitative research: a review of published reports. *Qualitative Research*, 7(3), pp. 375–422.
- DODDS, H. and KHAN, A., 2020. STAG PROMs Protocol.
- DOYLE, L. et al., 2020. An overview of the qualitative descriptive design within nursing research. *Journal of Research in Nursing: JRN*, 25(5), pp. 443–455.
- DUCHIN, E.R. et al., 2022. Perspectives on recovery from older adult trauma survivors living in rural areas. *Trauma Surgery & Acute Care Open*, 7(1), p. e000881.
- DURAN, S.F., MAZZURCO, L. and PALMER, R.M., 2018. Trauma Consults by Geriatricians: Looking Into the Black Box. *Gerontology & Geriatric Medicine*, 4, p. 2333721418817668.

- EDEMEKONG, P.F. et al., 2023. Activities of Daily Living. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK470404/> [Accessed 12 Feb 2024].
- EKEGREN, C.L. et al., 2018. Physical Activity and Sedentary Behavior Subsequent to Serious Orthopedic Injury: A Systematic Review. *Archives of Physical Medicine and Rehabilitation*, 99(1), pp. 164-177.e6.
- EKEGREN, C.L. et al., 2020. Adaptation, self-motivation and support services are key to physical activity participation three to five years after major trauma: a qualitative study. *Journal of Physiotherapy (Elsevier)*, 66(3), pp. 188–195.
- EKELUND, U. et al., 2016. Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonised meta-analysis of data from more than 1 million men and women. *The Lancet*, 388(10051), pp. 1302–1310.
- ELLIS, P., 2018. The benefits and drawbacks of open and restricted visiting hours. *Nursing Times*, 114(12), pp. 18–20.
- ENGEL, G.L., 1977. The need for a new medical model: a challenge for biomedicine. *Science (New York, N.Y.)*, 196(4286), pp. 129–136.
- EUROQOL GROUP, 2022. *About EQ-5D*. [online]. EQ-5D. Available from: <https://euroqol.org/eq-5d-instruments/> [Accessed 28 Nov 2022].
- EVANS, D.W. et al., 2022. Estimating Risk of Chronic Pain and Disability Following Musculoskeletal Trauma in the United Kingdom. *JAMA Network Open*, 5(8), p. e2228870.
- FAKHRY, M. and MOHAMMED, W.E., 2022. Impact of family presence on healthcare outcomes and patients' wards design. *Alexandria Engineering Journal*, 61(12), pp. 10713–10726.
- FARKAS, M., 1996. Recovery, rehabilitation, reintegration: Words vs. meaning. *World Association of Psychosocial Rehabilitation Bulletin*, 8(4), pp. 6–8.
- FINDLAY, G. et al., 2007. Trauma: Who Cares? *National Confidential Enquiry into Patient Outcome and Death*, p. 151.
- FINSTAD, J. et al., 2021. Discharge from the trauma centre: exposure to opioids, unmet information needs and lack of follow up-a qualitative study among physical trauma survivors. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 29(1), p. 121.
- FISCHER, A. et al., 2023. The Australian Trauma Registry (ATR): a leading clinical quality registry. *European Journal of Trauma and Emergency Surgery*, 49(4), pp. 1639–1645.
- FLEMINGER, S. and PONSFORD, J., 2005. Long term outcome after traumatic brain injury. *BMJ : British Medical Journal*, 331(7530), pp. 1419–1420.
- FOSSEY, E. et al., 2002. Understanding and Evaluating Qualitative Research. *Australian & New Zealand Journal of Psychiatry*, 36(6), pp. 717–732.
- FRINK, M. et al., 2017. Multiple Trauma and Emergency Room Management. *Deutsches Ärzteblatt International*, 114(29–30), pp. 497–503.

- GABBE, B.J. et al., 2011. Modelling Long Term Disability following Injury: Comparison of Three Approaches for Handling Multiple Injuries. *PLOS ONE*, 6(9), p. e25862.
- GABBE, B.J. et al., 2014. Financial and employment impacts of serious injury: A qualitative study. *Injury*, 45(9), pp. 1445–1451.
- GABBE, B.J. et al., 2015. RESTORE: REcovery after Serious Trauma--Outcomes, Resource use and patient Experiences study protocol. *Injury Prevention : Journal of the International Society for Child and Adolescent Injury Prevention*, 21(5), pp. 348–354.
- GABBE, B.J. et al., 2016. Return to Work and Functional Outcomes After Major Trauma: Who Recovers, When, and How Well? *Annals of Surgery*, 263(4), p. 623.
- GABBE, B.J. et al., 2017. Long-term health status and trajectories of seriously injured patients: A population-based longitudinal study. *PLOS Medicine*, 14(7), pp. 1–18.
- GALE, N.K. et al., 2013. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology*, 13(1), p. 117.
- GAVIN, J.P. et al., 2022. Priorities for returning to work after traumatic injury: A public and professional involvement study. *British Journal of Occupational Therapy*, 85(12), pp. 974–983.
- GLOBAL HEALTH METRICS, 2020. Injuries—Level 1 cause. Available from: <https://www.thelancet.com/pb-assets/Lancet/gbd/summaries/diseases/injuries.pdf> [Accessed 17 Sep 2021].
- GOLDSMITH, H., MCCLOUGHEN, A. and CURTIS, K., 2018. The experience and understanding of pain management in recently discharged adult trauma patients: A qualitative study. *Injury*, 49(1), pp. 110–116.
- GOOGLE, 2024. *Brand Resource Center | Products and Services - Geo Guidelines*. [online]. Brand Resource Centre. Available from: <https://about.google/brand-resource-center/products-and-services/geo-guidelines/> [Accessed 10 Feb 2024].
- GOTLIB CONN, L. et al., 2018. Trauma patient discharge and care transition experiences: Identifying opportunities for quality improvement in trauma centres. *Injury*, 49(1), pp. 97–103.
- GRAN, G. and NILSSON, R., 2023. Care at Discharge: A systematic literature study based on patients' experiences, p. 45.
- GRANT, M. and BOOTH, A., 2009. A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal*, 26, pp. 91–108.
- GRAY, M. et al., 2018. Long-Term Functional Outcomes in Military Service Members and Veterans After Traumatic Brain Injury/Polytrauma Inpatient Rehabilitation. *Archives of Physical Medicine and Rehabilitation*, 99(2, Supplement), pp. S33–S39.
- GRZELAK, S. et al., 2022. Pain Management Strategies After Orthopaedic Trauma: A Mixed-Methods Study with a View to Optimizing Practices. *Journal of Pain Research*, 15, pp. 385–402.
- GUBA, E.G., 1990. The Alternative Paradigm Dialog. In: *The Paradigm Dialog*. California, USA: SAGE Publications, Inc. pp. 17–27.

- HAAGSMA, J.A. et al., 2016. The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013. *Injury Prevention*, 22(1), pp. 3–18.
- HAGEN, E.M. et al., 2012. Traumatic spinal cord injuries – incidence, mechanisms and course. *Tidsskrift for Den Norske Legeforening*. [online]. Available from: <https://tidsskriftet.no/en/2012/04/traumatic-spinal-cord-injuries-incidence-mechanisms-and-course> [Accessed 30 Jan 2024].
- HAIGH, P.C. and WITHAM, G., 2015. Distress Protocol for qualitative data collection. *Manchester Metropolitan University*. [online]. Available from: <https://www.mmu.ac.uk/media/mmuacuk/content/documents/rke/Advisory-Distress-Protocol.pdf>.
- HALCOMB, E. et al., 2005. Life beyond severe traumatic injury: an integrative review of the literature. *Australian Critical Care*, 18(1), pp. 17–24.
- HARBOUR, R., LOWE, G. and TWADDLE, S., 2011. Scottish Intercollegiate Guidelines Network: the first 15 years (1993–2008). *The Journal of the Royal College of Physicians of Edinburgh*, 41(2), pp. 163–168.
- HARVEY, L.A., 2016. Physiotherapy rehabilitation for people with spinal cord injuries. *Journal of Physiotherapy*, 62(1), pp. 4–11.
- HAVELKA, M., LUANIN, J.D. and LUANIN, D., 2009. Biopsychosocial Model – The Integrated Approach to Health and Disease. *Coll. Antropol.*
- HEALTH AND SOCIAL CARE ALLIANCE SCOTLAND, 2021. Right to Rehab coalition. *Health and Social Care Integration* [online]. Available from: <https://www.alliance-scotland.org.uk/health-and-social-care-integration/right-to-rehab/> [Accessed 24 May 2021].
- HEALTH AND SOCIAL CARE ALLIANCE SCOTLAND, n.d. Right to Rehab coalition. *Health and Social Care Integration* [online]. Available from: <https://www.alliance-scotland.org.uk/health-and-social-care-integration/right-to-rehab/> [Accessed 24 May 2021].
- HEALTH RESEARCH AUTHORITY, 2022. *Is my study research?* [online]. Is my study research? HRA tool. Available from: <https://www.hra-decisiontools.org.uk/research/result7.html> [Accessed 5 Aug 2023].
- HEATHCOTE, K. et al., 2021. Caregiver resilience and patients with severe musculoskeletal traumatic injuries. *Disability and Rehabilitation*, 43(16), pp. 2320–2331.
- HOBBS, M. et al., 1996. A randomised controlled trial of psychological debriefing for victims of road traffic accidents. *BMJ*, 313(7070), pp. 1438–1439.
- HOFFMAN, K. et al., 2014. Health Outcome after Major Trauma: What Are We Measuring? Edited by Hemachandra Reddy. *PLoS ONE*, 9(7), p. e103082.
- HOFFMAN, K.P. et al., 2016. Minimum data set to measure rehabilitation needs and health outcome after major trauma: application of an international framework. *European Journal of Physical and Rehabilitation Medicine*, 52(3), pp. 331–346.
- HOLBROOK, T.L. et al., 1999. Outcome after Major Trauma: 12-Month and 18-Month Follow-Up Results from the Trauma Recovery Project. *Journal of Trauma and Acute Care Surgery*, 46(5), pp. 765–773.

- HOPE, L., MULLIS, R. and GABBERT, F., 2013. The Timeline Technique. *CREST*, pp. 1–4.
- HUDSON, C., RADFORD, K. and KETTLEWELL, J., 2022. A Qualitative Study to Understand the Impact of Caring for Traumatic Injury Survivors. *International Journal of Environmental Research and Public Health*, 19(23), p. 16202.
- HUGHES, L., 2015. Principles and expectations for good adult rehabilitation. Available from: <https://www.networks.nhs.uk/nhs-networks/clinical-commissioning-community/documents/principles-and-expectations> [Accessed 2 Oct 2021].
- HUMAN DEVELOPMENT REPORT OFFICE, 2022. *Human Development Index (HDI)*. [online]. Human Development Reports. Available from: <https://hdr.undp.org/en/content/human-development-index-hdi> [Accessed 6 May 2022].
- INTERNATIONAL ASSOCIATION FOR THE STUDY OF PAIN, 2018. Opioids for Pain Management. *International Association for the Study of Pain (IASP)* [online]. Available from: <https://www.iasp-pain.org/advocacy/iasp-statements/opioids-for-pain-management/> [Accessed 19 Feb 2024].
- JACKSON, A. et al., 2021. Connecting with trauma patients after discharge: A phone call follow-up study. *Journal of Trauma Nursing*, 28(3), pp. 179–185.
- JAMES, A. et al., 2022. Important Issues to Severe Trauma Survivors: A Qualitative Study. *Annals of Surgery*, 275(1), pp. 189–195.
- JANSSEN, M.F., BONSEL, G.J. and LUO, N., 2018. Is EQ-5D-5L Better Than EQ-5D-3L? A Head-to-Head Comparison of Descriptive Systems and Value Sets from Seven Countries. *Pharmacoeconomics*, 36(6), pp. 675–697.
- JAVALI, R.H. et al., 2019. Comparison of Injury Severity Score, New Injury Severity Score, Revised Trauma Score and Trauma and Injury Severity Score for Mortality Prediction in Elderly Trauma Patients. *Indian Journal of Critical Care Medicine : Peer-Reviewed, Official Publication of Indian Society of Critical Care Medicine*, 23(2), pp. 73–77.
- JENEWEIN, J. et al., 2009. Development of chronic pain following severe accidental injury. Results of a 3-year follow-up study. *Journal of Psychosomatic Research*, 66(2), pp. 119–126.
- JOANNA BRIGGS INSTITUTE LEVELS OF EVIDENCE AND GRADES OF RECOMMENDATION WORKING PARTY, 2013. JBI Grades of Recommendation.
- JORDAN, Z. et al., 2015. Now that we're here, where are we? The JBI approach to evidence-based healthcare 20 years on. *JBI Evidence Implementation*, 13(3), p. 117.
- KAISER, K., 2009. Protecting Respondent Confidentiality in Qualitative Research. *Qualitative Health Research*, 19(11), pp. 1632–1641.
- KAMPMAN, H. et al., 2015. "I can do things now that people thought were impossible, actually, things that I thought were impossible": A meta-synthesis of the qualitative findings on posttraumatic growth and severe physical injury. *Canadian Psychology/Psychologie Canadienne*, 56(3), pp. 283–294.
- KANERIA, A.M., 2015. The history and development of trauma and emergency care in England. *Trauma*, 17(1), pp. 52–57.

- KASKE, S. et al., 2014. Quality of life two years after severe trauma: A single centre evaluation. *Injury*, 45, pp. S100–S105.
- KELLEZI, B. et al., 2015. Understanding and meeting information needs following unintentional injury: Comparing the accounts of patients, carers and service providers. *Injury*, 46(4), pp. 564–571.
- KENDRICK, D. et al., 2017. Psychological morbidity and health-related quality of life after injury: multicentre cohort study. *Quality of Life Research*, 26(5), pp. 1233–1250.
- KETTLEWELL, J. et al., 2021. A study of mapping usual care and unmet need for vocational rehabilitation and psychological support following major trauma in five health districts in the UK. *Clinical Rehabilitation*, 35(5), pp. 750–764.
- KHAN, F., AMATYA, B. and HOFFMAN, K., 2012. Systematic review of multidisciplinary rehabilitation in patients with multiple trauma. *The British Journal of Surgery*, 99 Suppl 1, pp. 88–96.
- KIMMEL, L.A. et al., 2016. Discharge from the acute hospital: trauma patients' perceptions of care. *Australian Health Review*, 40(6), pp. 625–632.
- KINGSTON, G.A., JUDD, J. and GRAY, M.A., 2015. The experience of medical and rehabilitation intervention for traumatic hand injuries in rural and remote North Queensland: a qualitative study. *Disability & Rehabilitation*, 37(5), pp. 423–429.
- KIRSHBLUM, S. et al., 2021. Characterizing Natural Recovery after Traumatic Spinal Cord Injury. *Journal of Neurotrauma*, 38(9), pp. 1267–1284.
- KIYIMBA, N. and O'REILLY, M., 2016. The risk of secondary traumatic stress in the qualitative transcription process: a research note. *Qualitative Research*, 16(4), pp. 468–476.
- KNAUS, W. et al., 1991. The APACHE III Prognostic System\* Risk Prediction of Hospital Mortality for Critically III Hospitalized Adults. *Chest*, 100(6), pp. 1619–1636.
- KOLAR, K. et al., 2015. Timeline Mapping in Qualitative Interviews: A Study of Resilience With Marginalized Groups. *International Journal of Qualitative Methods*, 14, pp. 13–32.
- KROMREY, L. et al., 2022. *Recovery experiences of adults with moderate and major trauma after discharge from the acute care setting: A qualitative systematic review protocol*. [online]. PROSPERO. Available from: [https://www.crd.york.ac.uk/prospero/display\\_record.php?RecordID=338736](https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=338736) [Accessed 19 Dec 2022].
- KRUG, E.G., SHARMA, G.K. and LOZANO, R., 2000. The global burden of injuries. *American Journal of Public Health*, 90(4), pp. 523–526.
- LACHMAN, M.E., TESHAE, S. and AGRIGOROAEI, S., 2015. Midlife as a Pivotal Period in the Life Course: Balancing Growth and Decline at the Crossroads of Youth and Old Age. *International Journal of Behavioral Development*, 39(1), pp. 20–31.
- LAPSLEY, P. and GROVES, T., 2004. The patient's journey: travelling through life with a chronic illness. *BMJ : British Medical Journal*, 329(7466), pp. 582–583.
- LENDRUM, R.A. and LOCKEY, D.J., 2013. Trauma system development. *Anaesthesia*, 68(s1), pp. 30–39.

- LEVESQUE, J.-F., HARRIS, M.F. and RUSSELL, G., 2013. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *International Journal for Equity in Health*, 12(1), p. 18.
- LEWIN, S. et al., 2018. Applying GRADE-CERQual to qualitative evidence synthesis findings: introduction to the series. *Implementation Science*, 13(1), p. 2.
- LI, L.M. et al., 2021. Management of traumatic brain injury (TBI): a clinical neuroscience-led pathway for the NHS. *Clinical Medicine*, 21(2), pp. e198–e205.
- LIESHOUT, K. et al., 2020. Burden and Preparedness amongst Informal Caregivers of Adults with Moderate to Severe Traumatic Brain Injury. *International Journal of Environmental Research and Public Health*, 17(17), p. 6386.
- LINNARSSON, J.R., BUBINI, J. and PERSEIUS, K.I., 2010. A meta-synthesis of qualitative research into needs and experiences of significant others to critically ill or injured patients. *Journal of Clinical Nursing*, 19(21–22), pp. 3102–3111.
- LLAQUET BAYO, H. et al., 2019. Analysis of quality of life after major trauma: a spanish follow-up cohort study. *European Journal of Trauma and Emergency Surgery*, 45(2), pp. 289–297.
- LOCKWOOD, C. et al., 2020. Chapter 2: Systematic reviews of qualitative evidence. In: Aromataris E, Munn Z (Editors). *JBIManual for Evidence Synthesis*.
- LOCKWOOD, C., MUNN, Z. and PORRITT, K., 2015. Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *Int J Evid Based Healthc.*, 13(3), pp. 179–187.
- LOTFALLA, A. et al., 2023. Health-related quality of life after severe trauma and available PROMS: an updated review (part I). *European Journal of Trauma and Emergency Surgery*, 49(2), pp. 747–761.
- LUMIVERO, 2022. NVivo.
- LY, S., RUNACRES, F. and POON, P., 2021. Journey mapping as a novel approach to healthcare: a qualitative mixed methods study in palliative care. *BMC Health Services Research*, 21(1), p. 915.
- MÄKELÄ, P. et al., 2019. Supporting self-management after traumatic brain injury: Codesign and evaluation of a new intervention across a trauma pathway. *Health Expectations*, 22(4), pp. 632–642.
- MANSKOW, U.S. et al., 2015. Factors Affecting Caregiver Burden 1 Year After Severe Traumatic Brain Injury: A Prospective Nationwide Multicenter Study. *The Journal of Head Trauma Rehabilitation*, 30(6), pp. 411–423.
- MARTINO, C. et al., 2020. Long-term outcomes in major trauma patients and correlations with the acute phase. *World Journal of Emergency Surgery*, 15(1), p. 6.
- MAYOU, R., BRYANT, B. and DUTHIE, R., 1993. Psychiatric consequences of road traffic accidents. *BMJ*, 307(6905), pp. 647–651.
- MAZWI, N.L., ADELETTI, K. and HIRSCHBERG, R.E., 2015. Traumatic Spinal Cord Injury: Recovery, Rehabilitation, and Prognosis. *Current Trauma Reports*, 1(3), pp. 182–192.



- MCCREA, M.A. et al., 2021. Functional Outcomes Over the First Year After Moderate to Severe Traumatic Brain Injury in the Prospective, Longitudinal TRACK-TBI Study. *JAMA Neurology*, 78(8), pp. 982–992.
- MCELROY, L. et al., 2022. Use of a modified Delphi process to develop research priorities in major trauma. *European Journal of Trauma and Emergency Surgery*, 48(2), pp. 1453–1461.
- MCKECHNIE, M., BURLEY, K. and GILHOOLY, A., 2021. Scottish Trauma Network Report to Scottish Parliament Health and Sport Committee. Available from: <https://scottishtraumanetwork.com/wp-content/uploads/2021/02/2021-01-STN-Report-to-HS-Com-1.0.pdf> [Accessed 17 Oct 2021].
- MCKECHNIE, M. et al., 2023. Annual Report 2022/23. Available from: <https://scottishtraumanetwork.com/wp-content/uploads/2023/11/2022-23-STN-Annual-Report.pdf> [Accessed 10 Feb 2024].
- MCMULLIN, C., 2023. Transcription and Qualitative Methods: Implications for Third Sector Research. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 34(1), pp. 140–153.
- MENON, D.K. et al., 2010. Position Statement: Definition of Traumatic Brain Injury. *Archives of Physical Medicine and Rehabilitation*, 91(11), pp. 1637–1640.
- MICROSOFT, 2023. Microsoft Teams.
- MICROSOFT CORPORATION, 2022. Microsoft 365.
- MIDLANDS CRITICAL CARE & TRAUMA NETWORKS, 2024. Trauma Networks [Google Maps]. Available from: <https://www.google.com/maps/d/u/0/viewer?mid=1bJvF8AG4F0RjF7wVJjicsnKC3qOu-TT6&ll=56.96938333671051%2C-2.5183835520211724&z=7>.
- MOCK, C. et al., eds., 2004. *Guidelines for essential trauma care*. Geneva: World Health Organization.
- MOCK, C. et al., 2012. An Estimate of the Number of Lives that Could be Saved through Improvements in Trauma Care Globally. *World Journal of Surgery*, 36(5), p. 1.
- MORAN, C.G. et al., 2018. Changing the System - Major Trauma Patients and Their Outcomes in the NHS (England) 2008–17. *EClinicalMedicine*, 2–3, pp. 13–21.
- MUNCE, S.E.P. et al., 2016. Meaning of self-management from the perspective of individuals with traumatic spinal cord injury, their caregivers, and acute care and rehabilitation managers: an opportunity for improved care delivery. *BMC Neurology*, 16(1), p. 11.
- MUNCE, S.E. et al., 2014. Perceived facilitators and barriers to self-management in individuals with traumatic spinal cord injury: a qualitative descriptive study. *BMC Neurology*, 14(1), p. 48.
- MUNN, Z. et al., 2014. Establishing confidence in the output of qualitative research synthesis: the ConQual approach. *BMC Medical Research Methodology*, 14(1), p. 108.
- MUNN, Z. et al., 2019. The development of software to support multiple systematic review types: the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information (JBI SUMARI). *International Journal of Evidence-Based Healthcare*, 17(1), pp. 36–43.
- MURRAY, M. et al., 2019. ‘It could have been a lot worse’: the psychological effects of farm-related serious injury in Victoria. *Rural & Remote Health*, 19(3), pp. 1–7.

- NAS, K. et al., 2015. Rehabilitation of spinal cord injuries. *World Journal of Orthopedics*, 6(1), pp. 8–16.
- NATHENS, A.B. et al., 2000. The effect of organized systems of trauma care on motor vehicle crash mortality. *JAMA*, 283(15), pp. 1990–1994.
- NATIONAL AUDIT OFFICE, 2010. Major trauma care in England. Available from: <https://www.nao.org.uk/wp-content/uploads/2010/02/0910213.pdf> [Accessed 16 Oct 2021].
- NATIONAL CENTER FOR HEALTH STATISTICS, 2015. *ICD - ICD-10-CM - International Classification of Diseases, (ICD-10-CM/PCS Transition*. [online]. Available from: [https://www.cdc.gov/nchs/icd/icd10cm\\_pcs\\_background.htm](https://www.cdc.gov/nchs/icd/icd10cm_pcs_background.htm) [Accessed 20 Jan 2024].
- NATIONAL CENTER FOR HEALTH STATISTICS, 2021. *Injury Data and Resources - ICD Injury Matrices*. [online]. CDC. Available from: [https://www.cdc.gov/nchs/injury/injury\\_matrices.htm](https://www.cdc.gov/nchs/injury/injury_matrices.htm) [Accessed 16 Dec 2023].
- NATIONAL CLINICAL GUIDELINE CENTRE (UK), 2016. Continuity of care: the trauma coordinator role. In: *Major Trauma: Service Delivery*. National Institute for Health and Care Excellence (NICE). Available from: <https://www.ncbi.nlm.nih.gov/books/NBK367685/> [Accessed 20 Sep 2023].
- NATIONAL COMMISSION FOR THE PROTECTION OF HUMAN SUBJECTS OF and BIOMEDICAL AND BEHAVIORAL RESEARCH, 1979. The Belmont Report.
- NATIONAL DATA GUARDIAN, 2020. *The Caldicott Principles*. [online]. GOV.UK. Available from: <https://www.gov.uk/government/publications/the-caldicott-principles> [Accessed 5 Aug 2023].
- NATIONAL INSTITUTE FOR HEALTH AND CARE RESEARCH, 2024. *Evidence Synthesis | NIHR*. [online]. Evidence Synthesis. Available from: <https://www.nihr.ac.uk/explore-nihr/funding-programmes/evidence-synthesis.htm> [Accessed 21 Jan 2024].
- NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES, 2018. Physical Trauma Fact Sheet. Available from: <https://www.nigms.nih.gov/education/fact-sheets/Documents/fact-sheet-physical-trauma.pdf> [Accessed 16 Dec 2023].
- NATIONAL RECORDS OF SCOTLAND, 2023. Scotland's Census - At a glance: Ethnic groups. Available from: <https://www.scotlandscensus.gov.uk/census-results/at-a-glance/ethnicity/> [Accessed 11 Feb 2024].
- NATIONAL SCIENCE FOUNDATION, 2018. Definitions of Research and Development: An Annotated Compilation of Official Sources. Available from: <https://nces.nsf.gov/pubs/nces22209>.
- NEALE, J. and STRANG, J., 2015. Blending qualitative and quantitative research methods to optimize patient reported outcome measures (PROMs). *Addiction*, 110(8), pp. 1215–1216.
- NEWCOMB, A.B. and HYMES, R.A., 2017. Life Interrupted: The Trauma Caregiver Experience. *Journal of Trauma Nursing*, 24(2), pp. 125–133.
- NHS ENGLAND, 2013. *Independent review of Major Trauma Networks reveals increase in patient survival rates*. [online]. NHS. Available from: <https://www.england.nhs.uk/2013/06/incr-pati-survivals/> [Accessed 17 Oct 2021].
- NHS ENGLAND, 2016. Commissioning guidance for rehabilitation.

- NHS ENGLAND, 2018. Major Trauma Rehabilitation Prescription 2019.
- NHS ENGLAND, 2021. *NHS England » Improving Rehabilitation Services*. [online]. Available from: <https://www.england.nhs.uk/ahp/improving-rehabilitation/> [Accessed 2 Oct 2021].
- NHS ENGLAND, 2023. *Supported self-management*. [online]. NHS England: Personalised Care. Available from: <https://www.england.nhs.uk/personalisedcare/supported-self-management/> [Accessed 15 Feb 2024].
- NHS ENGLAND CRG, 2020. Spinal Cord Injury Services (Adults and children). Available from: <https://www.england.nhs.uk/commissioning/spec-services/npc-crg/group-d/rehabilitation-and-disability/>.
- NHS HEALTH RESEARCH AUTHORITY, 2022. UK Policy Framework for Health and Social Care Research. Available from: <https://www.hra.nhs.uk/planning-and-improving-research/policies-standards-legislation/uk-policy-framework-health-social-care-research/uk-policy-framework-health-and-social-care-research/> [Accessed 14 Jul 2022].
- NICE, 2016a. Major trauma: assessment and initial management.
- NICE, 2016b. Major trauma: service delivery. Available from: <https://www.nice.org.uk/guidance/ng40> [Accessed 30 Aug 2021].
- NICE, 2018. Trauma: Quality standard [QS166]. Available from: <https://www.nice.org.uk/guidance/qs166> [Accessed 16 Dec 2023].
- NICE, 2022. Rehabilitation after traumatic injury.
- NORRIS, S. et al., 2023. Patient perspectives of recovery following major musculoskeletal trauma: A systematic review and qualitative synthesis. *Trauma*, p. 14604086231211995.
- NOYES, J. et al., 2019. Qualitative evidence. In: *Cochrane Handbook for Systematic Reviews of Interventions*. John Wiley & Sons, Ltd. pp. 525–545. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119536604.ch21> [Accessed 17 Feb 2024].
- OFFICE FOR HEALTH IMPROVEMENT & DISPARITIES, 2022. *Working definition of trauma-informed practice*. [online]. GOV.UK. Available from: <https://www.gov.uk/government/publications/working-definition-of-trauma-informed-practice/working-definition-of-trauma-informed-practice> [Accessed 20 Jan 2024].
- OGILVIE, R. et al., 2015. Young peoples' experience and self-management in the six months following major injury: A qualitative study. *Injury*, 46(9), pp. 1841–1847.
- OKADA, K. et al., 2020. Revision of 'golden hour' for hemodynamically unstable trauma patients: an analysis of nationwide hospital-based registry in Japan. *Trauma Surgery & Acute Care Open*, 5(1), p. e000405.
- OLIVE, P. et al., 2022. Psychological and psychosocial aspects of major trauma care in the United Kingdom: A scoping review of primary research. *Trauma*, p. 14604086221104934.
- OLIVER, D.G., SEROVICH, J.M. and MASON, T.L., 2005. Constraints and Opportunities with Interview Transcription: Towards Reflection in Qualitative Research. *Social Forces*, 84(2), pp. 1273–1289.

- OLMOS-VEGA, F.M. et al., 2022. A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical Teacher*, pp. 1–11.
- OM SYSTEM, 2022. Olympus Dictation Management System.
- ONG, B., WILSON, J.R. and HENZEL, M.K., 2020. Management of the Patient with Chronic Spinal Cord Injury. *The Medical Clinics of North America*, 104(2), pp. 263–278.
- O'REILLY, D. et al., 2013. Opportunities for improvement in the management of patients who die from haemorrhage after trauma. *The British Journal of Surgery*, 100(6), pp. 749–755.
- O'REILLY, M. and PARKER, N., 2013. 'Unsatisfactory Saturation': a critical exploration of the notion of saturated sample sizes in qualitative research. *Qualitative Research*, 13(2), pp. 190–197.
- ORTHOPAEDIC ASSOCIATES, 2018. *What Constitutes Orthopedic Trauma*. [online]. Orthopedics Associates. Available from: <https://www.oaidocs.com/2018/04/13/constitutes-orthopedic-trauma/> [Accessed 3 Oct 2021].
- OSLER, T., NELSON, L.S. and BEDRICK, E.J., 1999. Injury Severity Scoring. *Journal of Intensive Care Medicine*, 14(1), pp. 9–19.
- OXFORD ENGLISH DICTIONARY, 2023. *Trauma - definition*. [online]. Oxford English Dictionary. Available from: <https://www.oed.com/search/dictionary/?scope=Entries&q=trauma> [Accessed 20 Jan 2024].
- PAGE, M.J. et al., 2021a. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Systematic Reviews*, 10(1), p. 89.
- PAGE, M.J. et al., 2021b. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, 372(n71).
- PALMER, C.S., GABBE, B.J. and CAMERON, P.A., 2016. Defining major trauma using the 2008 Abbreviated Injury Scale. *Injury*, 47(1), pp. 109–115.
- PARENT, S. et al., 2011. The Impact of Specialized Centers of Care for Spinal Cord Injury on Length of Stay, Complications, and Mortality: A Systematic Review of the Literature. *Journal of Neurotrauma*, 28(8), pp. 1363–1370.
- PATTERSON, M.E. and WILLIAMS, D.R., 1998. Paradigms and problems: The practice of social science in natural resource management. *Society & Natural Resources*, 11(3), pp. 279–295.
- PEARSON, A. et al., 2005. The JBI model of evidence-based healthcare. *International Journal of Evidence-Based Healthcare*, 3(8), pp. 207–215.
- PETERS, M. et al., 2020. Chapter 11: Scoping reviews - JBI Manual for Evidence Synthesis. In: E. AROMATARIS and Z. MUNN, eds. *JBI Manual for Evidence Synthesis*. JBI. Available from: <https://synthesismanual.jbi.global> [Accessed 18 Oct 2021].
- POLINDER, S. et al., 2010. A systematic review of studies measuring health-related quality of life of general injury populations. *BMC Public Health*, 10(1), p. 783.
- POULTON A. et al., 2019. The impact of frailty on outcomes in adult trauma patients: A systematic review and meta-analysis. *Canadian Journal of Anesthesia*, 66(2 Supplement), pp. S187–S188.

- PUBLIC HEALTH SCOTLAND, 2020a. *STAG Annual Report 2020 - Part 1*. [online]. Tableau Software. Available from: <https://www.stag.scot.nhs.uk/Publications/dashboard-2020-part-1.html> [Accessed 6 Mar 2021].
- PUBLIC HEALTH SCOTLAND, 2020b. Scottish Trauma Audit Group (STAG) Inclusion/exclusion criteria. Available from: <https://www.stag.scot.nhs.uk/docs/2020/STAG-Inclusion-Exclusion-Criteria-V6-5-PHS.pdf?1> [Accessed 17 Dec 2023].
- PUBLIC HEALTH SCOTLAND, 2021a. *The Scottish Trauma Audit Group, STAG*. [online]. The Scottish Trauma Audit Group. Available from: <https://www.stag.scot.nhs.uk/PROMs/Main.htm> [Accessed 11 Sep 2021].
- PUBLIC HEALTH SCOTLAND, 2021b. *STAG Annual Report 2021*. [online]. Tableau Software. Available from: <https://www.publichealthscotland.scot/publications/audit-of-trauma-management-in-scotland/audit-of-trauma-management-in-scotland-reporting-on-2020/> [Accessed 17 Oct 2021].
- PUBLIC HEALTH SCOTLAND, 2022. Methodology: Scottish Trauma Audit Group. Available from: [https://www.stag.scot.nhs.uk/Data-Collection/\\_docs/STAG-Methodology-v1.2-2022-07-08.pdf](https://www.stag.scot.nhs.uk/Data-Collection/_docs/STAG-Methodology-v1.2-2022-07-08.pdf) [Accessed 17 Dec 2023].
- PUBLIC HEALTH SCOTLAND, 2023. *Dashboard - Audit of trauma management in Scotland - reporting on 2022 - Audit of trauma management in Scotland - Publications - Public Health Scotland*. [online]. Available from: <https://publichealthscotland.scot/publications/audit-of-trauma-management-in-scotland/audit-of-trauma-management-in-scotland-reporting-on-2022/dashboard/> [Accessed 24 Aug 2023].
- REEDER, S. et al., 2021. Long-term health and mobility of older adults following traumatic injury: a qualitative longitudinal study. *Disability and Rehabilitation*, pp. 1–11.
- RICHARDS, T., 2017. *Tessa Richards: Words that annoy, phrases that grate*. [online]. The BMJ. Available from: <https://blogs.bmj.com/bmj/2017/04/07/tessa-richards-words-that-annoy-phrases-that-grate/> [Accessed 10 Dec 2023].
- RICHMOND, T.S. et al., 2000. Journey towards recovery following physical trauma. *Journal of Advanced Nursing*, 32(6), pp. 1341–1347.
- RIGHT TO REHAB COALITION, 2020. Community Rehabilitation: Live Well for Longer. Available from: [https://www.csp.org.uk/system/files/publication\\_files/Right%20To%20Rehab%20Report%2C%20February%202020%20-%20web.pdf](https://www.csp.org.uk/system/files/publication_files/Right%20To%20Rehab%20Report%2C%20February%202020%20-%20web.pdf).
- RINGBURG, A.N. et al., 2011. Prevalence and Prognostic Factors of Disability After Major Trauma. *Journal of Trauma: Injury, Infection & Critical Care*, 70(4), pp. 916–922.
- RITCHIE, J. et al., 2014a. *Qualitative Research Practice*. 2nd ed. SAGE Publications, Inc. Available from: <https://uk.sagepub.com/en-gb/eur/qualitative-research-practice/book237434> [Accessed 13 Jul 2022].
- RITCHIE, J. et al., 2014b. *Qualitative research practice : a guide for social science students and researchers*. Second edition / edited by Jane Ritchie, Jane Lewis, Carol McNaughton Nicholls, Rachel Ormston. Los Angeles: SAGE.
- RITCHIE, J. and LEWIS, J., 2003. *Qualitative research practice: a guide for social science students and researchers*. 1st ed. London: SAGE.

- RITSCHHEL, M. et al., 2021. Assessment of patient-reported outcomes after polytrauma – instruments and methods: a systematic review. *BMJ Open*, 11(12), p. e050168.
- ROBERTS, T.T., LEONARD, G.R. and CEPELA, D.J., 2017. Classifications In Brief: American Spinal Injury Association (ASIA) Impairment Scale. *Clinical Orthopaedics and Related Research*, 475(5), pp. 1499–1504.
- ROBINSON, L.J. et al., 2020. Conceptualizing the key components of rehabilitation following major musculoskeletal trauma: A mixed methods service evaluation. *Journal of Evaluation in Clinical Practice*, 26(5), pp. 1436–1447.
- ROBINSON, O.C., 2014. Sampling in Interview-Based Qualitative Research: A Theoretical and Practical Guide. *Qualitative Research in Psychology*, 11(1), pp. 25–41.
- ROEPKE, A.M., 2015. Psychosocial interventions and posttraumatic growth: a meta-analysis. *Journal of Consulting and Clinical Psychology*, 83(1), pp. 129–142.
- ROSS, J. and ASHBY, N., 2016. Role of coordinators in national and international major trauma services, 24(8), pp. 22–25.
- RUSSELL, R.J. et al., 2011. The role of trauma scoring in developing trauma clinical governance in the Defence Medical Services. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 366(1562), pp. 171–191.
- SACKETT, D.L. et al., 1996. Evidence based medicine: what it is and what it isn't. *BMJ : British Medical Journal*, 312(7023), pp. 71–72.
- SALDAÑA, J., 2009. *The Coding Manual for Qualitative Researchers*. London: SAGE.
- SALIM, A. et al., 2023. Measuring long-term outcomes after injury: current issues and future directions. *Trauma Surgery & Acute Care Open*, 8(1), p. e001068.
- SAMOBOREC, S. et al., 2019. Biopsychosocial barriers affecting recovery after a minor transport-related injury: A qualitative study from Victoria. *Health Expectations*, 22(5), pp. 1003–1012.
- SANDSTROM, L. et al., 2019. *The trauma continuum Experiences from injured persons and critical care nurses*. Available from: <http://urn.kb.se/resolve?urn=urn:nbn:se:ltu:diva-73253> [Accessed 26 Jun 2022].
- SANKI, M. and O'CONNOR, S.A., 2021. Developing an understanding of Post Traumatic Growth: Implications and application for research and intervention. *International Journal of Wellbeing*, 11(2), pp. 1–19.
- SAUNDERS, M.N.K., LEWIS, P. and THORNHILL, A., 2023. *Research methods for business students*. Ninth edition. Harlow, England: Pearson.
- SAUNDERS, M., LEWIS, P. and THORNHILL, A., 2007. *Research Methods for Business Students*. 4th ed. Edinburgh Gate, Harlow: Financial Times Prentice Hall.
- SCOTTISH GOVERNMENT, 2020. The Scottish Index of Multiple Deprivation 2020.
- SCOTTISH GOVERNMENT, 2022a. Rehabilitation and Recovery: A Once for Scotland Person-Centred Approach to Rehabilitation in a Post-COVID Era.

- SCOTTISH GOVERNMENT, 2022b. *Scottish Government Urban Rural Classification 2020*. Scottish Government.
- SCOTTISH TRAUMA NETWORK, 2018a. Scottish Trauma Network: National Implementation Plan. Available from: <https://www.scottishtraumanetwork.com/wp-content/uploads/2018/06/STN-National-Implementation-Plan.pdf>.
- SCOTTISH TRAUMA NETWORK, 2018b. Scottish Trauma Network: National Implementation Plan. Available from: <https://www.scottishtraumanetwork.com/wp-content/uploads/2018/06/STN-National-Implementation-Plan.pdf>.
- SCOTTISH TRAUMA NETWORK, 2021. *Scottish Trauma Network | North of Scotland*. [online]. Scottish Trauma Network. Available from: <https://www.scottishtraumanetwork.com/regions/north-of-scotland/> [Accessed 17 Oct 2021].
- SHARP, V.L. et al., 2023. Perspectives of major traumatic injury survivors on accessibility and quality of rehabilitation services in rural Australia. *Disability and Rehabilitation*, 45(8), pp. 1379–1388.
- SHEPHERD-BANIGAN, M.E. et al., 2018. Interventions That Support or Involve Caregivers or Families of Patients with Traumatic Injury: a Systematic Review. *JGIM: Journal of General Internal Medicine*, 33(7), pp. 1177–1186.
- SHINER, C.T. et al., 2021. Assessing unmet rehabilitation needs and the feasibility of a telehealth rehabilitation consultation service for road trauma survivors recently discharged from hospital. *Disability and Rehabilitation*, 0(0), pp. 1–10.
- SIEBERT, H., 2006. Weissbuch Schwerverletzten-Versorgung der DGU. Empfehlungen zur Struktur, Organisation und Ausstattung stationärer Einrichtungen zur Schwerverletzten-Versorgung in der Bundesrepublik Deutschland [White book of severely injured - care of the DGU. Recommendations on structure, organization and provision of hospital equipment for care of severely injured in the Federal Republic of Germany]. *Der Unfallchirurg*, 109(9), pp. 815–820.
- SIGN, 2013. SIGN 130 • Brain injury rehabilitation in adults. Available from: <https://www.sign.ac.uk>.
- SILVERIO, S.A. et al., 2022. Sensitive, Challenging, and Difficult Topics: Experiences and Practical Considerations for Qualitative Researchers. *International Journal of Qualitative Methods*, 21, p. 16094069221124739.
- SILVERSTEIN, L.A., HIGGINS, J.T. and HENDERSON, S., 2021. Health-related quality of life after polytrauma: A systematic review. *Journal of Trauma Nursing*, 28(2), pp. 107–118.
- SILVESTER, L., TROMPETER, A. and HING, C., 2021. Patient experiences of rehabilitation following traumatic complex musculoskeletal injury – A mixed methods pilot study. *Trauma*, p. 1460408620988123.
- SILVESTER, L.A., 2011. Major trauma: a Lean approach to process design. *British Journal of Healthcare Management*, 17(10), pp. 486–495.
- SLENEY, J. et al., 2014. Improving recovery—Learning from patients’ experiences after injury: A qualitative study. *Injury*, 45(1), pp. 312–319.
- VAN DER SLUIS, C.K. et al., 1998. Long-term physical, psychological and social consequences of severe injuries. *Injury*, 29(4), pp. 281–285.

- SMITH, E. et al., 2023. Vicarious Trauma: Exploring the Experiences of Qualitative Researchers Who Study Traumatized Populations. *Disaster Medicine and Public Health Preparedness*, 17, p. e69.
- SMITH, J.A. and OSBORN, M., 2007. Chapter 4: Interpretative Phenomenological Analysis. In: *Qualitative Psychology - a Practical Guide to Research Methods*. London, Thousand Oaks, New Delhi.: SAGE Publications Ltd. pp. 53–80.
- SMITH-RYAN, A.E. et al., 2020. Nutritional Considerations and Strategies to Facilitate Injury Recovery and Rehabilitation. *Journal of Athletic Training*, 55(9), pp. 918–930.
- SOKAS, C.M. et al., 2023. The Trauma Dyad: The Role of Informal Caregivers for Older Adults After Traumatic Injury. *Annals of Surgery*, 277(4), pp. e907–e913.
- SPREADBOROUGH, S. et al., 2018. A study of outcomes of patients treated at a UK major trauma centre for moderate or severe injuries one to three years after injury. *Clinical Rehabilitation*, 32(3), pp. 410–418.
- STABLES, L., 2021. The Impact of Covid 19 on the Major Trauma Patient Rehabilitation Pathway [Unpublished audit].
- STEVENSON, M. et al., 2001. An overview of the injury severity score and the new injury severity score. *Injury Prevention*, 7(1), pp. 10–13.
- TAMURA, N., KURIYAMA, A. and KAIHARA, T., 2019. Health-related quality of life in trauma patients at 12 months after injury: a prospective cohort study. *European Journal of Trauma and Emergency Surgery*, 45(6), pp. 1107–1113.
- TAYLOR, H. et al., 2022. The changing workplace: Enabling disability-inclusive hybrid working. *Work Foundation, Lancaster University.*, pp. 1–27.
- TEAGUE, S. et al., 2018. Retention strategies in longitudinal cohort studies: a systematic review and meta-analysis. *BMC Medical Research Methodology*, 18(1), p. 151.
- TEDESCHI, R.G. et al., 2018. *Posttraumatic Growth: Theory, Research, and Applications*. Routledge.
- THE ASSOCIATION FOR THE ADVANCEMENT OF AUTOMOTIVE MEDICINE, 2016. *Abbreviated Injury Scale (AIS) 2015*. Chicago, IL.: The Association for the Advancement of Automotive Medicine.
- THE TRAUMA AUDIT & RESEARCH NETWORK, 2020. The Trauma Audit & Research Network Procedures Manual. Available from: <https://www.c4ts.qmul.ac.uk/downloads/procedures-manual-tarn-p13-iss.pdf> [Accessed 11 Feb 2024].
- THOMPSON, L. et al., 2021. Defining major trauma: a Delphi study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 29(1), p. 63.
- THOMPSON, L., HILL, M. and SHAW, G., 2019. Defining major trauma: a literature review. *British Paramedic Journal*, 4(1), pp. 22–30.
- THORNE, S.E., 2016. *Interpretive description: qualitative research for applied practice*. Second edition. London: Routledge.
- TIPTON, K.D., 2015. Nutritional Support for Exercise-Induced Injuries. *Sports Medicine*, 45(1), pp. 93–104.



- TOHIRA, H. et al., 2012. Systematic review of predictive performance of injury severity scoring tools. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 20(1), p. 63.
- TRAUMA REGISTRY INFORMATION SPECIALISTS OF CANADA, 2016. Injury Surveillance and Trauma Registry Information Management Orientation Manual. Available from: <https://www.traumacanada.org/wp-content/uploads/2017/10/InjurySurveillanceManual2016-2.pdf> [Accessed 11 Feb 2024].
- TREDE, R.-D. et al., 2019. Chronic pain as a symptom or a disease: the IASP Classification of Chronic Pain for the International Classification of Diseases (ICD-11). *Pain*, 160(1), pp. 19–27.
- TRICCO, A.C. et al., 2016. A scoping review on the conduct and reporting of scoping reviews. *BMC Medical Research Methodology*, 16(1), p. 15.
- TUFANARU, C. et al., 2017. Systematic reviews of effectiveness. In: *Joanna Briggs Institute Reviewer's Manual*. The Joanna Briggs Institute Adelaide, Australia. pp. 3–10.
- TURK, A., BOYLAN and LOCOCK, 2016. A Researcher's Guide to Patient and Public Involvement.
- TURNER, M., 2023. *UC Library Guides: Evidence-Based Practice in Health: Hierarchy of Evidence*. [online]. Available from: <https://canberra.libguides.com/c.php?g=599346&p=4149721> [Accessed 21 Jan 2024].
- TURNER-STOKES, L. et al., 2015. Multi-disciplinary rehabilitation for acquired brain injury in adults of working age. *Cochrane Database of Systematic Reviews*, (12). [online]. Available from: <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004170.pub3/full> [Accessed 5 Feb 2024].
- TURNER-STOKES, L., 2018. Specialist Rehabilitation in the Trauma pathway: BSRM core standards. Available from: <https://www.bsrm.org.uk/downloads/bsrm-core-standards-for-major-trauma-19.11.2018-clean-for-web.pdf> [Accessed 24 Sep 2021].
- UK PUBLIC INVOLVEMENT STANDARDS DEVELOPMENT PARTNERSHIP, 2019. *UK Standards for Public Involvement*. NIHR Central Commissioning Facility. Available from: <https://sites.google.com/nihr.ac.uk/pi-standards/home> [Accessed 30 Apr 2024].
- UNITED NATIONS DEVELOPMENT PROGRAMME, ed., 2020. *The next frontier: human development and the Anthropocene*. New York, NY: United Nations Development Programme.
- ÜZÜMCÜOĞLU, Y. et al., 2016. Life quality and rehabilitation after a road traffic crash: A literature review. *Transportation Research Part F: Traffic Psychology and Behaviour*, 40, pp. 1–13.
- VAN BEECK, E.F. et al., 2007. Guidelines for the Conduction of Follow-up Studies Measuring Injury-Related Disability. *Journal of Trauma: Injury, Infection & Critical Care*, 62(2), pp. 534–550.
- VETERANS HEALTH ADMINISTRATION, 2024. *VA.gov | Veterans Affairs*. [online]. Available from: <https://www.va.gov/health/> [Accessed 19 Feb 2024].
- VISSER, E. et al., 2017. The course, prediction, and treatment of acute and posttraumatic stress in trauma patients: A systematic review. *JOURNAL OF TRAUMA AND ACUTE CARE SURGERY*, 82(6), pp. 1158–1183.

- VISSER, E. et al., 2021. Patients' experiences and wellbeing after injury: A focus group study. *PLOS ONE*, 16(1), p. e0245198.
- VOS, T. et al., 2020. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, 396(10258), pp. 1204–1222.
- WAKE E. et al., 2022. Follow-up of severely injured patients can be embedded in routine hospital care: results from a feasibility study. *Hospital Practice (1995)*, 50(2), pp. 138–150.
- WAKE, E. et al., 2020. Telehealth in trauma: A scoping review. *Journal of Telemedicine and Telecare*, p. 1357633X20940868.
- WAKE, E. et al., 2021. *Barriers and Facilitators to Implementation of a Telephone Follow-Up Program for Severely Injured Trauma Patients – A Process Evaluation*. In Review. Available from: <https://www.researchsquare.com/article/rs-722754/v1> [Accessed 26 Jun 2022].
- WALSH, R., 2003. The methods of reflexivity. *The Humanistic Psychologist*, 31(4), pp. 51–66.
- WARREN, K.-R.J. et al., 2019. The overview of the Australian trauma system. *OTA International*, 2(S1), p. e018.
- WELDRING, T. and SMITH, S.M.S., 2013. Patient-Reported Outcomes (PROs) and Patient-Reported Outcome Measures (PROMs). *Health Services Insights*, 6, pp. 61–68.
- WILKES, L., CUMMINGS, J. and HAIGH, C., 2015. Transcriptionist saturation: knowing too much about sensitive health and social data. *Journal of Advanced Nursing*, 71(2), pp. 295–303.
- WILSON, L. et al., 2017. The chronic and evolving neurological consequences of traumatic brain injury. *The Lancet Neurology*, 16(10), pp. 813–825.
- WORLD HEALTH ORGANIZATION, 2002. Towards a Common Language for Functioning, Disability and Health. Available from: <https://www.who.int/publications/m/item/icf-beginner-s-guide-towards-a-common-language-for-functioning-disability-and-health> [Accessed 19 May 2022].
- WORLD HEALTH ORGANIZATION, 2013. *Strengthening road safety legislation: a practice and resource manual for countries*. Geneva: World Health Organization. Available from: <https://iris.who.int/handle/10665/85396> [Accessed 7 Feb 2024].
- WORLD HEALTH ORGANIZATION, 2021. *Rehabilitation*. [online]. World Health Organization. Available from: <https://www.who.int/news-room/fact-sheets/detail/rehabilitation> [Accessed 9 May 2022].
- WORLD HEALTH ORGANIZATION, 2023. *ICD-11 for Mortality and Morbidity Statistics*. [online]. Available from: <https://icd.who.int/browse11/l-m/en> [Accessed 20 Jan 2024].
- WORLD HEALTH ORGANIZATION, 2024. *Health literacy - Health Promotion*. [online]. World Health Organization. Available from: <https://www.who.int/teams/health-promotion/enhanced-wellbeing/ninth-global-conference/health-literacy> [Accessed 14 Feb 2024].
- WORLD MEDICAL ASSOCIATION, 2013. Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects. Available from: <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/> [Accessed 5 Aug 2023].

- WYATT, J., 2004. *20 years of NICE*. [online]. National Institute for Health and Care Excellence. Available from: <https://www.nice.org.uk/News/Article/20-years-of-nice> [Accessed 10 Jan 2024].
- YANG, L.J.-S. and CHUNG, K.C., 2012. CHAPTER 2 - Physiology of nerve injury and regeneration. In: K.C. CHUNG, L.J.-S. YANG and J.E. MCGILLICUDDY, eds. *Practical Management of Pediatric and Adult Brachial Plexus Palsies*. Philadelphia: W.B. Saunders. pp. 13–20. Available from: <https://www.sciencedirect.com/science/article/pii/B9781437705751000022> [Accessed 5 Feb 2024].
- ZANGARI, R., GRITTI, P. and BIROLI, F., 2022. Chapter 2 - Predictors of outcome in moderate and severe traumatic brain injury. In: R. RAJENDRAM, V.R. PREEDY and C.R. MARTIN, eds. *Diagnosis and Treatment of Traumatic Brain Injury*. Academic Press. pp. 15–26. Available from: <https://www.sciencedirect.com/science/article/pii/B9780128233474000014> [Accessed 30 Jan 2024].
- ZIRAN, B.H., BARRETTE-GRISCHOW, M.-K. and HULL, T., 2009. Hidden burdens of orthopedic injury care: the lost providers. *The Journal of Trauma*, 66(2), pp. 536–549.

## APPENDIX

## APPENDIX A – PRISMA Checklist for Qualitative Systematic Reviews

Section and Topic	Item #	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	N/A
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	N/A
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	42
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	42
<b>METHODS</b>			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	43
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	46
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	274
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	47
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	48
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	48
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	52
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	48
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	-
Synthesis	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention	49

Section and Topic	Item #	Checklist item	Location where item is reported
methods		characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	49
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	-
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	49
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	-
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	-
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	-
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	77
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	52
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	281
Study characteristics	17	Cite each included study and present its characteristics.	56
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	78
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	-
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	-
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	-
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	82
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	-
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	-

Section and Topic	Item #	Checklist item	Location where item is reported
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	78
<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	79
	23b	Discuss any limitations of the evidence included in the review.	82
	23c	Discuss any limitations of the review processes used.	82
	23d	Discuss implications of the results for practice, policy, and future research.	84
<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	45
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	45
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	50
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	-
Competing interests	26	Declare any competing interests of review authors.	-
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	-

**APPENDIX B – General Search Strategy Terms**

General search strategy for initial searches of MEDLINE and CINAHL

<b>Search #</b>	<b>Search Terms</b>
1	AB (qualitative OR "patient* experience" OR "patient* perspective") OR TI (qualitative OR "patient* experience" OR "patient* perspective") OR (MH "Qualitative Research") OR TX "thematic analysis"
2	(TX "major trauma" OR "multiple trauma" OR "multiple trauma*" OR polytrauma OR "poly trauma" OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*") OR (MM "Multiple Trauma/RH/TH")
3	( AB (qualitative OR "patient* experience" OR "patient* perspective") OR TI (qualitative OR "patient* experience" OR "patient* perspective") OR (MH "Qualitative Research") OR TX "thematic analysis" )
	AND
	( (TX "major trauma" OR "multiple trauma" OR "multiple trauma*" OR polytrauma OR "poly trauma" OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*") OR (MM "Multiple Trauma/RH/TH") )

## APPENDIX C – Search Strategies

### Database Searches

Database: CINAHL with Full Text (via EBSCOhost)		Date Search Run: 21 April 2023
Search	Query	Records Retrieved
#1	(TX "major trauma" OR "multiple trauma*" OR polytrauma OR "poly trauma" OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*") OR (MM "Multiple Trauma/RH/TH")  Date range: 01 January 2000 – 31 June 2022	13,948
#2	( AB qualitative OR "patient* experience" OR "patient* perspective" OR interview*) OR ( TI qualitative OR "patient* experience" OR "patient* perspective") OR (MH "Qualitative Studies") OR (MH "Phenomenology") OR (MH "Thematic Analysis") OR (MH "Interviews")  Date range: 01 January 2000 – 31 June 2022	459,697
#3	#1 AND #2  ( ( AB qualitative OR "patient* experience" OR "patient* perspective" OR interview*) OR ( TI qualitative OR "patient* experience" OR "patient* perspective") OR (MH "Qualitative Studies") OR (MH "Phenomenology") OR (MH "Thematic Analysis") OR (MH "Interviews") )  AND ( (TX "major trauma" OR "multiple trauma*" OR polytrauma OR "poly trauma" OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*") OR (MM "Multiple Trauma/RH/TH") )  Date range: 01 January 2000 – 31 June 2022	697
Abbreviations: AB – abstract, MH – exact subject heading, MM – exact major subject heading, RH - rehabilitation, TH -therapy, TI – title, TX – all text.		



Database: MEDLINE (via EBSCOhost)		Date Search Run: 21 April 2023
Search	Query	Records Retrieved
#1	(TX "major trauma" OR "multiple trauma*" OR polytrauma OR "poly trauma" OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*") OR (MM "Multiple Trauma/RH/TH")  Date range: 01 January 2000 – 31 June 2022	41,159
#2	( AB qualitative OR "patient* experience" OR "patient* perspective" OR interview*) OR ( TI qualitative OR "patient* experience" OR "patient* perspective") OR (MH "Qualitative Research") OR (TX "thematic analysis")  Date range: 01 January 2000 – 31 June 2022	597,632
#3	#1 AND #2  ( (TX "major trauma" OR "multiple trauma*" OR polytrauma OR "poly trauma" OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*") OR (MM "Multiple Trauma/RH/TH") )  AND ( ( AB qualitative OR "patient* experience" OR "patient* perspective" OR interview*) OR ( TI qualitative OR "patient* experience" OR "patient* perspective") OR (MH "Qualitative Research") OR (TX "thematic analysis") )  Date range: 01 January 2000 – 31 June 2022	<b>1,100</b>
Abbreviations: AB – abstract, MH – exact subject heading, MM – exact major subject heading, RH - rehabilitation, TH -therapy, TI – title, TX – all text.		

Database: SPORTDiscus with Full text (via EBSCOhost)		Date Search Run: 21 April 2023
Search	Query	Records Retrieved
#1	(TX "major trauma" OR "multiple trauma*" OR polytrauma OR "orthop*dic trauma" OR "traumatic injur*" OR "multiple injur*")  Date range: 01 January 2000 – 31 June 2022	7,990
#2	( AB qualitative OR "patient* experience" OR "patient* perspective" OR interviews) OR ( TI qualitative OR "patient* experience" OR "patient* perspective")  Date range: 01 January 2000 – 31 June 2022	63,374
#3	#1 AND #2  ( (TX "major trauma" OR "multiple trauma*" OR polytrauma OR "orthop*dic trauma" OR "traumatic injur*" OR "multiple injur*") )  AND ( ( AB qualitative OR "patient* experience" OR "patient* perspective" OR interviews) OR ( TI qualitative OR "patient* experience" OR "patient* perspective") )  Date range: 01 January 2000 – 31 June 2022	160
Abbreviations: AB – abstract, TI – title, TX – all text.		

Database: Embase (via Ovid)		Date Search Run: 21 April 2023
Search	Query	Records Retrieved
#1	(major trauma or multiple trauma* or polytrauma or orthop?edic trauma or severe trauma or blunt thoracic trauma or traumatic injur* or multiple injur*).mp. or injury/rh, th	60,947
#2	qualitative research/ or patient* experience.mp. or patient* perspective.mp. or thematic analysis/ or semi structured interview/ or unstructured interview/	193,163
#3	#1 AND #2  Date range: 2000 – 2022	439
Abbreviations: .mp. – searches title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword; rh – rehabilitation; th – therapy; / – subject heading		

Database: Web of Science (via Clarivate)		Date Search Run: 21 April 2023
Search	Query	Records Retrieved
#1	<p>ALL=("major trauma" OR "multiple trauma*" OR polytrauma OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*")</p> <p>Date range: 01 January 2000 – 01 June 2022</p>	33,916
#2	<p>TS=(qualitative OR "patient* experience" OR "patient* perspective")</p> <p>Date range: 01 January 2000 – 01 June 2022</p>	642,883
#3	<p>#1 AND #2</p> <p>(ALL=("major trauma" OR "multiple trauma*" OR polytrauma OR "orthop*dic trauma" OR "moderate trauma" OR "severe trauma" OR "blunt thoracic injur*" OR "traumatic injur*" OR "multiple injur*"))</p> <p>AND TS=(qualitative OR "patient* experience" OR "patient* perspective")</p> <p>Date range: 01 January 2000 – 01 June 2022</p>	451
<p>Abbreviations: ALL – all fields searched, TS – Topic (searches title, abstract, author keywords, Keywords Plus®).</p> <p>(Web of Science Core Collection searched)</p>		

Grey Literature Searches

<b>Source: Google Search Engine – Original search</b>		<b>Date Search Run: 26 June 2022</b>			
<b>Search #</b>	<b>Search query</b>	<b>Total # results</b>	<b># results screened</b>	<b># potentially relevant records</b>	<b>Total # records</b>
#1	"major trauma" AND "recovery" AND patient experience OR patient perspective AND filetype:pdf	~ 67,800	131	15	15
#2	"multiple trauma" AND "recovery" AND patient experience OR patient perspective AND filetype:pdf	~ 29,500	150	10	25
#3	"traumatic injury" AND "recovery" AND patient experience OR patient perspective AND filetype:pdf	~ 82,100	133	23	48
Notes: used incognito mode; searches “all results”; screened first 15 pages of results; relevant hits were uploaded to Covidence to be screened for inclusion in review; filetype:pdf was used to focus results on pdf documents.					<b>32</b> (16 duplicates removed)

<b>Source: Google Search Engine - Updated</b>		<b>Date Search Run: 27 April 2023</b>			
<b>Search #</b>	<b>Search query</b>	<b>Total # results</b>	<b># results screened</b>	<b># potentially relevant records</b>	<b>Total # records</b>
#1	"major trauma" AND "recovery" AND patient experience OR patient perspective AND filetype:pdf  Date range: 27 Jun 2022 – 27 Apr 2023	189	150	0	0
#2	"multiple trauma" AND "recovery" AND patient experience OR patient perspective AND filetype:pdf  Date range: 27 Jun 2022 – 27 Apr 2023	103	103	0	0
#3	"traumatic injury" AND "recovery" AND patient experience OR patient perspective AND filetype:pdf  Date range: 27 Jun 2022 – 27 Apr 2023	<b>176</b>	150	0	0
Notes: used incognito mode; searches “all results”; Date range: 27 Jun 2022 – 27 Apr 2023; screened first 15 pages of results (150); filetype:pdf was used to focus results on pdf documents.					0

Source: Networked Digital Library of Theses and Dissertations		Date Search Run: 27 April 2023		
Search #	Search query	Total # results	# potentially relevant records	Total # records
#1	"major trauma" OR "multiple trauma" OR "traumatic injury" AND recovery	43	0	0
Notes: used NDLTD Global ETD (electronic thesis and dissertation) Search engine.				

Source: EBSCO Open Dissertations		Date Search Run: 27 April 2023		
Search #	Search query	Total # results	# potentially relevant records	Total # records
#1	"major trauma" OR "multiple trauma" OR "traumatic injury" AND recovery	91	0	0
Notes: accessed through EBSCOhost search engine, expanders – “apply equivalent subjects” used.				

Source: The King’s Fund		Date Search Run: 27 April 2023		
Search #	Search query	Total # results	# potentially relevant records	Total # records
#1	major trauma	6	0	0
#2	multiple trauma	3	0	0
#3	traumatic injury	1	0	0
Notes: “All publications” searched.				

Source: National Audit Office		Date Search Run: 27 April 2023		
Search #	Search query	Total # results	# potentially relevant records	Total # records
#1	major trauma	3	0	0
#2	multiple trauma	1	0	0
#3	traumatic injury	0	0	0
Notes: Used “Publications” search engine on National Audit Office website.				

Source: British Trauma Society		Date Search Run: 27 April 2023		
Search #	Search query	Total # results	# potentially relevant records	Total # records
#1	major trauma	123	0	0
#2	multiple trauma	45	0	0
#3	traumatic injury	29	0	0

Notes: Conducted sitewide search for above terms on the *British Orthopaedic Association* (host of the British Trauma Society).

Source: Centre for Trauma Sciences		Date Search Run: 27 April 2023		
Search #	Search query	Total # results	# potentially relevant records	Total # records
#1	qualitative research	10	0	0

Notes: Search query searched in sitewide search engine; hand searched the Research, International Trauma Research Network (INTRN), and National Trauma Research and Innovation Collaborative (NaTRIC) Studies pages.

Other Sources	Date Search Run: 27 April 2023
TraumaCare	No search engine for site or publications/research page (no research/reference to research on website).
British Society of Rehabilitation Medicine	Hand searched the Publication and Research/Audit pages (standards and guidelines, so not relevant), Hand searched the "News & Articles" area (Publications – 23, research outputs – 15, research - 8)

**APPENDIX D – Studies Ineligible Following Full Text Review**

List of excluded studies with reasons for exclusion

1. Airey CM, Chell SM, Rigby AS, Tennant A, Connelly JB. The epidemiology of disability and occupation handicap resulting from major traumatic injury. *Disability & Rehabilitation*. 2001;23(12):509–15.

*Reason for exclusion:* Ineligible study design

2. Aitken LM, Chaboyer W, Jeffrey C, Martin B, Whitty JA, Schuetz M, et al. Indicators of injury recovery identified by patients, family members and clinicians. *Injury*. 2016;47(12):2655–63.

*Reason for exclusion:* Ineligible participant population

3. Brand R.M., Chisholm K., Terhaag S., Lau W., Forbes D., Holmes A., et al. Understanding the early support needs of survivors of traumatic events: The example of severe injury survivors. *Psychol Trauma*. 2018;10(3):376–85.

*Reason for exclusion:* Ineligible participant population

4. Bridger K., Kellezi B., Kendrick D., Radford K., Timmons S., Rennoldson M., et al. Patient perspectives on key outcomes for vocational rehabilitation interventions following traumatic injury. *Int J Environ Res Public Health*. 2021;18(4):1–15.

*Reason for exclusion:* Unclear participant population

5. Brown K., Cameron I.D., Keay L., Nguyen H., Dillon L., Jagnoor J., et al. 'I've got to be independent': views of older people on recovery following road traffic injury in New South Wales, Australia. *BMC Public Health*. 2020;20(1):1294.

*Reason for exclusion:* Ineligible participant population

6. Bruce MM, Ulrich CM, Webster J, Richmond TS. Injured black men's perceptions of the recovery environment. *Social science & medicine (1982)*. 2022;292:114608.

*Reason for exclusion:* Ineligible participant population

7. BUDDAI S. et al., 2017. Characterizing intensive care unit patient and family experiences of recovery after traumatic injury. *American Journal of Respiratory and Critical Care Medicine*, 195(University of Pennsylvania, Perelman School of Medicine, Philadelphia, PA, United States). [online]. Available from: <http://www.atsjournals.org/doi/pdf/10.1164/ajrccm-conference.2017.195.1-MeetingAbstracts.A1437>.

*Reason for exclusion:* Ineligible study design

8. Claydon J., Maniatopoulos G., Robinson L., Fearon P. Traumatic multiple rib fractures: Key health outcomes influencing rehabilitation and recovery from a patient perspective. *Physiotherapy*. 2017;103(Supplement 1):e142–3.

*Reason for exclusion:* Ineligible study design

9. Claydon J, Maniatopoulos G, Robinson L, Fearon P. Challenges experienced during rehabilitation after traumatic multiple rib fractures: a qualitative study. *Disability & Rehabilitation*. 2018;40(23):2780–9.

*Reason for exclusion:* Unclear participant population

10. Crandall M, Kools S, Miaskowski C, Savedra M. Adolescents' pain experiences following acute blunt traumatic injury: struggle for internal control. *Journal for Specialists in Pediatric Nursing*. 2007;12(4):224–37.

*Reason for exclusion:* Ineligible phenomena of interest

11. Dewar A. Protecting strategies used by sufferers of catastrophic illnesses and injuries. *Journal of clinical nursing*. 2001;10(5):600–8.

*Reason for exclusion:* Ineligible participant population

12. Duchin ER, Neisinger L, Reed MJ, Gause E, Sharninghausen J, Pham T. Perspectives on recovery from older adult trauma survivors living in rural areas. *Trauma surgery & acute care open*. 2022;7(1):e000881.

*Reason for exclusion:* Ineligible participant population

13. Englund L, Forsberg R, Saveman BI. Survivors' experiences of media coverage after traumatic injury events. *International Emergency Nursing*. 2014;22(1):25–30.

*Reason for exclusion:* Ineligible phenomena of interest

14. Finstad J, Røise O, Rosseland LA, Clausen T, Havnes IA. Discharge from the trauma centre: exposure to opioids, unmet information needs and lack of follow up-a qualitative study among physical trauma survivors. *Scandinavian journal of trauma, resuscitation and emergency medicine*. 2021;29(1):121.

*Reason for exclusion:* Unclear participant population

15. Franzen C., Bjornstig U., Jansson L. Injured in traffic: Experiences of care and rehabilitation. *Accid Emerg Nurs*. 2006;14(2):104–10.

*Reason for exclusion:* Ineligible participant population

16. Gabbe BJ, Sleney JS, Gosling CM, Wilson K, Hart MJ, Sutherland AM, et al. Patient perspectives of care in a regionalised trauma system: lessons from the Victorian State Trauma System. *Medical Journal of Australia*. 2013;198(3):149–52.

*Reason for exclusion:* Ineligible participant population

17. Gabbe BJ, Sleney JS, Gosling CM, Wilson K, Sutherland A, Hart M, et al. Financial and employment impacts of serious injury: a qualitative study. *Injury*. 2014;45(9):1445–51.

*Reason for exclusion:* Ineligible participant population

18. Gabbe BJ, Sutherland AM, Williamson OD, Cameron PA. Use of health care services 6 months following major trauma. *Australian Health Review*. 2007;31(4):628–32.

*Reason for exclusion:* Ineligible study design

19. Goldsmith H, McCloughen A, Curtis K. The experience and understanding of pain management in recently discharged adult trauma patients: A qualitative study. *INJURY-INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED*. 2018;49(1):110–6.

*Reason for exclusion:* Ineligible study design

20. Goldsmith H, McCloughen A, Curtis K. Using the trauma patient experience and evaluation of hospital discharge practices to inform practice change: A mixed methods study. *JOURNAL OF CLINICAL NURSING*. 2018;27(7–8):1589–98.



*Reason for exclusion:* Ineligible participant population

21. Gray C, Cole M, Mein G. Occupational therapy: a vital role in rehabilitation with patients having a circular frame. *British Journal of Occupational Therapy*. 2016;79:32–32.

*Reason for exclusion:* Ineligible study design

22. Grzelak S, Bérubé M, Gagnon MA, Côté C, Turcotte V, Pelet S, et al. Pain Management Strategies After Orthopaedic Trauma: A Mixed-Methods Study with a View to Optimizing Practices. *Journal of pain research*. 2022;15:385–402.

*Reason for exclusion:* Ineligible participant population

23. Halpin SJ, Rakotonirainy R, Chamberlain MA, O'Connor RJ. Trauma rehabilitation in a teaching hospital in Antananarivo, Madagascar: current provision and patients' perspectives. *Disability & Rehabilitation*. 2020;42(13):1863–9.

*Reason for exclusion:* Ineligible context/HDI

24. Hasselberg M., Kirsebom M., Backstrom J., Berg H.-Y., Rissanen R. I did NOT feel like this at all before the accident: do men and women report different health and life consequences of a road traffic injury? *Inj Prev*. 2019;25(4):307–12.

*Reason for exclusion:* Ineligible study design

25. Jackson A, Curtin E, Giddins E, Read-Allsopp C, Joseph A. Connecting With Trauma Patients After Discharge: A Phone Call Follow-Up Study. *Journal of Trauma Nursing*. 2021;28(3):179–85.

*Reason for exclusion:* Ineligible study design

26. Jacoby SF, Rich JA, Webster JL, Richmond TS. "Sharing things with people that I don't even know": help-seeking for psychological symptoms in injured Black men in Philadelphia. *Ethnicity & Health*. 2020;25(6):777–95.

*Reason for exclusion:* Ineligible participant population

27. James A, Tran VT, Gauss T, Hamada S, Roquet F, Bitot V, et al. Important Issues to Severe Trauma Survivors: A Qualitative Study. *Annals of surgery*. 2022;275(1):189–95.

*Reason for exclusion:* Unable to extract relevant data

28. Jiang T, Webster JL, Robinson A, Kassam-Adams N, Richmond TS. Emotional responses to unintentional and intentional traumatic injuries among urban black men: A qualitative study. *Injury*. 2018;49(5):983–9.

*Reason for exclusion:* Ineligible participant population

29. Katsarelis H, Mason S, Turner J, Nicholl J. Self-reported physical and mental functioning up to 15 years after traumatic injury: comparison with population norms. *Emergency Medicine Journal*. 2009;26:4–4.

*Reason for exclusion:* Ineligible study design

30. Kettlewell J, Radford K, Kendrick D, Patel P, Bridger K, Kellezi B, et al. Qualitative study exploring factors affecting the implementation of a vocational rehabilitation intervention in the UK major trauma pathway. *BMJ open*. 2022;12(3):e060294.

*Reason for exclusion:* Ineligible participant population

31. Kettlewell J, Timmons S, Bridger K, Kendrick D, Kellezi B, Holmes J, et al. A study of mapping usual care and unmet need for vocational rehabilitation and psychological support following major trauma in five health districts in the UK. *Clinical Rehabilitation*. 2021;35(5):750–64.

*Reason for exclusion:* Ineligible participant population

32. Kimmel LA, Holland AE, Hart MJ, Edwards ER, Page RS, Hau R, et al. Discharge from the acute hospital: trauma patients' perceptions of care. *Australian Health Review*. 2016;40(6):625–32.

*Reason for exclusion:* Unclear participant population

33. Kingston GA, Judd DJ, Gray MA. The experience of living with a traumatic hand injury in a rural and remote location: an interpretive phenomenological study. *Rural and remote health*. 2014;14(3):2764.

*Reason for exclusion:* Ineligible participant population

34. Kingston GA, Judd J, Gray MA. The experience of medical and rehabilitation intervention for traumatic hand injuries in rural and remote North Queensland: a qualitative study. *Disability & Rehabilitation*. 2015;37(5):423–9.

*Reason for exclusion:* Ineligible participant population

35. Koizia L, Kings R, Koizia A, Peck G, Wilson M, Hettiaratchy S, et al. Major trauma in the elderly: Frailty decline and patient experience after injury. *Trauma*. 2019;21(1):21–6.

*Reason for exclusion:* Ineligible phenomena of interest

36. Kralik D. Physically injured patients described several forms of post-traumatic concerns. *Evidence-based Mental Health*. 2001;128–128.

*Reason for exclusion:* Ineligible study design

37. Luciana Paiva, Lídia Aparecida Rossi, Maria Cristina Silva Costa, Rosana Aparecida Spadoti Dantas. Life quality from the perspective of multiple trauma victims and their families. *Revista Enfermagem UERJ*. 2012;20(4):507–12.

*Reason for exclusion:* Ineligible context/HDI

38. Miller C., Jerosch-Herold C., Cross J. Patients' experience of uncertainty in diagnosis and treatment after a traumatic brachial plexus injury: Implications for rehabilitation. *Physiotherapy*. 2022;114(Supplement 1):e191–2.

*Reason for exclusion:* Ineligible study design

39. Murgatroyd D.F., Cameron I.D., Harris I.A. Understanding the effect of compensation on recovery from severe motor vehicle crash injuries: A qualitative study. *Injury Prev*. 2011;17(4):222–7.

*Reason for exclusion:* Unable to extract relevant data

40. O'Hara NN, Mugarura R, Slobogean GP, Bouchard M. The orthopaedic trauma patient experience: a qualitative case study of orthopaedic trauma patients in Uganda. *PloS one*. 2014;9(10):e110940.

*Reason for exclusion:* Ineligible context/HDI

41. Ogilvie R, Foster K, McCloughen A, Curtis K. The injury trajectory for young people 16-24 years in the six months following injury: A mixed methods study. *INJURY-INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED*. 2016;47(9):1966–74.

*Reason for exclusion:* Ineligible participant population

42. Paiva L, Rossi LA, Costa MCS, Dantas RAS. The Experiences and Consequences of a Multiple Trauma Event from the Perspective of the Patient. *Revista Latino-Americana de Enfermagem (RLAE)*. 2010;18(6):1221–8.

*Reason for exclusion:* Ineligible context/HDI

43. Paniagua AR, Mundy LR, Klassen A, Biswas S, Hollenbeck ST, Pusic AL, et al. Resilience through practicing acceptance: A qualitative study of how patients cope with the psychosocial experiences following limb-threatening lower extremity trauma. *Journal of plastic, reconstructive & aesthetic surgery : JPRAS*. 2022;75(10):3722–31.

*Reason for exclusion:* Ineligible participant population

44. Patterson MM. Adolescent experience with traumatic injury and orthopaedic external fixation: forever changed. *Orthopedic nursing*. 2010;29(3):183–92.

*Reason for exclusion:* Unclear participant population

45. Petersen C, Ullrich A, Wahls F, Glaesener J, Ueblacker P, Boettcher H, et al. Psychosocial Impairments and Resources of Multiple Injured Patients. *Physikalische Medizin Rehabilitationsmedizin Kurortmedizin*. 2008;18(6):313–7.

*Reason for exclusion:* Ineligible participant population

46. Piccolo R, Bove D. Efficacia del metodo narrativo sui processi di resilienza e di recupero dell'identità personale nell'assistenza infermieristica al paziente politraumatizzato. *SCENARIO: Official Italian Journal of ANIARTI*. 2016;33(3):34–9.

*Reason for exclusion:* Ineligible phenomena of interest

47. Rees S, Tutton E, Achten J, Bruce J, Costa ML. Patient experience of long-term recovery after open fracture of the lower limb: a qualitative study using interviews in a community setting. *BMJ open*. 2019;9(10):e031261.

*Reason for exclusion:* Ineligible participant population

48. Rich JA, Corbin TJ, Jacoby SF, Webster JL, Richmond TS. Pathways to Help-Seeking Among Black Male Trauma Survivors: A Fuzzy Set Qualitative Comparative Analysis. *Journal of Traumatic Stress*. 2020;33(4):528–40.

*Reason for exclusion:* Ineligible phenomena of interest

49. Richmond TS, Thompson HJ, Deatrck JA, Kauder DR. Journey towards recovery following physical trauma. *Journal of Advanced Nursing*. 2000;32(6):1341–7.

*Reason for exclusion:* Ineligible participant population

50. Roodbeen RTJ, Lugtenberg M, Pöstges H, Lansink KWW, Theeuwes HP, de Jongh MAC, et al. Experiences of recovery and posthospital care needs of working-age adults after physical trauma: a qualitative focus group study. *BMJ open*. 2022;12(4):e053330.

*Reason for exclusion:* Ineligible participant population

51. Rosenberg G, Zion SR, Shearer E, Bereknyci Merrell S, Abadilla N, Spain DA, et al. What constitutes a “successful” recovery? Patient perceptions of the recovery process after a traumatic injury. *Trauma surgery & acute care open*. 2020;5(1):e000427.

*Reason for exclusion:* Ineligible participant population

52. Russell AC. A dissertation submitted to Kent State University College of Nursing in partial fulfillment of the requirements For the degree of Doctor of Philosophy. :106.

*Reason for exclusion:* Ineligible participant population

53. Samoborec S., Ayton D., Ruseckaite R., Evans S.M. Biopsychosocial barriers affecting recovery after a minor transport-related injury: A qualitative study from Victoria. *Health Expect.* 2019;22(5):1003–12.

*Reason for exclusion:* Ineligible participant population

54. Sandström L, Engström Å, Nilsson C, Juuso P. Experiences of suffering multiple trauma: A qualitative study. *Intensive & critical care nursing.* 2019;54:1–6.

*Reason for exclusion:* Ineligible participant population

55. Schaffarczyk K, Nathan S, Marjadi B, Hsu J, Poulos R. Non-occupational falls from ladders in men 50 years and over: Contributing factors and impact. *Injury.* 2020;51(8):1798–804.

*Reason for exclusion:* Ineligible participant population

56. Sharp VL, Chapman JE, Gardner B, Ponsford JL, Giummarra MJ, Lannin NA, et al. Perspectives of major traumatic injury survivors on accessibility and quality of rehabilitation services in rural Australia. *Disability and rehabilitation.* 2022;1–10.

*Reason for exclusion:* Unclear participant population

57. Sleney J., Christie N., Earthy S., Lyons R.A., Kendrick D., Towner E. Improving recovery - Learning from patients' experiences after injury: A qualitative study. *Injury.* 2014;45(1):312–9.

*Reason for exclusion:* Ineligible participant population

58. Sleney J, Gosling MC, Christie DN. Exploring patient perceptions of barriers and facilitators of recovery following trauma. School of Public Health and Preventive Medicine, Monash University. Research Report # 0412-023-R1D. pp. 1-60.

*Reason for exclusion:* Ineligible participant population

59. Suresh Kumar TS, Eden T, Baron C. A new approach to assure safe and efficient major trauma care and patient experience in a London Trauma Unit. *Journal of Emergency Medicine, Trauma & Acute Care.* 2016;159–159.

*Reason for exclusion:* Ineligible study design

60. Tan K, Lim L, Chiu L. Orthopaedic patients' experience of motor vehicle accident in Singapore. *International Nursing Review.* 2008;55(1):110–6.

*Reason for exclusion:* Ineligible participant population

61. Tsai YL, Chiang HH, Chen YJ, Chiang HH, Chen YH, Liaw JJ. Meaning of critical traumatic injury for a patient's body and self. *Nursing Ethics.* 2021;28(7/8):1282–93.

*Reason for exclusion:* Ineligible context/HDI

62. Turner G., Retzer A., Slade A., McMullan C., Kyte D., Piper K., et al. Increasing capture of patient-reported outcomes in trauma research. *Injury.* 2019;50(2):224.

*Reason for exclusion:* Ineligible participant population

63. Van Horn ER. Recovery from traumatic injury: Trauma patients' perceptions of facilitators and barriers. *International Journal of Orthopaedic & Trauma Nursing*. 2013;17(4):180–9.

*Reason for exclusion:* Ineligible participant population

64. Van Horn ER, Mishel M. Loss of resources and depressive symptoms after traumatic injury. *Southern Online Journal of Nursing Research*. 2008;8(3):15p–15p.

*Reason for exclusion:* Ineligible study design

65. Wake E, Brandenburg C, Heathcote K, Dale K, Campbell D, Cardona M. Follow-up of severely injured patients can be embedded in routine hospital care: results from a feasibility study. *Hospital practice (1995)*. 2022;50(2):138–50.

*Reason for exclusion:* Ineligible participant population

66. Wang Y, Wang J, Liu X. Posttraumatic growth of injured patients after motor vehicle accidents: an interpretative phenomenological analysis. *Journal of health psychology*. 2012;17(2):297–308.

*Reason for exclusion:* Ineligible context/HDI

**APPENDIX E – Findings and Illustrations**

Findings and illustrations of included studies

<p><b>Study:</b> EKEGREN, C.L. et al., 2020. Adaptation, self-motivation and support services are key to physical activity participation three to five years after major trauma: a qualitative study. <i>Journal of Physiotherapy</i>, 66(3), pp. 188–195. (Ekegren et al. 2020)</p>	
Finding	The need to compromise on activity options and adapt to injury (U)
Illustration	"My energy levels are not as high as they used to be but I'm making sure that I get to bed at a decent hour and that I don't overstretch myself, and then I make sure I have rests when I'm working in the garden or if I'm out on the bike, that sort of stuff." Female, 60 years. Thoracic, eye and orthopaedic injuries; motor vehicle accident; 4 years after injury, #96529 (p 193)
Finding	Recognising the importance of self-motivation and self-management (U)
Illustration	"I thought when I stopped the physio at the hospital and the swimming at the rehabilitation I had to do something for myself, so I joined a gymnasium where I do swimming, exercise and physical exercise to help the arm and the rest of me. I don't think there's any more that they could really do." Female, 40 to 59 years. Upper extremity fracture; fall; 3 years after injury, #106672 (p 193)
Finding	A mismatch of desire and ability to be physically active (U)
Illustration	"It's probably my biggest issue. I almost feel sometimes that I've been penalised for being interested in the things that I was. There's almost not one thing that I was interested in before, in terms of hobbies and lifestyle, that I've been able to continue with. All my hobbies involved being physically capable. Lots of outdoor sports and cycling, different work, leisure activities, so nothing's the same anymore." Male, 18 to 39 years. Multiple fractures and other injuries; motorbike accident; 3 years after injury, #101581 (p 192)
Finding	Loss of motivation to be active due to mental health issues (U)
Illustration	"I use to like to walk, don't do that anymore. I've sort of lost interest in a lot of things, which I'm trying not to do that. I don't know whether it's because I don't have the energy or I'm depressed, I don't know which one it is. You wake up and you think I don't feel too bad today but by the time you crawl out of bed and you think I can take all these different medications but I don't want to do that because they're addictive, I don't want that. I just want to be able to go for a walk." Female, 60 years. Spinal fractures; motor vehicle accident; 4 years after injury, #97377 (p 192)
Finding	Avoiding activity due to fear of re-injury or of exacerbating symptoms (U)
Illustration	"Well I don't ride bikes anymore. I don't know that I could cope with falling off the bike, just with the nature of my injuries. It wouldn't play out for me very well. getting back on the road I just have no desire to do that now, because I have

	learnt how little control you have over the situation around you, so I don't think there is any need to put myself out there again." Female, 18 to 39 years. Multiple lower limb fractures and other injuries; cyclist hit by truck; 3 years after injury, #102276 (p 192)
Finding	Grieving the loss of important roles, relationships and enjoyment of life (U)
Illustration	"Even this morning they wanted to walk to school and I just couldn't because we walked on Monday, and I'm just too sore. That really upsets me that I can't be the kind of parent that they want, that they need." Female, 18 to 39 years. Skull fracture and other injuries; unknown cause; 3 years after injury, #102130 (p 191)
Finding	Lack of individualised transitional care from rehabilitation to community-based exercise programs (U)
Illustration	"Well, yeah, there's no services now. Ideally, there would be some ongoing availability of service. The challenge I have now is that my fitness has reached a certain point, a lot of that is my own maintenance, but it would be nice to know that I can go back to someone who understood my history if I have problems. And I know there is likely to be problems in the future." Female, 18 to 39 years. Multiple lower limb fractures and other injuries; cyclist hit by truck; 4 years after injury, #102276 (p 192)
Finding	Support from other people and services (U)
Illustration	"... what [the TAC] have done for me with helping me to purchase this bike, or purchasing this bike for me, it's at least made cycling a possibility again, and I've been able to get out and do some small rides and at least get the legs turning again." Male, 18 to 39 years. Multiple fractures and other injuries; motorbike accident; 3 years after injury, #101581 (p 193)
Finding	Concerns about their long-term health decline as a result of physical inactivity (U)
Illustration	"I drive a lot more now, just because the added walking from the tram to work, it just all adds up to make it harder and harder. And that's not going to be good for my health in the future, all that time sitting in a car." Female, 18 to 39 years. Multiple lower limb fractures, thoracic and other injuries; pedestrian hit by truck; 4 years after injury, #97426 (p 191)
<b>Study:</b> BRAAF, S. et al., 2020. Traumatic injury survivors' perceptions of their future: a longitudinal qualitative study. <i>Disability and Rehabilitation</i> , 42(19), pp. 2707–2717. (Braaf et al. 2020)	
Finding	An uncertain future (U)
Illustration	"When you get out of bed in the morning ... and you can't even move, and you're lying in bed and all you want to do is get up to go to the toilet, and even that's too hard . ... if I'm like this now what am I going to be like in five years' time, 10 years' time?" Male_16-29yrs _Multiple severe fractures and other injuries_yr3_#581* (p 2710)

Finding	Living in the present (U)
Illustration	"[My future physical state is] probably about what it is now. It only limits you if you let it, and I ain't letting it ... If you've got a good set in your mind, that it [the injuries] aren't going to stop you, that you can do anything, you will do it." Male_50-59yrs_lower extremity fractures_yr3_#553* (p 2712)
Finding	Impact of ageing (U)
Illustration	"My back is getting worse. There are some days I don't think my hips can carry me ... . ' I'm frightened I'm going to end up in a wheelchair." Female 50-59yrs _ Spine and thoracic fractures and other injuries_yr4_#377* (p 2711)
Finding	Future viewpoint over time (U)
Illustration	1) The future just scares the shit out of me. I don't know how I'm going to cope, I don't know where I'm going to end up because I'm on my own so I've just got no idea what's going to happen. Female_50-59yrs _Multiple severe fractures and other injuries_yr3_#427; 2) I'm so terrified of the future and all the rest of it. Yr4_#427: 3) I fear for that [the future]. I hope like hell the doctors are all wrong and I don't get severe arthritis ... and the fact that if it does happen it would limit my mobility even further and that's a real worry. Yr5_#427 (p 2711)
Finding	Seeking information (C)
Illustration	Participants wanted to know how long insurers would provide financial support, how to prevent the development of secondary conditions and further injury, and continue their rehabilitation without professional support (p 2713)
Finding	Persistent pain and mental health issues (C)
Illustration	"So I try not to think about it often, but I see a pretty sort of uncomfortable life ahead as I get older." Female_30-39yrs_Thoracic and lower limb injuries_yr3_#642* (p 2711)
Finding	Preventive action (U)
Illustration	"[The future] will depend on how hard you push it and how well you exercise and how well you keep it moving, don't put on excessive weight, and all that sort of stuff for the rest of your life ... . you're only going to get out of it what you put into it." Male_40-49yrs_Thoracic, abdominal and orthopaedic injuries_yr3_#394* (p 2712)
Finding	Feeling powerless to change of plan the future (U)
Illustration	"I worry about what's going to happen in my future because my cardiovascular fitness is nowhere near what it was. And it's very difficult to change that because I get tired and my joints get stiff, and my feet swell... But this is nothing I can do anything about, and it's certainly not for lack of trying." Female_30-



	39yrs_Multiple lower limb fractures, thoracic and other injuries_yr4_#426 (p 2711)
Finding	Hopeful (C)
Illustration	Some participants were hopeful that there would be no impacts from their injury in the future. People who expected no impacts generally reported a full recovery and a return to their usual activities at the 3-year post-injury interview. However, cautious language was used such as “shouldn’t,” “wouldn’t think so,” “hope,” and “don’t anticipate,” indicating a lack of confidence in their predictions (p 2711)
Finding	Future losses and opportunities (U)
Illustration	"I can't do what I wanted to do. And the fact is that I had to ditch my dream [career] goal, as I can't really do it. Something I've wanted to do for most of my life." Male_16-29yrs_Throacic and abdominal injuries and knee fractures_yr4_#664* (p 2712)
Finding	Redefining normal and the future (U)
Illustration	"I think there is a new normal, because my old normal can't be anymore ... probably about a year, year-and-a-half, when I sort of felt this is it, day in, day out ... I think it sort of took me until then to realise that life wasn't going to be normal anymore ... [you] need to make new goals because the ones that you had are not attainable any more." Female_50-59yrs_Multiple fractures and abdominal injuries_yr3_#724* (p 2713)
<b>Study:</b> REEDER, S. et al., 2021. Long-term health and mobility of older adults following traumatic injury: a qualitative longitudinal study. <i>Disability and Rehabilitation</i> , pp. 1–11. (Reeder et al. 2021)	
Finding	Expectations of recovery as an older adult (U)
Illustration	I also had a problem, and this is probably age, I didn't have the lift in the muscles of my legs. I hate the fact that I'm getting older and that perhaps I need to work harder to keep the muscles strong. (Female_MT2_non-compensable_year_3) (p 5)
Finding	Access to services (U)
Illustration	"About 18 months all of a sudden [the injury insurer] stopped it [physiotherapy]. They said if I want to go and get other private attention I could, but I have trouble with transport... [and] I'm not in private health insurance. I'm only on the pension... so, I couldn't afford that." (MT6_Year 4) (p 6)
Finding	Dealing with concurrent health conditions and conditions secondary to injury (C)
Illustration	Many participants described having concurrent health conditions such as hypertension, diabetes, and high cholesterol levels. Some health conditions were recognised post-injury and some were present pre-injury and required ongoing medical attention as the person aged. (p 6)

Finding	Concerns about falls (U)
Illustration	"Because my ankle has been fused ... if I'm walking on uneven ground, I've got to be very careful where I put my foot and put my weight." (Male_MT5_compensable_year 3) (p 7)
Finding	The perceived combination of injury and ageing (U)
Illustration	"[The injury] did [impact] for 18 months or two years. I suppose it's affecting me a bit now because not so much the accident but age is catching up with me, too." (Male_MT1_non-compensable_year_3) (p 5)
Finding	Health and support service use (C)
Illustration	Most reported contact with a GP, and some with specialist services, such as psychologists or surgeons. For older adults with MT, irrespective of their compensable status, by three years post-injury none engaged with allied health services such as physiotherapy and occupational therapy. (p 6-7)
Finding	Self-management and adaptation (U)
Illustration	"Let's face it, we're all getting older; I'm [exact age] ... . I don't let myself get tired out. I don't go too much on one thing. I don't sit down for too long. I might sit down for an hour or something but I get up and walk around and I go outside, I might water the garden. I take my walker out there so that I'm safe. " Female_MT7_compensable_year 4) (p 7)
Finding	Trying to remain physically active (C)
Illustration	A change from being an "active" older adult to "slowed down" by the injury was highlighted. Over the 3-year study period, limited range of motion, limited strength, pain, and unsteady gait (e.g., limping) all contributed to a reduction in activity and mobility. (p 5)
<b>Study:</b> BRAAF, S. et al., 2018. Patient-identified information and communication needs in the context of major trauma. <i>BMC Health Services Research</i> , 18, pp. 1–13. (Braaf et al. 2018)	
Finding	Access to information (U)
Illustration	"Because once you get your discharge it's like you're on your own. You got to do it yourself... you feel sort of alienated..." Male_30–39yrs_road traffic injury_multiple injuries_community care_#688 (p 7)
Finding	Clarity of information (C)
Illustration	Information delivered by health professionals using inaccessible language left many patients confused and dissatisfied. (p 6)
Finding	Single point of communication for patients and health professionals involved in their care (U)

Illustration	“A case manager... someone that has a good look at everything and make sure that all the information is passed on to the patient, as well as anyone dealing with them: patient and family. It all seems to be like a big sort of a lot of people fixing different parts of you and no-one thinking to put all the information together and let you know, or anyone.” Male_40–49yrs_road traffic injury_multiple injuries_community care_#773 (p 8)
Finding	Consistency of information (U)
Illustration	“The discharge summaries, the one I got from (name of rehabilitation) and one I got from (name of hospital), are completely different in explaining what happened and what I can do now.” Male_17–29yrs_road traffic injury_multiple injuries_community care_#860 (p 7)
Finding	Community care (C)
Illustration	Patients consistently reported wanting GPs to provide information on managing, treating and reducing persistent physical and psychological disability and chronic pain, as well as return to work. Information on improving strength, fitness, range of motion in damaged joints, and increasing mobility was also desired from physiotherapists. (p 6)
Finding	Unfavourable communication attributes: dismissal of patient concerns (U)
Illustration	"My GP, I'm not happy at all... all he does is write out narcotics (prescriptions). It's more than one at a time. They are different ones, and to take together. I was asleep nearly all day and night. I can't do that... He doesn't even examine me... I feel as though I go in there and he just wants to get me out." Female_60–69yrs_non-transport injury_multiple injuries_community care_#980 (p 9)
Finding	Provision of written information (U)
Illustration	“For me it would have been no good telling me anything at (hospital name). Perhaps if (hospital name) issued you ... a (written) summary of what your injuries were when you were brought in, what you were diagnosed with and resulting treatments that they performed.” Male_1729yrs_road traffic injury_multiple injuries_rehabilitation care_#581 (p 8)
Finding	Unfavourable communication attributes: a lack of patient engagement (U)
Illustration	“I just think they (surgeons) could have asked me was there any issues, because I did have issues. I had a neck issue, and I still have a neck issue....” Male_60–69yrs_road traffic injury_multiple injuries_community care_#381 (p 8)
Finding	Favourable communication attributes (C)
Illustration	Patients also valued frequent contact, a sensitive and attentive manner, personalising information, good listening skills, not rushing communication, and being responsive to their needs and questions. (p 8)

Finding	Concern about the organisation of their information between hospital and primary care providers (U)
Illustration	“I was told I was supposed to go back in a month’s time ... and have a follow up x-ray. When I rang to get that organised no-one knew about it (or) me and they had no idea what I was talking about... I didn’t have any more X-rays... but I still had broken ribs... So my right lung wasn’t working properly, and that’s why I got pneumonia.” Male_40–49yrs_non-transport injury_multiple injuries_community care_#533 (p 8)
Finding	Fragmented information about their injuries and the care delivered (U)
Illustration	“I didn’t have one particular person giving you all the information. It was just the medical staff as they came through. It was only at the end that I recall, that I got the information all put together.” Female_60–69yrs_road traffic injury_multiple injuries_hospital & rehabilitation care_#415 (p 7)
<b>Study:</b> BAKER, E. et al., 2021. Challenges associated with recovery from blunt thoracic injuries from hospital admission to six-months after discharge: A qualitative interview study. <i>International Emergency Nursing</i> , 57, p. 1-9. (Baker et al. 2021)	
Finding	Impact of injuries on mental wellbeing (U)
Illustration	[Cilla 70] ‘I got very low at the beginning of February I think for about three weeks. It was possibly pain related, but it was more just frustration and irritation in a way and anger that it had happened at all because I had actually just come through a number of very difficult years.’ (p 6)
Finding	Pain and analgesics at home (U)
Illustration	[Cilla 70] ‘But after about three weeks, I must have been feeling that I could manage without it and I tried to cut the Tramadol by half but that didn’t work, so I went back on to the full dose again. But then I was beginning to get incredibly nauseous. I couldn’t eat ... And finally, I thought no I’ve just got to get off the opioids regardless of the pain. So, I just gritted my teeth and came off them completely for a week. It was a pretty miserable week.’ (p 5)
Finding	The Hidden Injury (U)
Illustration	[Bill 60] ‘I was able to start doing a bit more exercise in the gym and I found I was having problems with breathing...I said to the [orthopaedic] consultant, since I was discharged from trauma, I’ve got no real followup on my ribs and I do feel like my breathing is problematic... So, he referred me to the chest clinic... they had a look at the x-rays and my diaphragm was sitting quite high on my left side. That had been noticed at the time of the accident on the scans but when they had a look again it was slightly even higher. I did some [lung] function tests where my breathing was impaired and got poor results. So, then I had a dynamic test for the diaphragm with an ultrasound, which showed that it wasn’t really moving.’ (p 6)

<b>Study:</b> BAKER, E. et al., 2022. The processes of hospital discharge and recovery after blunt thoracic injuries: The patient’s perspective. <i>Nursing Open</i> , 9(3), pp. 1832–1843. (Baker et al. 2022)	
Finding	Optimizing recovery (C)
Illustration	Participants identified the challenge of self-managing their recovery and their reliance on others to help them with daily life. For many participants, previously “simple tasks” became almost impossible due to their impeded movement, reduced weightlifting tolerance and restricted mobility. (p 1838)
Finding	Living with symptoms after discharge (U)
Illustration	"I was in really acute pain and occasionally as I laid in bed it went off but as soon as I tried to move or tried to get up the pain returned and it took some time to get rid of it again like, two or three hours." [Reg 77] (p 1838)
Finding	Medication safety (U)
Illustration	"...If they did, I didn't hear it because possibly they may have but there was very little written, there was no written guidance about medication, how to slow down and how to wean... When I came off [the] drugs I was cold turkey and very confused and very fragile and lots of bad dreams..." [Lydia 48] (p 1839)
<b>Study:</b> BEATTIE, J. et al., 2018. What Happens to the Farm? Australian Farmers’ Experiences after a Serious Farm Injury. <i>Journal of Agromedicine</i> , 23(2), pp. 134–143. (Beattie et al. 2018)	
Finding	Effect on farm work (U)
Illustration	“There was six months’ work on the farm I could have done that didn’t get done. It set the farm back one year in terms of repairs and maintenance and small improvements that I otherwise would have done.” (Male, fall from truck tray, fractured vertebrae) (p 137)
Finding	Farming future (U)
Illustration	“Whether I’ll get some sort of arthritis earlier, either in my spine or my wrist, who knows, 10 or 20 years’ time, I have no idea. I’ll just have to take it as it comes. I hope I’ll be okay but I guess there’s potential for it to give me an earlier retirement than I otherwise might have had.” (Male, fall from truck tray, fractured vertebrae) (p 138)
Finding	Changes in farming practices due to injury (U)
Illustration	"We redid our yards anyway, which we had planned to do before then. We’ve just made them even more secure where at no time you have to be in with the cows, you’re always behind a gate, and you’d be pushing them into another area, so there is a lot more safety focus." (Female, injured by cattle, broken vertebrae) (p 139)
Finding	Financial Impact (U)

Illustration	"It had a financial impact, yes. There was no income for virtually 12 months." (Male, fall from farming structure, multiple fractures) (p 140)
<b>Study:</b> BRAAF, S. et al., 2019. A Qualitative Exploration of Return to Work in the First 3-Years After Serious Injury. <i>Journal of Occupational &amp; Environmental Medicine</i> , 61(12), pp. e461–e467. (Braaf et al. 2019)	
Finding	Drive for Occupational Engagement (U)
Illustration	"It was very hard to go back to work...I knew I had to. I think having that in the back of your mind, because you work for yourself, you got to look forward and so there is a light at the end of the tunnel... But I honestly say if I don't get an income... I won't survive." Male_40–59yrs_compensable (p e465)
Finding	Making Considered Decisions (U)
Illustration	"You sort of don't want to drive buses...as an attitude you're not really happy with [that] because you've spent 20 years being the person, or doing the job you do, so you've got quite high up in your trade.... finding something that I could do and still have some sort of input was brilliant for me [teaching apprentices]...use some of the knowledge I had in another way." Male_40 – 59yrs_compensable (p e465)
Finding	Social Support and Connections (C)
Illustration	Coworkers and managers provided practical and moral support related to undertaking the job role. This included modifying job roles, offers to assist with work, lifting heavy items, or placing them in a way that prevented bending, or by respecting needs such as time to stretch, or for no interruptions when concentrating[.] (p e464)
Finding	Adjusting to Work Post-Injury (C)
Illustration	Many people with injuries described resilient attitudes and adapting to their post-injury work circumstances. (p e465)
Finding	Changing Jobs to Find Meaningful and Appropriate Work (C)
Illustration	The decision to leave a workplace predominantly related to employers failing to deliver promises or respond to needs... unsatisfying work, or the work being too physically or mentally demanding... (p e465)
Finding	Specialized Supports (C)
Illustration	Health professionals such as general practitioners (GPs), rehabilitation specialists and occupational therapists (OTs), enabled and supported RTW for workers with injuries by providing advice and advocacy, and by dealing directly with employers... (p e464)
Finding	Finding Balance (U)

Illustration	"I was working pretty massive hours and I was on reduced capacity. So I was causing all sorts of damage, both to family and my own mental health.... My work has been decreased over the last 12 months. So I've gone effectively to four days a week, so I can manage my workload a bit better... Everything is going pretty well on the current arrangements." Male_40–59yrs_compensable (p e465)
Finding	Supportive Workplace (U)
Illustration	"So the workplace advocated very strongly for my rights to compensation, argued with the insurers and advocated with them... My employers have been fantastic, and made every provision they could for me to get back to work as soon as I was ready." Female_40–59yrs_compensable (p e464)
<b>Study:</b> CHRISTIE, N. et al., 2017. The role of social networks in supporting the travel needs of people after serious traumatic injury: A nested qualitative study. <i>Journal of Transport &amp; Health</i> , 6, pp. 84–92. (Christie et al. 2017)	
Finding	The role of taxis (U)
Illustration	"... the taxis didn't always turn up. And a couple of times they didn't turn up and I had appointments. It wasn't as if I'd booked it half-an hour before, it was booked hours before. And they're just scary ... to drive in a car with a taxi driver straight after an accident, that's just beyond scary." (Female, Metro, Patient, Major, Transport related, 46, Thoracic and orthopaedic injuries) (p 89)
Finding	Emotional burden (U)
Illustration	"I wasn't able to drive. And even now, driving from (name of suburbs) to visit my mum, who obviously doesn't drive anymore, is a hassle, which is another burden I put on my husband. On his day off, "Can you drive me over to see my mum?"" (Female, Metro, Patient, Major, Transport related, 46, Head, thoracic and dental injuries, spinal fractures). (p 88)
Finding	Environmental barriers (C)
Illustration	For many wheelchair users their ability to engage with their social network became difficult because they found the environment inaccessible[.] (p 88)
Finding	Dependence on others for transport (U)
Illustration	". my husband took me at first because there was no way I would have been able to manage getting out the door and getting along the drive and getting into the physiotherapist's without some help, because my injuries really were quite painful and I wasn't very manoeuvrable and didn't have a lot of stamina." (Female, Regional, Patient, Major, Transport related, 63, Head injury, spinal, pelvic and lower limb fractures). (p 86)
Finding	Engaging with social activities (U)
Illustration	"All my hobbies involved being physically capable. I really enjoyed working on and racing and fixing, anything to do with cars, but I find it very, very difficult to

	do any of that now, if at all. Lots of outdoor sports and cycling, different work, leisure activities, so nothing's the same anymore. It's even hard for me to drive around and visit people. You spend so much time on your own, you don't know what to do any more socially." (Male, Metro, Patient, Major, Transport related, 28, Multiple fractures and other injuries) (p 88)
<b>Study:</b> CLAYDON, J.H., ROBINSON, L. and ALDRIDGE, S.E., 2017. Patients' perceptions of repair, rehabilitation and recovery after major orthopaedic trauma: a qualitative study. <i>Physiotherapy</i> , 103(3), pp. 322–329. (Claydon, Robinson and Aldridge 2017)	
Finding	Doing the right thing (U)
Illustration	"I take notice of everything they say. I like to, I just want to get better, that's me main aim to get better . . . Well I, just do things what they say" Neil (p 325)
Finding	Dealing with uncertainty (U)
Illustration	"I didn't feel as though it was . . . healing correctly and I, it, it still feels in exactly the same as it did when I did it" Chris (p 325)
Finding	Measuring progress (C)
Illustration	Participants evaluated their progress using a range of parameters, including physiological (fracture healing), physical (range of movement, starting to weight bear), functional (return to work or usual activities) and emotional (confidence, enjoyment). (p 326)
Finding	Restoring independence (U)
Illustration	"I started to feel better towards the end of my time off; I did actually start to enjoy my time off. You know I could actually start going out and doing things when I physically and emotionally felt a bit better" Ewan (p 325)
Finding	Being a burden on others (U)
Illustration	"So I'm happy to admit that I've been emotional but I certainly don't, didn't want to burden other people with my crap, you know" Alice (p 325)
Finding	Control my frustration (U)
Illustration	"Couldn't quite do it yet. Yeah, it was more of the, the frustration than anything. Like I say, it's, that's, I think it's the brain that makes the body get better. It's got to be because, keeping focused and having that goal" Michael (p 325)
Finding	Getting on with it (U)
Illustration	"Well, I guess I've just got on with it really . . . I feel very, you know, accepting of what's happened and just got to get on with it really" Beth (p 325)
Finding	It's up to me (U)
Illustration	"Basically at the end of the day, it's up to me I think. Whether I, I mean obviously the operations and things weren't up to me, but I feel the physio, it, it's you can



	get the best advice, but unless you take it and get on with it you may not get the best result" Beth (p 325)
Finding	Redefining me (U)
Illustration	"I kind of think it's made us stronger. I know more, I was determined and had stamina before and I think I've got even more than I had then" Michael (p 325)
<b>Study:</b> CONN, L.G. et al., 2023. A qualitative study of older adult trauma survivors' experiences in acute care and early recovery. <i>CMAJ Open</i> , 11(2), pp. E323–E328. (Conn et al. 2023)	
Finding	Getting back to normal (C)
Illustration	Participants emphasized their active lifestyles and functional recovery as goals of care. When describing their goals of care, getting back to normal was the prevailing expression. Many participants emphasized returning to their active independent lifestyles. (p E326)
Finding	"I have lost control of my life" (C)
Illustration	Many participants described loss of independence, which manifested as total life disruption, and expressed unhappiness about new permanent living or working arrangements, such as work retirement, driving retirement or need for assisted living. (p E326)
<b>Study:</b> MURRAY, M. et al., 2019. 'It could have been a lot worse': the psychological effects of farm-related serious injury in Victoria. <i>Rural and Remote Health</i> . [online]. Available from: <a href="https://www.rrh.org.au/journal/article/5323">https://www.rrh.org.au/journal/article/5323</a> [Accessed 9 Sep 2022]. (Murray et al. 2019)	
Finding	Traumatic thoughts post-injury (U)
Illustration	"I had a mental replay of the whole incident, which went round my mind endlessly, every waking hour. And then that slowly became less, to where it would just become a snippet." (Male, fall from a horse, multiple fractures) (p 4)
Finding	The importance of the support network and community (U)
Illustration	"If I didn't have family it may have been a different ballgame. It's hard to say, isn't it? But I know they did a lot ... I don't know how people survive without it really, without a friend or a family member." (Female, fall, multiple fractures) (p 4)
Finding	The importance of a pragmatic outlook (U)
Illustration	"I've got a good outlook. Don't whine about anything, just look forward and get on with it. If it hurts, it doesn't matter, just do it." (Male, firearm incident, chest and abdominal injuries) (p 4)
Finding	Grief, helplessness and loss of independence (U)
Illustration	"Grieving the loss of your life you used to have. Even now, I don't go outside much because I don't like seeing people from the old life, people you used to know. I feel embarrassed." (Female, fall from a horse, fractured vertebrae) (p 4)

<b>Study:</b> OGILVIE, R. et al., 2015. Young peoples' experience and self-management in the six months following major injury: A qualitative study. <i>Injury</i> , 46(9), pp. 1841–1847. (Ogilvie et al. 2015)	
Finding	'I think I've definitely, grown from this experience' (U)
Illustration	"I think I've definitely like, grown from this experience. . . it's like I've been moulded differently but I'm still the same piece of clay, or like, I'm a garden that has a whole extra bed of flowers now; I'm the same garden, but it's different" (Emma, 19) (p 1845)
Finding	'They don't really understand at all' (U)
Illustration	"I know that if I don't get the results they want, they're not going to let me do this and that" (Belinda, 19) (p 1845)
Finding	'If I'm not distracted, I feel pain, I feel emotion' (U)
Illustration	"There's massive turmoil that goes on inside, where you're new physically and new mentally and there's a lot of guilt and self pressure and confusion about what others expect of you. I don't know when I should be pushing myself, when I should be holding back more, like I don't know if I'm being lazy or wise, I don't know if I'm being crazy or if I'm just trying to push myself to get better. . . you've never been through this before so you don't know how strong you are. All you have is your mind and your mind plays tricks and so you just never know what you're meant to be doing" (Emma, 19) (p 1844)
Finding	'I was ok, and then it hit me!' (U)
Illustration	"I worry that I make my family worry, and I kind of blame myself. I know it's not very rational but (crying) what I put my family through, I really worry about that and mum worries that I don't really think about the accident a lot but I think about it every day in everything I do" (Melanie, 18) (p 1844)

APPENDIX F – EQ-5D Outcome Measure



## Health Questionnaire

### English version for the UK

#### VERSION FOR INTERVIEWER ADMINISTRATION

---

*Note to interviewer: although allowance should be made for the interviewer's particular style of speaking, the wording of the questionnaire instructions should be followed as closely as possible. In the case of the EQ-5D-5L descriptive system on page 2 of the questionnaire, the precise wording must be followed.*

*If the respondent has difficulty choosing a response, or asks for clarification, the interviewer should repeat the question word for word and ask the respondent to answer in a way that most closely resembles his or her thoughts about his or her health today.*

---

#### INTRODUCTION

*(Note to interviewer: please read the following to the respondent.)*

**We are trying to find out what you think about your health. I will explain what to do as I go along, but please interrupt me if you do not understand something or if things are not clear to you. There are no right or wrong answers. We are interested only in your personal view.**

**First, I am going to read out some questions. Each question has a choice of five answers. Please tell me which answer best describes your health TODAY.**

**Do not choose more than one answer in each group of questions.**

*(Note to interviewer: first read all five options for each question. Then ask the respondent to choose which one applies to him/herself. Repeat the question and options if necessary. Mark the appropriate box under each heading. You may need to remind the respondent regularly that the timeframe is TODAY.)*

### EQ-5D DESCRIPTIVE SYSTEM

**First, I would like to ask you about MOBILITY. Would you say that:**

- You have no problems in walking about?
  - You have slight problems in walking about?
  - You have moderate problems in walking about?
  - You have severe problems in walking about?
  - You are unable to walk about?
- 

**Next, I would like to ask you about SELF-CARE. Would you say that:**

1. You have no problems washing or dressing yourself?
  - You have slight problems washing or dressing yourself?
  - You have moderate problems washing or dressing yourself?
  - You have severe problems washing or dressing yourself?
  - You are unable to wash or dress yourself?
- 

**Next, I would like to ask you about USUAL ACTIVITIES, for example work, study, housework, family or leisure activities. Would you say that:**

- You have no problems doing your usual activities?
  - You have slight problems doing your usual activities?
  - You have moderate problems doing your usual activities?
  - You have severe problems doing your usual activities?
  - You are unable to do your usual activities?
- 

**Next, I would like to ask you about PAIN OR DISCOMFORT. Would you say that:**

- You have no pain or discomfort?
  - You have slight pain or discomfort?
  - You have moderate pain or discomfort?
  - You have severe pain or discomfort?
  - You have extreme pain or discomfort?
- 

**Finally, I would like to ask you about ANXIETY OR DEPRESSION. Would you say that:**

- You are not anxious or depressed?
  - You are slightly anxious or depressed?
  - You are moderately anxious or depressed?
  - You are severely anxious or depressed?
  - You are extremely anxious or depressed?
-

EQ-5D VAS

1. Now, I would like to ask you to say how good or bad your health is TODAY.

2. I would like you to picture in your mind a vertical line that is numbered from 0 to 100.

*(Note to interviewer: if interviewing face-to-face, please show the respondent the VAS line.)*

3. 100 at the top of the line means the best health you can imagine.

0 at the bottom of the line means the worst health you can imagine.

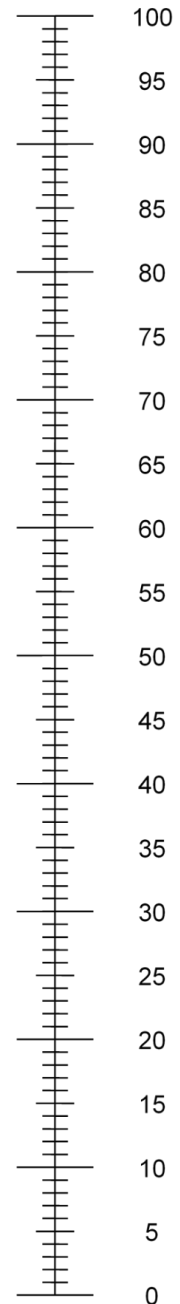
1. I would now like you to tell me the point on this line where you would put your health TODAY.

*(Note to interviewer: mark the line at the point indicating the respondent's health today. Now, please write the number you marked on the line in the box below.)*

THE RESPONDENT'S HEALTH TODAY =

**Thank you for taking the time to answer these questions.**

The best health  
you can imagine



The worst health  
you can imagine

APPENDIX G – EQ-5D Approval



EuroQol Research Foundation  
Marten Meesweg 107  
3068 AV Rotterdam  
The Netherlands

T +31 88 2026890  
E [userinformationservice@euroqol.org](mailto:userinformationservice@euroqol.org)  
[www.euroqol.org](http://www.euroqol.org)

**Subject: Non-commercial use of EQ-5D**

Dear Sir/Madame,

Thank you for your request to use the EQ-5D.

To use the EQ-5D Digital on an unsupported digital platform, for which EuroQol does not have EQ-5D modules available, you will have to implement the EQ-5D Digital yourself on the digital platform of your choice. EuroQol will provide documentation to assist you with the correct digital implementation. Via the online Customer Portal you will be supplied with the following:

- **Excel file(s) with the EQ-5D labels**
- **Digital Representation Design Guidelines** – with detailed instructions on how to implement the EQ-5D on a digital platform.
- **EuroQol Office Representations** – example screenshots of digital EQ-5D reproductions for every requested language, which comply with the Digital Representation Design Guidelines. These Representations will enable you to check if you have placed all EQ-5D labels correctly in your digital EQ-5D implementation. The Representations also allows you to check if your reproduction meets EuroQol's standards

Here are the most important guidelines:

- The digital reproduction of EQ-5D Digital should be **responsive** and **should not require scrolling** at any point during the completion of the EQ-5D;
- Every dimension of the EQ-5D should be displayed on a separate screen with the instruction above the dimension and the levels listed below each other;
- The copyright line should be displayed on every screen;
- The VAS should be vertical with the VAS instructions next to the scale.

Please see the Representation Design Guidelines and the Representation for more detailed instructions. Compliance with the Representations is important to ensure that you collect unbiased data.

Any deviation from the Representations might affect the quality of the data. Consequently, any deviation from the provided Representation(s) will be at your own risk. EuroQol's total liability relating to the provided documents shall be limited to compensation of direct loss that is attributable to EuroQol. In no event shall EuroQol's total liability be more than 1000 Euros, except in case of

EQ-5D, HELPING THE WORLD MAKE BETTER HEALTH DECISIONS™

gross negligence or willful misconduct by EuroQol.

Please sign this letter digitally or by printing and signing with a pen. You are then kindly requested to upload the signed letter via the online Customer Portal. After receipt of the signed letter, the documents will be made available in the online Customer Portal, and you are allowed to use the EQ-5D Digital for the duration of the registered Study or ROM/PROMs Project.

Please be advised that separate permission is required if:

- the Study or ROM/PROMs Project is funded by a pharmaceutical company, medical device manufacturer or for profit stakeholder;
- the intention is to charge a fee for third party access to the collected EQ-5D data in the Study or ROM/PROMs Project.

Further, please note that the following is **not allowed**:

- Making the EQ-5D Digital available on paper.
- Using the EQ-5D Digital in a new study/project without a new registration.
- Distributing the EQ-5D Digital to third parties (other than clinical sites, regulatory commissions, respondents, involved digital vendors) without prior approval of EuroQol.
- Modifying, altering, or amending the provided EQ-5D Digital.
- Developing any new language of the provided versions without permission of EuroQol.
- Reproducing the EQ-5D Digital in a publication or on the internet without permission.

If you have also requested the EQ-5D Paper or EQ-5D Modules, please be advised that the Terms of Use Non-Commercial attached in the Appendix are applicable to the use of the EQ-5D Paper.

If any dispute arises out of or in connection to this Letter, parties shall strive to amicably settle the dispute.

If you have any questions related to this Letter, please reach out to [userinformationservice@euroqol.org](mailto:userinformationservice@euroqol.org). Please refer to the registration ID number and Study or ROM/PROMs Project title (both can be found on the Registration Confirmation email you received from EuroQol).

<b>As agreed for Registration ID:</b>	50917
<b>Your name:</b>	Laura Kromrey
<b>Your position:</b>	Doctoral Research Student
<b>Signature:</b>	<i>Laura Kromrey</i>
<b>Date:</b>	27 July 2022

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APPENDIX H – SREC Ethical Approval

APPENDIX I – SREC Ethics Amendment



**SCHOOL OF HEALTH SCIENCES**

The Robert Gordon Building  
Robert Gordon University  
Garthdee Road  
Aberdeen  
AB10 7QG  
United Kingdom  
Tel: 01224 263250  
www.rgu.ac.uk

Date: 12/12/2022

Dear Laura,

Re: School of Health Sciences Research Ethics Committee Application

**Study Title:** Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of [Scotland](#)

**Reference Number:** SHS/22/02

Thank you for your submission and for addressing any outstanding points raised in the review process. I can now confirm that you have approval to commence your study as described in the submitted proposal and supporting documentation. Should you wish to amend the study in any way please seek approval to do so by submitting an Amendment form.

I wish you every success with [the study](#).

Yours sincerely: Anastasia Pavlova

A handwritten signature in black ink that reads 'Anastasia Pavlova'.

School Research Ethics Committee Convenor



Robert Gordon University, a Scottish charity registered under charity number SC013781

Dean, School of Health Sciences  
Laura Binnie  
MSc BSc FHEA





**SCHOOL OF HEALTH SCIENCES**

The Ishbel Gordon Building  
Robert Gordon University  
Garthdee Road  
Aberdeen  
AB10 7QG  
United Kingdom  
Tel: 01224 263250  
www.rgu.ac.uk

Date: 01/02/2023

Dear Laura

**Re:** School of Health Sciences Research Ethics Committee Amendment Application

**Study Title:** Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland

**Reference Number:** SHS/22/02

Thank you for your recent amendment submission. This has undergone consideration and I am happy to now confirm that you have approval to commence your study as described in the submitted amendment. Should you wish to amend the study further in any way please seek approval to do so by submitting an additional Amendment form.

I wish you every success with this study.

Yours sincerely: Anastasia Pavlova

A handwritten signature in black ink that reads 'Anastasia Pavlova'.

School Research Ethics Committee Co-Convenor



Robert Gordon University, a Scottish charity registered under charity number SC013781

Dean, School of Health Sciences  
Laura Binnie  
MSc BSc FHEA

APPENDIX J – SREC Ethics amendment



**SCHOOL OF HEALTH SCIENCES**

The Ishbel Gordon Building  
Robert Gordon University  
Garthdee Road  
Aberdeen  
AB10 7QG  
United Kingdom  
Tel: 01224 263250  
www.rgu.ac.uk

Date: 31/03/2022

Dear Laura Kromrey,

Re: School of Health Sciences Research Ethics Committee Amendment Application

**Study Title:** Recovery Experiences After Traumatic Injury

**Reference Number:** SHS/22/02

Thank you for your amendment submission and I can confirm you now have ethical approval.

I wish you every success with this study.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Joanna Shim'.

Joanna Shim

School Research Ethics Committee Co-Convenor



Robert Gordon University, a Scottish charity registered under charity number SC013781

Dean, School of Health Sciences  
Laura Binnie  
MSc BSc FHEA

**APPENDIX K – Confirmation of not requiring R&D Permission****LAURA KROMREY (1815097)**

**From:** GRAM Randdpermissions <gram.randdpermissions@nhs.scot>  
**Sent:** 08 December 2022 09:15  
**To:** LAURA KROMREY (1815097)  
**Cc:** Lyndsay Alexander (shs); Kay Cooper (shs); Angela Gall (NHS Grampian); GRAM Randd  
**Subject:** Permission Query

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

You don't often get email from gram.randdpermissions@nhs.scot. [Learn why this is important](#)

Morning Laura

If the Quality Improvement and Assurance Team have registered it, we are happy they have classed it as Service Evaluation and R&D Permission is not required.

Looks like you are doing all the right things regarding Caldicott and School Ethics so we do not need anything further from you.

Thank you for checking as it can be a minefield! Hope your project goes well

Kind regards

Louise

Non-Commercial Team  
Research & Development  
Foresterhill House Annexe  
ABERDEEN AB25 2ZB

E-MAIL - gram.randdpermissions@nhs.scot

Direct Line - Louise/Linda 01224 553846

Rituka 01224 559452

Please note staff are currently working remotely with intermittent access to office phone lines

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This email is intended for the named recipient only. If you have received it by mistake, please (i) contact the sender by email reply; (ii) delete the email from your system; . and (iii) do not copy the email or disclose its contents to anyone.

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## APPENDIX L – Quality Improvement & Assurance Team (QIAT) Registration

### LAURA KROMREY (1815097)

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**From:** Angela Gall (NHS Grampian) <angela.gall@nhs.scot>  
**Sent:** 21 September 2022 11:22  
**To:** LAURA KROMREY (1815097)  
**Subject:** Fw: Register Audit with QIAT

see below

A

---

**From:** GRAM Qiat <gram.qiat@nhs.scot>  
**Sent:** 21 September 2022 09:36  
**To:** Lyndsay Alexander (shs) <l.a.alexander@rgu.ac.uk>; Angela Gall (NHS Grampian) <angela.gall@nhs.scot>  
**Subject:** Re: Register Audit with QIAT

I can confirm receipt of your registration form and have registered your audit on our database (Project ID 5791). Thank you.  
(Copy of submission below)

If a report gets written for this work please send us a copy.

Regards,

**Quality Improvement & Assurance Team**  
 Summerfield House, 2 Eday Road, Aberdeen, AB15 6RE

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**From:** noreply@online1.snapsurveys.com <noreply@online1.snapsurveys.com>  
**Sent:** 15 September 2022 17:39  
**To:** GRAM Qiat <gram.qiat@nhs.scot>  
**Subject:** Register Audit with QIAT

### **Audit/Service Evaluation Registration**

#### **Audit Name**

exploring recovery experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland: An exploratory qualitative study

#### **Aim**

The aim of this study is to explore the recovery experiences of adults with major and moderate non-neurological traumatic injuries after leaving Aberdeen Royal Infirmary

#### **Objectives**

Explore the experiences and perspectives of adults with major and moderate trauma regarding recovery and rehabilitation, including use of local rehabilitation services, ongoing limitations and rehabilitation needs, and return to work and leisure activities. Map the current patient journey in the north of Scotland for adults with major and moderate trauma after discharge from acute care, in terms of rehabilitation and recovery. Provide collated report to the North of Scotland Major Trauma

All interviews will be recorded on a secure audio recorder and then uploaded to a secure RGU server that is only accessible to the project team, which is GDPR compliant. The audio recordings will then be deleted from the recording device. All participants will be assigned a unique ID code to ensure anonymity. All reports written from this project will not use any identifiable information. Following good ethical processes, participants will be asked for their permission to record the interviews before they begin and this will also be stored on the secure RGU server

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## APPENDIX M – Caldicott Approval (CG/2022/157)

## APPLICATION FORM FOR CALDICOTT APPROVAL FOR USE OF PATIENT IDENTIFIABLE DATA

After completion please return this form to

Caldicott, Information Governance, NHS Grampian, Rosehill House, Foresterhill Site,  
Cornhill Road, Aberdeen AB25 2ZG

Email: [nhsg.caldicott@nhs.net](mailto:nhsg.caldicott@nhs.net)

**Project Title** Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of

Scotland

**Background:** Major trauma, defined as serious or multiple injuries where there is a high likelihood of death or permanent disability injuries, has a significant impact on individuals' short-term and long-term health outcomes. Previous research has focused on specific populations, such as traumatic brain injuries or spinal cord injuries, but not much is known about the experiences of recovery and rehabilitation for adults with non-neurological major and moderate traumatic injuries after they have left the acute care setting. Understanding the recovery and rehabilitation experiences of these individuals is crucial to the development and implementation of the rehabilitation and support services for this population. The North of Scotland Major Trauma Centre (NoSMTC) service would like to understand the experiences and recovery of patients to inform future service design. The aim of this service evaluation, therefore, is to explore the recovery experiences of adults with major and moderate non-neurological traumatic injuries after leaving Aberdeen Royal Infirmary.

The service evaluation will be carried out as part of a doctorate in physiotherapy (DPT) award by Laura Kromrey (NHS Grampian Physiotherapist) and supervised by Dr Angela Gall (Consultant in Rehabilitation Medicine, NHS Grampian), Professor

Kay Cooper (Clinical Professor, NHS Grampian & RGU) & Dr Lyndsay Alexander (Reader in Applied Health Research, RGU).

**Method:** The proposed service evaluation will be an exploratory qualitative study using a phenomenological approach. Patients who have been treated by the NoSMTC at Aberdeen Royal Infirmary (ARI) from April 2020 to December 2021 will be invited to take part in an interview.

Patients contact details will be accessed by NoSMTC clinical staff from the NoSMTC *Rehab Plan Database* and TrakCare. Staff will send out a letter of invitation and participant information sheet to patients. Patients can then contact the study team to take part in the interview. The contact information will be stored in the NHS Grampian network so a reminder invitation can be sent out one month later. Also, the patient CHI number will be noted to access the Injury Severity Score (ISS) for each patient. The ISS is a number that indicates injury severity for each patient, and we require this to accurately report participants' injury severity level in this service evaluation.

The NoSMTC Rehab Plan database is a live document that started in April 2020 for audit purposes for the North of Scotland Major Trauma Centre and is updated regularly by the clinical team. For this study, the date range of April 2020 to December 2021 for admission to ARI will be used.

Interviews will be conducted over the telephone or Microsoft Teams and securely recorded onto audio recorders. All recordings will be uploaded immediately after interviews to a secure Research drive (R:\drive) within the RGU server.

**Ethics and Dissemination:** This study has been confirmed as a service evaluation by the Health Research Authority and is registered with the NHS Grampian Quality Improvement & Assurance Team (Project ID 5791). Ethical approval will also be obtained from the School Research Ethics Committee (Ref: SHS/22/02), School of Health Sciences, RGU.

**Name of Applicant:** \_\_\_\_\_ Dr Lyndsay Alexander \_\_\_\_\_

**Address:** School of Health Sciences, Robert Gordon  
University, Garthdee Road, Aberdeen, AB10 7QG

---

**Tel No** 07814 497623

---

**Email address:** [l.a.alexander@rgu.ac.uk](mailto:l.a.alexander@rgu.ac.uk)

---

[l.kromrey@rgu.ac.uk](mailto:l.kromrey@rgu.ac.uk)

---

**Name of organisation receiving data: Robert Gordon University** \_\_\_\_\_

**and their Data Protection Registration Number: Z5607918** \_\_\_\_\_

**What patient identifiable information are you looking to use?**

<b>CHI Number</b>	<b>X</b>
<b>Forename</b>	<b>X</b>
<b>Surname</b>	<b>X</b>
<b>Initials</b>	
<b>Date of Birth</b>	
<b>Address</b>	<b>X</b>
<b>Postcode</b>	<b>X</b>
<b>Other, please specify: Injury Severity Score (ISS)</b>	<b>X</b>
<b>Age</b>	
<b>Gender</b>	



**How will the data be transferred?**

Paper records   
 Computer records

Potential participants will be identified from the North of Scotland Major Trauma Centre's patient database, the *Rehab Plan Database*, by the North of Scotland Major Trauma Centre clinical team. Data will remain within NHS Grampian network – staff will access patient contact details which will be saved within NHS Grampian NoSMTC files. The date of invitation letter being sent out and a 1-month reminder will be saved also. No patient data will be shared via email out with the NHS Grampian network.

*(Note – patient/user identifiable data must not be transferred via e-mail unless anonymised, encrypted or using secure NHS network i.e. nhs.net)*

**Who else will have access to the data?**

**(If data recipients are not employed by the NHS please state whether NHS honorary contracts are in place. If not – detail confidentiality agreements)**

Only the North of Scotland Major Trauma Centre clinical team will have access to patient data/contact details & CHI.

Staff specifically involved in the service evaluation are:

Laura Kromrey – Doctorate in Physiotherapy (DPT) student & NHS Grampian employee (Physiotherapist)

Dr Angela Gall\* – DPT supervisor & NHS Grampian employee (Consultant)

Dr Lyndsay Alexander – DPT supervisor & holds NHS Grampian Honorary contract

Jackie Burnett\* – DPT advisor & NHS Grampian employee (Physiotherapist)

Lesley Stables\* – DPT advisor & NHS Grampian employee (Physiotherapist)

Professor Kay Cooper – DPT supervisor and NHS Grampian employee (Clinical Professor)

\*- staff that are part of NoSMTC clinical team that will have access to *Rehab Plan Database* and TrakCare.

**How will the service users be contacted?**

A letter of invitation and Participant Information Sheet will be sent by post to patients. This will ensure that patient contact details remain within the NoSMTC/NHS Grampian network.

The invitation letter will provide an overview of the study, invite patients to take part, and state that participation is voluntary. The Participant Information Sheet details the purpose of the study and what patients can expect from taking part in the study.

Study contact details will be included in the letter of invitation and participant information sheet so that any interested patients can then contact the study team to take part.

<p><b>How will service users consent be obtained?</b></p> <p>Patients that take part in the interviews will be asked to provide their verbal informed consent before the interview begins. This will be audio-recorded on a secure hand-held password protected voice-recorder. The recording will then be transferred for storage to a secure research drive within the RGU server accessible by only the DPT supervisory team and student.</p>
<p><b>If no consent being obtained, please detail the reason why not?</b></p> <p>N/A</p>
<p><b>Where will the data be stored?</b></p> <p>Patient contact details, CHI and ISS will be stored within the NHS Grampian network. Patient verbal consent, audio recorded interviews and analysis will be stored on a secure research drive (R:\drive) within the RGU server. This is protected by a secure login and only the DPT supervisors and student named above will have access to it.</p> <p>To process/analyse the data the named researchers (above) will download the Excel/SPSS files to password-protected university PCs. On completion of data analysis any local files will be deleted.</p> <p>At no time will data be stored on portable devices (laptops/USBs).</p>
<p><b>How will the data be protected? (Please detail security measures to be taken)</b></p> <p>The data will be stored on a GDPR-compliant platform, only accessible to the named DPT student and supervisors, via their RGU login and password.</p>
<p><b>If the data is on a computer is there access via a network?</b></p> <p>Access is via a network, but this is password protected with secure login.</p>
<p><b>How long will the data be stored?</b></p> <p>Data will be stored until the end of the DPT registration (June 2023).</p>
<p><b>At the end of this period, how will the data be disposed of?</b></p> <p>Data will be deleted at the end of this period.</p>
<p><b>Who will be responsible for ensuring that the data is disposed of in a confidential manner?</b></p> <p>Dr Angela Gall – NHS Grampian stored excel sheet information Dr Lyndsay Alexander – RGU stored data</p>

***Please refer to the last page for the six Caldicott Principles before answering the questions below.***

**Q.1 What is the purpose for which data are to be used? (Principle 1)**

To evaluate the NoSMTC patient recovery post-discharge from ARI and inform future service development.

The data will help us explore the recovery experiences of adults with major and moderate non-neurological traumatic injuries after leaving Aberdeen Royal Infirmary.

**Q.2 Why is it necessary to use identifiable data? (Principle 2)**

This project aims to recruit patients from a specific traumatic injury population (i.e. moderate or major traumatic injury, managed through the North of Scotland Major Trauma Centre). The *Rehab Plan Database* was identified as the only option for accessing this population as there is no physical ward within ARI that manages these patients. The patients can be spread around different wards and specialities within ARI, so the database is the only way to identify these patients. As the *Rehab Plan Database* does not include current mailing addresses, it is necessary to use TrakCare for contact information.

Patient contact information (name, address and postcode) is required to enable posting out of invitation letters to patients.

Patient name & CHI is required to access ISS.

ISS is required to identify the severity of injury for individual patients for accurate reporting of participant demographics.

**Q.3 Justify the use of each patient-identifiable data field (Principle 3)**

Name, address, and postcode: Patients will be posted out an invitation letter and information sheet and so requires this information.

CHI: CHI number required to identify patient address and injury severity score.

No other identifiable data is required.

**Q.4 Who will have access to patient-identifiable information and what control will there be? (Principle 4)**

The North of Scotland Major Trauma Centre clinical team will have access to the data described above.

Controls include secure storage of data within NHS Grampian network, limited access (named individuals only), use of data for conducting service evaluation only and providing a report to NHS Grampian NoSMTC staff and submitting the DPT thesis.

**Q.5 Outline actions taken to ensure individuals with access to patient identifiable information are aware of their responsibilities and obligations to respect patient confidentiality (Principle 5)**

The North of Scotland Major Trauma Centre clinical team will be given a recruitment protocol detailing the information required. The clinical team are familiar with conduct of handling patient-identifiable information as this is part of their role as health care professionals and delivering usual care. All health professionals are required to adhere to their governing body standards which include patient confidentiality.

The study team will follow the UK policy framework for health and social care research (NHS Health Research Authority 2022). All data collected will be recorded, handled and stored appropriately and confidentially in accordance with the General Data Protection Regulation (UK Government 2018).

**Q.6 Outline the organisational arrangements for complying with legal requirements (Principle 6)**


The North of Scotland Major Trauma Centre clinical team will comply with the General Data Protection Regulation when accessing, and handling patient identifiable information.

RGU arrangements all comply with legal requirements including GDPR and data protection regulation.

**I confirm that the data will be held and used according to the condition and information given as described with this approval form.**

**Applicant: Dr Lyndsay Alexander**

**Job Title: Reader in Applied Health Research**

**Signature:**  **Date:**  
**4/11/2022**

FOR OFFICE USE ONLY

**Data Protection Act compliant**    **Yes**        **No**   

Comments:


Information Governance Manager: Mr Chris Morrice

Signature .....    Date .....

**Authorisation Granted**    **Yes**        **No**   

Comments:

Caldicott Guardian (NHS Grampian): Dr Nick Fluck, Medical Director, NHS Grampian

**Signature**  **Date** 23<sup>rd</sup> November 2022

1. The data received from NHS Grampian will be treated as confidential
2. The data received from NHS Grampian will be used only for the purpose(s) described
3. In the case of anonymised or confidential aggregated data, no attempt will be made to identify or contact individuals or organisations identified through this data.
4. The data received from NHS Grampian may be disclosed to staff of the above organisation but only for the described purpose(s)
5. The data received from NHS Grampian may not be disclosed to any third party
6. The data received from NHS Grampian will be stored in secure conditions at all times whether held in electronic medium or as printed hard copies
7. The organisation to which the data is released will maintain and comply with a Data Protection Registration which encompasses the data and data storage usage
8. The data will be destroyed when the work is completed: any printed copies will be destroyed, and files deleted from computer systems (including any copies held on backup or archive media)

All staff given access to data will be made aware of these conditions (Principle 5).

## Caldicott Guardian Principles

### 1. Justify the purpose(s)

Every proposed use or transfer of patient-identifiable information within or from an organisation should be clearly defined and scrutinised, with continuing uses regularly reviewed by an appropriate guardian.

### 2. Don't use patient-identifiable information unless it is absolutely necessary.

Patient-identifiable information items should not be used unless there is no alternative.

### 3. Use the minimum necessary patient-identifiable information.

Where use of patient-identifiable information is considered to be essential, each individual item of information should be justified with the aim of reducing identifiability.

### 4. Access to patient-identifiable information should be on a strict need to know basis.

Only those individuals who need access to patient-identifiable information should have access to it, and they should only have access to the information items that they need to see.

### 5. Everyone should be aware of their responsibilities.

Action should be taken to ensure that those handling patient-identifiable information – both clinical and non-clinical staff – are aware of their responsibilities and obligations to respect patient confidentiality.

### 6. Understand and comply with the law

Every use of patient-identifiable information must be lawful. Someone in each Organisation should be responsible for ensuring that the organisation complies with legal requirements.

APPENDIX N – Letter of Invitation



SREC Reference No: SHS/22/02

School of Health Sciences  
Robert Gordon University  
Garthdee Road, Aberdeen  
AB10 7QG

**LETTER OF INVITATION**

**Study title:** Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland

Dear

My name is Laura Kromrey and I am a doctoral research student at Robert Gordon University. I am writing to invite you to participate in a study on the recovery and rehabilitation experiences of adults after moderate and major traumatic injuries. You have received this letter because the North of Scotland Major Trauma Network has identified you as someone who received treatment for a major or moderate traumatic injury from this network.

This study was created in partnership between the North of Scotland Major Trauma Network rehabilitation team and the School of Health Sciences at Robert Gordon University. We are interested in learning more about the recovery and rehabilitation experiences of patients after they leave the hospital to inform how the service can develop in the future.

For this study, you are invited to take part in one interview which should last no more than one hour. The interview would be arranged on a date and time of your choosing.

Please find enclosed a 'Participant Information Sheet' for more details about the study. Your involvement in this study is voluntary and your responses will be kept confidential.

If you are interested in taking part in this study, please read through the 'Participant Information Sheet' to learn more about the study and how you can be involved.

Kind Regards,

A handwritten signature in black ink, appearing to read 'Laura Kromrey'.

Laura Kromrey

Doctorate of Physiotherapy Student

Email: [Recovery\\_after\\_trauma@rgu.ac.uk](mailto:Recovery_after_trauma@rgu.ac.uk)

Recovery Experiences After Traumatic Injury / Letter of Invitation / V1.0 / 07.10.22

APPENDIX O – Participant Information Sheet

SREC Reference No: SHS/22/02

**PARTICIPANT INFORMATION SHEET**



**Study title:** Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland

You are being invited to take part in a study. Before you decide, it is important for you to understand why this study is being done and what it will involve. Please read the following information carefully and discuss it with others if you wish. You can ask us if anything is not clear or if you would like more information. Thank you for reading this information sheet.

***What is the purpose of this study?***

The purpose of this study is to learn about the recovery and rehabilitation experiences of people who have experienced traumatic injuries. Traumatic injuries can have an impact on many areas of a person's life, such as the ability to carry out daily activities, return to previous activities like work and hobbies, and general wellbeing.

The rehabilitation team for the North of Scotland Major Trauma Network is interested in learning more about the recovery and rehabilitation experiences of patients after they go home from Aberdeen Royal Infirmary (ARI) following a traumatic injury. We are asking people to take part in one interview to share their experiences, as this will provide valuable information on how current services are being used and other services needed for people coming home from hospital after a traumatic injury. We will use the findings from this study to create a report that will be shared with the North of Scotland Major Trauma Network and the wider Scottish Trauma Network. These findings have the potential to influence the development of future support and services for adults with traumatic injuries in the north of Scotland.

***Why have I been invited?***

We are looking to speak to adults that have been an in-patient at Aberdeen Royal Infirmary after a traumatic injury since April 2020. You have been identified as someone who was treated by the major trauma team at Aberdeen Royal Infirmary following your injury.



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You are eligible to take part if you are:

- Aged 18 years or older at time of injury
- Have sustained a traumatic injury such as (multiple fractures, chest or abdominal injuries, or other serious injuries)
- Were treated at Aberdeen Royal Infirmary following your injury

***Do I have to take part?***

No, it is up to you to decide whether to take part. If you decide to take part, you will be asked to read this information sheet and provide your consent before participating in an interview. If you decide to take part, you are free to withdraw at any time and without giving a reason which will not impact on any ongoing medical care you may be receiving.

***What does taking part in this study involve?***

Taking part in this study involves participating in one interview with a member of the study team. The interview is not expected to last more than one hour, but might be shorter or longer depending on how much you would like to share. Interviews will take place on a video call (using Microsoft Teams) which can be accessed on most electronic devices or computers (i.e. mobile telephones, tablet devices, laptop or desktop computers), but a telephone interview can be arranged if you prefer. With your permission, the interview will be audio-recorded and then analysed by the study team.

Before the interview, we will send you information about the questions we would like to ask during the interview about your experiences of recovery and rehabilitation following your injury. We will also send you a template of a timeline we would like to use during the interview to help discuss your recovery and rehabilitation over time. There are no right or wrong answers in the interview, we are very interested to hear about all experiences.

***What are the possible benefits and risks of being in this study?***

Taking part in this study will not benefit you directly. Some people may benefit from sharing their experiences and providing feedback on services and support used during the recovery and rehabilitation after traumatic injuries. The overall findings from this study will be fed back to the North of Scotland Major Trauma Network, which we hope will provide useful information to inform future development of support and services for adults after traumatic injuries in Scotland.

We do not anticipate any risks from taking part in this study. There is a possibility that thinking or speaking about your experiences may cause some discomfort or distress. If this happens during the interview, we can pause and take a break. We

SREC Reference No: SHS/22/02

will also provide you with contact information for sources of support following the interview. You do not have to answer any questions that you do not wish to answer, and you are free to end the interview at any time.

***Will my taking part in the study be kept confidential?***

Yes. If you decide to take part, your name and contact details will be stored securely on a password-protected file and will only be used for the purpose of contacting you about the interview. We will not use your name in any of the study data, instead you will be given a unique identification code (ID code) to ensure your anonymity. The interview will be recorded (audio only using a hand-held voice recorder) and a transcript of the interview will be produced by the research team. We will not use your name in the transcript (just the ID code), only the study team will see the transcript and it will not be shared with anyone else. All information will be collected and stored within the requirements of the General Data Protection Regulation (UK Government 2018), please see further information on the last page of this information sheet. We will use anonymised quotes from the interview to illustrate study findings in papers and reports, but it will not be possible to identify you from any of these quotes.

Robert Gordon University is the sponsor for this study and is based in Aberdeen, United Kingdom. We will be using information from you to undertake this study and Robert Gordon University will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. Robert Gordon University will keep identifiable information about you for 10 years after the study has finished.

***What will happen to the results of the study?***

The findings from this study will be written up as part of a Doctoral thesis. The findings will also be included in a report that will be shared with the North of Scotland Major Trauma Network rehabilitation team and the wider Scottish Trauma Network. This report will provide insight into the current experiences of adults recovering from a traumatic injury, with the aim to inform the development of future support and services for adults with traumatic injuries in the north of Scotland. The results will also be published in a trauma care or physiotherapy-related journal and presented at a professional conference. You will not be identified in any reports or publications. We will also send you a summary of the findings and how the information you provided is being used (please note it may be some time before this is available).

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**Who is organising and funding the study?**

This study is being conducted by Laura Kromrey in part-fulfilment of a Doctorate of Physiotherapy. She is supervised by Dr Lyndsay Alexander, Reader in Applied Health Research from the School of Health Sciences, Robert Gordon University. This study was designed in collaboration with the North of Scotland Major Trauma Network’s rehabilitation team.

**Who has reviewed the study?**

All studies by Robert Gordon University are looked at by an independent group called a Research Ethics Committee, to protect your interests. The School of Health Sciences Research Ethics Committee (SREC No: SHS/22/02) and NHS Grampian Caldicott Guardian (CG/2022/157) have approved this study. This study is also registered with the NHS Grampian Quality Improvement & Assurance Team (Project ID 5791).

**What do I do now?**

If you are interested in taking part, you can sign up for an interview by one of the following ways:

- ❖ Scan QR code below (or use link), which will direct you to a form to provide your contact information and preferred date and time for an interview.
- ❖ Email [Recovery\\_after\\_trauma@rgu.ac.uk](mailto:Recovery_after_trauma@rgu.ac.uk) the following information:
  - Your name
  - Contact phone number
  - Preferred day of week and time of day for interview
- ❖ Call **01224 263264** and leave a message with your name and contact number, for interest in the "Recovery Experiences After Traumatic Injury" study
- ❖ Fill out the enclosed form and return in the pre-labelled return envelope by post.



<https://robertgordonuniversity.onlinesurvey.ac.uk/recovery-experiences-after-trauma>

**Contacts for further information**

Research Student	Principal Supervisor
Laura Kromrey Doctorate of Physiotherapy Student Email: <a href="mailto:Recovery_after_trauma@rgu.ac.uk">Recovery_after_trauma@rgu.ac.uk</a>	Dr Lyndsay Alexander Reader in Applied Health Research Email: <a href="mailto:l.a.alexander@rgu.ac.uk">l.a.alexander@rgu.ac.uk</a> Telephone: 01224 263264

SREC Reference No: SHS/22/02

**Data Protection Statement**

Robert Gordon University (RGU) is sponsoring this study. This section explains how we (RGU) will use information about you for the purposes of this study.

***How will we use the information we collect about you?***

We will need to use information from you for this study. This information will include:

- Age
- Gender
- Education
- Ethnicity
- Injury Severity Score

People will use this information to do the study or to check your records to make sure that the study is being done properly. People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead. We will keep all information about you safe and secure. Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

***What are your choices about how your information is used?***

- You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.
- We need to manage your records in specific ways for the study to be reliable. This means that we won't be able to let you see or change the data we hold about you.
- If you agree to take part in this study, you will have the option to take part in future studies using your data saved from this study stored anonymously on RGU's research repository OpenAir.

***Where can you find out more about how your information is used?***

You can find out more about how we use your information

- at [www.hra.nhs.uk/information-about-patients/](http://www.hra.nhs.uk/information-about-patients/)
- by asking one of the study team (contact above)
- Our leaflet available from <http://www.hra.nhs.uk/patientdataandresearch>
- by sending an email to Robert Gordon University's Data Protection Officer ([DP@rgu.ac.uk](mailto:DP@rgu.ac.uk))

***What if there is a problem with the study?***

If you have any complaint about the conduct of this study, you should contact the Convenor, School of Health Sciences Research Ethics Committee, Robert Gordon University ([SREC@rgu.ac.uk](mailto:SREC@rgu.ac.uk)) or Mrs Laura Binnie, Dean of School, School of Health Sciences ([l.m.binnie@rgu.ac.uk](mailto:l.m.binnie@rgu.ac.uk)).

**APPENDIX P - Paper Response Form**

**Recovery Experiences After Traumatic Injury Study**

Thank you for reading the study *Participant Information Sheet* and deciding to take part in this study. Please provide the following information and return in post using the included pre-labelled return envelope. A member of the study team will contact you to provide information about the study, answer any questions, and arrange a time and date for an hour-long interview.

**Full name:** \_\_\_\_\_

**Contact phone number:** \_\_\_\_\_

**Email:** \_\_\_\_\_

*Please select all that apply, final date and time to be confirmed during initial phone call.*

**Ideal day of week for interview:**

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

**Ideal time of day for interview:**

- Morning (8 am - 12 pm)
- Afternoon (1 pm - 5 pm)
- Evening (6 pm - 8 pm)

**Thank you!**

-----  
**Recovery Experiences After Traumatic Injury Study**

Thank you for reading the study *Participant Information Sheet* and deciding to take part in this study. Please provide the following information and return in post using the included pre-labelled return envelope. A member of the study team will contact you to provide information about the study, answer any questions, and arrange a time and date for an hour-long interview.

**Full name:** \_\_\_\_\_

**Contact phone number:** \_\_\_\_\_

**Email:** \_\_\_\_\_

*Please select all that apply, final date and time to be confirmed during initial phone call.*

**Ideal day of week for interview:**

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

**Ideal time of day for interview:**

- Morning (8 am - 12 pm)
- Afternoon (1 pm - 5 pm)
- Evening (6 pm - 8 pm)

**Thank you!**

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## APPENDIX Q – Timeline Template

SREC Reference No: SHS/22/02

### Timeline Exercise and Template

Before the interview, we invite you to reflect on your experiences related to your recovery and rehabilitation so far. You can use this timeline template to make notes of services, support, or other things you used or found important, as well as any barriers or challenges you may have experienced. This is only a template, please feel free to use an approach that works for you (i.e. notes, brainstorm map, etc.). Below is a list of topics that will be covered in the interview, but please add anything else that you feel has been important to your recovery. Only share what you are comfortable with and know that you are free to stop the interview without giving a reason at any time. During the interview, we can use the template below to create a timeline since your return home from Aberdeen Royal Infirmary.

Some areas we are interested in learning more about include:

- Rehabilitation or support services used
  - o Type of service (i.e. physiotherapy, occupational therapy, psychology)
  - o How long you attended for
- Return to work/vocational activities (i.e. work, education, training)
- Return to leisure activities (i.e. hobbies, sports, personal activities)
- Personal milestones in your recovery journey



	A : 4. Communication with HCPs	B : 5. Information provision	C : Sources of information
<p>10 : 2</p> <p>Age = 55 Gender = Female ISS = 17 Time after injury = 1 y...</p>	<p>After she requested more dihydrocodeine at GP, pharmacy followed up with phone call saying that she needed to start weaning herself off it. She found it nice to have that follow up and that they were checking up and making sure that everything was all right.</p>	<p>Osteopath/pilates instructor - 1:1 recovery programme After hospital discharge, she was going backwards and forwards with her thumb injury. She received information and follow up from the hand fracture clinic. Information from pharmacy on weaning - see section A. Consultant advised on recovery of thumb injury - 'never go back to as strong as it used to be' Psychology visited in hospital and provided all the paperwork and all their cards, so she could have contacted them at any point.</p>	<p>Pilates teacher - contacted as soon as she came out of hospital Pharmacist - weaning from analgesia advise Self - researched exercises for thumb Consultant at fracture clinic - recovery on thumb injury exercises/prognosis (see section B)</p>
<p>11 : 1</p> <p>Age = 58 Gender = Female ISS = 13 Time after injury = 1 y...</p>	<p>She reported that she 'clicked' with the doctor and understood what he was saying and it made complete sense. <i>So lots of things he said were great words and made an awful lot of sense to me.</i></p>	<p>Pain medication explained at the hospital and it made sense, warned about pain levels and needing to take strong pain killers Physiotherapy for advise on wearing the sling, how to hold herself, helpful advise on using towel, encouraged movement in injured limb, exercises with simple diagrams Felt like she was given enough information and she also liked to look into things herself for what she could do. Also thinks if you get too much information, it can be overload for some people - <i>Yeah, there's a lot going on and if you get too much it's 'oh goodness'. Because</i></p>	<p>Physiotherapy - see section B Doctor from trauma team - information on return to work Consultant clinical psychologist Major Trauma Community Psychology Service - psychology information- see section B</p>
	<p>With self-rehabilitation plan,</p>	<p>Able to phone the ward reception and ask</p>	<p>Hospital staff - see section A and B</p>

**APPENDIX R – Demographic Questions**

The following questions will be asked at the start of the interview. This sheet is provided as a reference for you to use during the interview.

1. What age are you today? \_\_\_\_ years
  
2. What is your gender?
  - a) Female
  - b) Male
  - c) Other: \_\_\_\_\_
  - d) Prefer not to say
  
3. How would you describe your traumatic injury(s)? (please select all that apply)
  - a) Fracture(s) on upper body (i.e. shoulder, arms, hands)
  - b) Fracture(s) on lower body (i.e. pelvis, legs, feet)
  - c) Rib fracture(s)
  - d) Spinal fracture(s)
  - e) Head injury
  - f) Abdominal injuries (i.e. injury to internal organ(s))
  - g) Chest injuries (i.e. lungs, heart)
  - h) Burns/skin damage
  - i) Other: \_\_\_\_\_
  
4. What was the cause of your traumatic injury? (i.e. road traffic accident, fall, etc.)  
  
\_\_\_\_\_
  
5. What was the date of your traumatic injury?  
  
\*Day \_\_ \_\_ **Month** \_\_ \_\_ **Year** \_\_ \_\_ (\*day is optional)
  
6. How would you describe your current situation?
  - a) Self employed
  - b) Employed full time
  - c) Employed part time
  - d) Looking after the home or family
  - e) Permanently retired from work
  - f) Unemployed and seeking work
  - g) At school
  - h) In further/higher education
  - i) Government work or training scheme
  - j) Permanently sick or disabled
  - k) Unable to work due to short-term illness or injury
  - l) Other: \_\_\_\_\_



7. What is your highest level of education?
- No formal qualifications
  - National 5/O-level or equivalent
  - Higher/A-level or equivalent
  - Degree level e.g. BSc, BA
  - Master's Degree level e.g. MSc, MA
  - Doctorate
  - Other: \_\_\_\_\_
8. What is your postcode? \_\_\_\_\_
9. Which option best describes your ethnicity?
- White**
    - Scottish
    - Other British
    - Irish
    - Gypsy / Traveller
    - Polish
    - Other white ethnic group
  - Mixed or multiple ethnic groups**
    - Any mixed or multiple ethnic groups
  - Asian, Asian Scottish or Asian British**
    - Pakistani, Pakistani Scottish or Pakistani British
    - Indian, Indian Scottish or Indian British
    - Bangladeshi, Bangladeshi Scottish or Bangladeshi British
    - Chinese, Chinese Scottish or Chinese British
    - Other
  - African**
    - African, African Scottish or African British
    - Other
  - Caribbean or Black**
    - Caribbean, Caribbean Scottish or Caribbean British
    - Black, Black Scottish or Black British
    - Other
  - Other ethnic group**
    - Arab, Arab Scottish or Arab British
    - Other
  - Prefer not to say**

APPENDIX S – Mental Health Resources

**Mental Health Resources**

Some people may find some of the topics covered in this interview distressing. Below are some resources that are available if you need to talk to someone.

**Need to talk?**

If you just want to talk to someone about how you're feeling or what you're experiencing, you can contact the following services for support:

**Samaritans** are available to talk about anything that's troubling you, no matter how large or small the issue. You don't have to be suicidal. Call: **116 123**. Lines are open 24 hours a day, 365 days a year. For more information: <https://www.samaritans.org/>

**Breathing Space** have experienced advisors will listen and offer information and advice. Helpline number: **0800 83 85 87** Opening hours: Weekdays: Mon-Thurs 6pm to 2am. Weekend: Friday 6pm - Monday 6am. For more information: <https://breathingspace.scot/>

**Shout** is a free text service that provides immediate support for all types of mental health challenges. Text SHOUT to **85258** to chat by text to a trained and supervised volunteer. Free, confidential, and available 24 hours a day, 365 days a year. For more information: [www.giveusashout.org](http://www.giveusashout.org)

**NHS Inform** has information on identifying, treating, and managing mental health issues. Includes information on mental health support through the NHS and self-help guides. For more information: [www.nhsinform.scot/illnesses-and-conditions/mental-health](http://www.nhsinform.scot/illnesses-and-conditions/mental-health)



**If you would like further information on available services and support for recovering from a traumatic injury, the following resources may be of use:**

**AfterTrauma** - <https://www.aftertrauma.org/>

**Day One Trauma Support** - <https://www.dayonetrauma.org/>

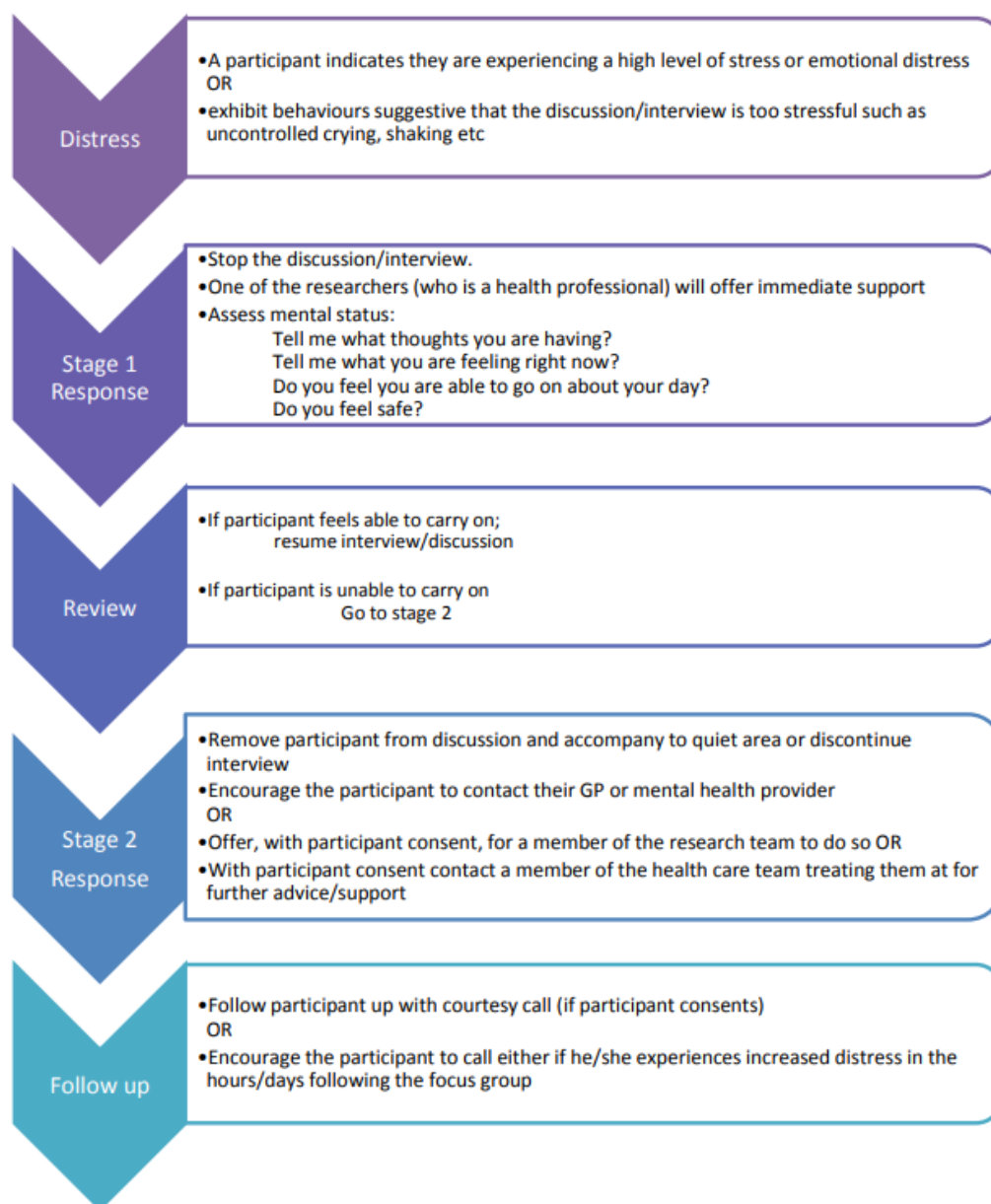
## APPENDIX T – Mental Health Escalation Plan

### Distress Policy - Participant

For during interviews:

- “Is there someone with/near you that you feel comfortable speaking with?”
- Mental health support resources sheet

**Distress Protocol 1:** The protocol for managing distress in the context of a research focus group /interview  
 (Modified from : Draucker C B, Martsof D S and Poole C (2009) Developing Distress Protocols for research on Sensitive Topics.  
*Archives of Psychiatric Nursing* 23 (5) pp 343-350 )



(Haigh and Witham 2015)

**Distress Protocol for Researcher**

<b>Action</b>	<b>When</b>	<b>Completed/Notes</b>
<b>Mental Health First Aid course</b>	Prior to data collection	Course completed - Jan 26-27, 2023
<b>Interview preparation</b>	Prior to data collection	Mock interviews (3 mock participants) Reflexive practice – narrative autobiography, self-interview with interview guide
<b>Monitoring wellbeing throughout interviews</b>	During interviews	Aim to have time before interview to get settled and set up, check in with self throughout interview (reminder on interview topic guide)
<b>Debrief with supervisor(s)</b>	After initial/challenging interviews	Supervisor aware of every interview Schedule quick catch up with supervisor after initial interviews/challenging interviews
<b>Using research journal</b>	Throughout preparation, data collection/analysis	Write in research journal after interviews and throughout data analysis Note if any interviews are “difficult” – warning for transcription stage

## APPENDIX U – Interview Topic Guide

**Study title:** Exploring recovery and rehabilitation experiences of adults with major and moderate non-neurological traumatic injuries in the north of Scotland

### Interviews with adults after major/moderate traumatic injuries

Welcome – *thank you again for agreeing to participate in this study.*

*My name is Laura, currently completing by DPT degree. My research is looking into the experiences of people after traumatic injuries in the NoS and this past year I've been working with the NoS MTN to design this study. (some background...)*

Explain purpose of interview – *the reason why this project was created is because...*

- *The North of Scotland Major Trauma Network is interested in learning more about patients' experiences after they went home from the hospital after an injury.*
- *The North of Scotland Major Trauma Network system started in 2018 with the aim to improve patient care following a serious injury. With this study, we are hoping to learn more about your experiences on your recovery journey.*

### I: Housekeeping

- Explain how confidentiality & anonymity will be ensured
  - *All of your information will be kept safely and securely.*
  - *Your name and any identifiable information will be kept separate from your responses.*
- *With your permission, interviews will be recorded on a separate device.*
- *I will listen back to our conversation, write it up into a transcript, and it will be deleted from this device*
- *Remind of length of interview (should last to up an hour)*
- *During this interview, we are going to use a **timeline** to discuss your recovery journey so far. I will share my screen and I will add sticky notes with important dates or events to guide the conversation.*
- **Signposting of resources** - *There is a possibility that thinking or speaking about your experiences may cause some discomfort, but if this happens, we will pause and take a break. I have also provide you with contact information for sources of support in the meeting invitation email. Also remember that you do not have to answer any questions that you do not wish to answer, and you are free to end the interview at any time.*
- *Any questions?*
- *Audio recording & notes –Your responses are important, so I will be taking notes throughout the interview, so if you see me looking off the screen, I am making sure to I'm capturing all you're telling me - **Are you happy for me to start recording?***

**\*Switch ON voice-recorder**

### II: Consent

**This is consent for Participant \_\_\_.**

**\*\*Switch OFF voice-recorder → \*\* Press New File button\*\***

**\*Switch ON voice-recorder**

### III: Demographic Information

*This is the interview for Participant \_\_\_.*

#### 1. Can I start off by asking you some background questions?

\*Share demographic questions on screen – 150% zoom

- Age
- Gender
- Type of injury(s)
- Cause of injury(s)
- Date of injury
- Current vocational status
- Highest education level
- Postcode
- Ethnicity

### IV: Interview starts

Demonstration of Teams Whiteboard with timeline template and example of how to add events

\*Share Teams Whiteboard on screen

- adjust size on screen in bottom of screen on right-hand side (with the magnifying glasses)
- I'll just be adding notes as we go

#### 2. Can you tell me about your recovery journey, starting from when you left Aberdeen Royal Infirmary after your injury/(injuries)?

Prompts:

- Services accessed/referred for
  - o What, where, how long
  - o Self-referred, referred by GP/other HCP
- Information on recovery
  - o Provider
  - o Resources, services, websites, etc.
- Support
- Facilitators/barriers to recovery?
  - o Things that helped/negatively impacted your recovery
- Pain management
- Impact of Covid/lockdowns on recovery?

#### 3. Have you been able to resume your prior vocational activities? (i.e. work, education, sport, training) (\*\*depending on answer to vocational question in demographic information)

Prompts:

- Full return/with modifications?
- Facilitators/barriers to your return to vocational activities?
  - o Things that helped/negatively impacted your return to ...

- **Current goals** relating to vocational activities?

**4. Have you been able to resume your prior recreational activities? (i.e. hobbies, sport, personal/social activities)**

Prompts:

- Modifications?
- Facilitators/barriers to your return to recreational activities?
  - o Things that helped/negatively impacted your return to ...
- Impact on enjoyment/interest
- Impact of injury on social participation?

**5. Do you feel you have any ongoing limitations from your injury?**

Prompts:

- Ability to complete day-to-day tasks
- Any other areas of limitation (other than physical?)
  - o Social, work, etc.
- If you were to rate your overall physical function today, with 100% being prior to the injury?
  - o Can you tell me more about that?

**6. Next, I would like to ask you some questions about your health using an outcome measure that measures quality of life.** (this has a small blurb I need to read at the beginning)

\*Share EQ-5D on screen

**EQ-5D-5L Interviewer administration – Introduction**

**We are trying to find out what you think about your health. I will explain what to do as I go along, but please interrupt me if you do not understand something or if things are not clear to you. There are no right or wrong answers. We are interested only in your personal view.**

**First, I am going to read out some questions. Each question has a choice of five answers. Please tell me which answer best describes your health TODAY.**

**Do not choose more than one answer in each group of questions.**

*(Note to interviewer: first read all five options for each question. Then ask the respondent to choose which one applies to him/herself. Repeat the question and options if necessary. Mark the appropriate box under each heading. You may need to remind the respondent regularly that the timeframe is TODAY.)*

### EQ-5D VAS

- **Now, I would like to ask you to say how good or bad your health is TODAY.**
- **I would like you to picture in your mind a vertical line that is numbered from 0 to 100.**  
*(Note to interviewer: if interviewing face-to-face, please show the respondent the VAS line.)*
- **100 at the top of the line means the best health you can imagine.**  
**0 at the bottom of the line means the worst health you can imagine.**
- **I would now like you to tell me the point on this line where you would put your health TODAY.**  
*(Note to interviewer: mark the line at the point indicating the respondent's health today. Now, please write the number you marked on the line in the box below.)*

**Thank you for taking the time to answer these questions.**

**\*After last question** – “Thank you for sharing. If you are finding things difficult right now, there are resources available to you. I sent a document with resources through with the meeting invite, but am happy to send again/go through at end of the interview.”

Prompts:

- Are there any of those answers you would like to reflect on?
- Can you tell me more about that?

### **7. Looking back, what kind of support did you find the most useful (or what would have been the most useful) to you:**

- **In the first month? (after discharge from hospital)**
- **In the first 3 months? (after discharge from hospital)**
- **At this time?**

Prompts:

- Charities, social networks
- Local services from NHS
- Services from the NoS MTC

**\*Share Teams Whiteboard on screen**



## V: Ending the interview

(Review answers/ ensure these have been documented accurately – dates for services)

- Is it alright if I save a copy of this timeline we created?
- You've shared some really valuable ideas/interesting things about your experiences of your recovery journey.
- Closer question:
  - What do you think has been the most significant part of your recovery journey so far?
  - What do you think is the most important thing you've told me today?
- Is there anything that we haven't covered that you think is important for me to know about your experiences? / Any questions?

**\*STOP sharing Teams Whiteboard on screen**

## \*\*Switch OFF voice-recorder

- *Thank you again for taking part in this interview and providing valuable information on your experiences.*
- *I also want to remind/reassure you that the information and responses you have provided today will remain confidential and stored safely/securely*
- *Use - Once I've completed all the interviews, the transcripts will be used by the research team to build a report of important topics that are raised, which I will use for writing up my degree as well as a report to the local trauma network service*
- *We are offering to send a **summary of the results** to participants*
  - *Would you be interested in this?*
  - Available summer 2023 at earliest
  - How to contact them - email, post
- Signposting of resources (see Mental Health Resources)
  - *How are you feeling?*
  - *Do you have much else on today? (check they are able to continue with day)*
- Any final questions?

APPENDIX V – Reflexivity Plan

<b>Reflexive Practice</b>	<b>Description</b>	<b>When</b>
<b>Narrative autobiography</b>	Initial perspectives on 4 dimensions (prior to data collection). Share and discuss with supervisor.	Prior to data collection
<b>Self-interview</b>	Record assumptions, perspectives, expectations for interview guide questions.	Prior to data collection
<b>Field notes of interviews</b>	Paper notes during interview. Decisions, context, power dynamic, general themes and self-debrief.	After each interview
<b>Reflection on initial self-interview</b>	Reflect on initial assumptions, perspectives, expectations.	Half-way through data collection After data collection After data analysis
<b>Reflection on narrative autobiography</b>	Reflect on perspectives on 4 dimensions.	During/after data analysis

## APPENDIX W – Qualitative Findings: Categories, Classes, and Themes

Categories	Classes	Themes
Initial Physical Impairments	Physical recovery experiences	<b>Theme #1: Management of physical impairments and psychological aspects throughout recovery</b>
Physical Impairment: Milestones		
Enduring physical impact of injury		
Impact of age/aging		
Intrapersonal changes following injury	Psychological recovery experiences and recovery mindset	
Perspectives and expectations about progress throughout recovery		
Pragmatic recovery mindset		
Psychological wellbeing and challenges		
Impact of other life events during recovery		
Pain experiences during recovery	Pain management and experiences	
Pain management strategies		
Information provision for pain management		
Initial experiences of time at home	Initial experiences of time at home	
Experiences with adaptations: equipment, aids, and environmental adaptations	Functional recovery experiences	
Initial Limitations with mobility, ADLs, and functional tasks		
Milestones during recovery: activities and participation		
Resuming prior activities		
Enduring functional impact of injury		
Rehabilitation activities and experiences	Rehabilitation experiences during recovery	
Self-management in rehabilitation		
Employment status following injury	Return to work experiences	
Return to work experiences		
Facilitators and challenges with returning to work		
Perspectives on using and asking for assistance	Support throughout recovery	

Sources and types of assistance/support		<b>Theme #3: Support, services, and wider impact of injury throughout recovery</b>
Support used at 1 month		
Support used at 3 months		
Support used currently		
Impact of injury on partner/family	Wider impact of injury	
Comments from others on injury		
Perspectives of Trauma Team	Experiences with services and follow up	
Experiences of using follow up services		
Logistics of accessing services		
Follow up services accessed: NHS		
Follow up services accessed: private		
Follow up services accessed: Other		
Communication with HCPs	HCP Information provision and communication during recovery	
Information provision during recovery		
Sources of information		
Uncertainty about recovery		

**APPENDIX X – Qualitative Findings: Dimensions, Categories, and Class Example**

## Functional Recovery Experiences

Dimensions	Categories	Classes
Equipment provided on D/C	Experiences with adaptations: equipment, aids, and environmental adaptations	Functional recovery experiences
Equipment from other sources (insurers, self-funded)		
Mobility equipment		
Equipment – none needed		
Environmental modifications for initial reduced mobility		
Perspectives on initial mobility/use of aids		
Perspectives on wearing casts/braces		
Challenges to living in own environment		
Perspectives on adaptations		
Initial Limitation: Mobility	Initial Limitations with mobility, ADLs, and functional tasks	
Initial Limitation: Stairs		
Initial Limitation: ADLs		
Initial Limitation: Functional tasks		
Initial Limitation: Restricted driving		
Initial Limitation: Variable functional ability		
Initial Limitation: Tasks took a long time	Milestones during recovery: activity and participation	
Milestones: Resuming driving		
Milestones: ADLs		
Milestones: Stairs		
Milestones: Mobility		
Milestone: Increased independence	Resuming prior activities	
Resumed usual/prior activities		
Resumed activities with partner		
Gradual return to activities		
Challenge with activity		
Resuming MOI activity: challenges		
Resuming MOI activity: Ongoing		
Physical activities		
Social activities		
Perspective of resuming activities		
Modification to activities		
Fatigue & pacing activity		
Did not resume prior activity: Physical Limitation		

## APPENDIX X – Qualitative Findings: Dimensions, Categories, and Class Example

Did not resume prior activity: Decided not to		Enduring functional impact of injury
Started new activity		
Change in habits/routine		
No changes in routine		
Current challenges with mobility		
Current challenges with ADLs		
Paying for household services		
Ongoing functional limitations		
No ongoing limitations		
Currently managing ADLs/mobility		
Ongoing functional issues from non-related conditions		

**APPENDIX Y – NoS MTN Service Timeline Following Covid 19**Current MTC Follow Up:

- Follow up call from MT coordinator – 2 weeks after leaving hospital
- MDT follow up clinic - 3 months
- Psychology follow up – offered in hospital and opt-in letters

Year	Dates	Events
2020	April 2020	Rehab Plan Database started Community therapy (including PT/OT) more or less stopped
	April - Dec 2020	MTC ward closed/ TC redeployed Therapy and psych continued throughout Hospital visits - Essential/limited visiting only
2021	Summer 2021	Community rehab (PT/OT) remobilized with virtual options (NearMe, some F2F) Hospital visits - Essential/limited visiting only
		Follow up call from trauma coordinator (Alison reached out to some from earlier in the year, several month delay) Hospital visits - Essential/limited visiting only
	Sept 2021	Vocational Rehab service restarted (previous VR person redeployed) Hospital visits – 2 visitors/patient/day
	Oct 2021	MDT Follow up Clinic - 3 months post-hospital discharge (for ppl D/C from hospital after - <b>July 2021</b> )
	Dec 2021	(end of recruitment for this study)
2022	May 2022	Hospital visits - Return of regular visiting rules