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INTEGRATIVE REVIEW OPEN ACCESS

The Transition of Care Between Emergency Department and Primary Care: An Integrative Systematic Review

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ABSTRACT

Aims: To identify the barriers and enablers of effective transitions of care between the emergency department and primary care providers.

Background: Successful patient care transitions from the emergency department to primary care providers are important because this process has implications for the quality, patient safety, and cost of patient care. Failure in follow-up consultations with primary care can result in representations to the emergency department, which can impact negative emergency department operational issues throughout the entire hospital.

Design and Methods: An integrative systematic review was reported according to PRISMA guidelines. The reviewers followed a systematic review protocol registered with PROSPERO (CRD42022316165). A search strategy was applied to extract articles from included databases: CINAHL, MEDLINE, PsycINFO, Scopus, ProQuest Nursing and Allied Health databases. Articles were assessed using a predetermined eligibility criterion. Quality assessment and a narrative synthesis were conducted.

Results: Of the 1200 articles screened, 25 studies were included. Four additional articles were identified from reference lists. The range of study designs included: four qualitative, three mixed methods and 22 quantitative studies. A total of 291,012 patients were represented. Successful care transition was enhanced by access to insurance, ease of payment methods, effective communication, prior booked primary care provider appointments and access to transportation. Many patients experienced financial toxicity, and the shortfall between fees charged and rebates provided was found to influence primary care provider follow-up compliance.

Conclusion: Future recommendations to provide safe and effective transitions of care would be to optimise supported self-management for patients and deliver timely and clear communication with standardised discharge documentation to be shared between the emergency department and primary care providers.

Relevance for Clinical Practice: There is no one-size-fits-all approach to delivering safe care transitions between emergency department and primary care providers, and future research should target high-risk groups.

Trial Registration: Prospero: CRD42022316165

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Summary

- Successful patient care transitions from the ED to PC providers are important because this process has implications for the quality, safety, and cost of patient care.
- The follow-up rates between ED and PC providers varied considerably due to various barriers (financial toxicity, patient perceptions of clinical need, low acuity patients, minority groups, and no prior use of PC providers, or no regular GP) and enablers (health insurance, having a PC provider, remuneration methods, effective communication, higher-income, and access to transportation).
- Future targeted care transition interventions are needed to address identified barriers to create optimised efficiencies in the healthcare system.

1 | Introduction

Successful patient care transitions from the emergency department (ED) to primary care (PC) are important because this process has implications for the quality, patient safety, and cost of patient care (Carmel et al. 2017; Huang et al. 2019; Lin et al. 2020). The timely transition of care from the ED setting to the PC provider is centrally important in addressing the increased vulnerability of patients to adverse events within the transition timeframe (Huang et al. 2019; Rider et al. 2018). Timely follow-up with PC improves disease prevention, monitoring and supported self-management of acute and long-term conditions (Schrader et al. 2019) and can provide support and ongoing clinical management of conditions that were addressed during ED visits (Carmel et al. 2017). Failure of safe and effective care transitions may be related to a lack of patient understanding of the discharge instructions, reduced adherence to prescribed medications, poor self-management of specific conditions, 8 and a lack of adherence to care plans (Lin et al. 2020). Additionally, early PC provider follow-up can assist patients in medication adherence, provide education and address any difficulties with navigating the healthcare system (Huang et al. 2019; Schrader et al. 2019).

Patients who do not follow-up with PC providers may re-present to ED for further assessment and treatment of the same recurring problem with an increased risk of hospitalisation (Croake et al. 2017; Lin et al. 2020; Luciani-McGillivray, Cushing, and Lee 2020; Magidson et al. 2020). Failure in follow-up consultations with primary care can result in representations to ED which impact negative ED operational issues such as overcrowding and crippling constraints on clinical services throughout the entire hospital (Luciani-McGillivray, Cushing, and Lee 2020; Morley et al. 2018).

Rising healthcare expenditure is a challenge and concern globally. Healthcare organisations are continuously exploring new models of care and opportunities to reduce or contain costs without sacrificing the quality of healthcare. Therefore,

understanding the transition of care between ED and PC is important for optimising patient care and the delivery of cost-effective services. Reducing unnecessary hospital admissions and ED re-presentations has the potential for cost-savings while simultaneously avoiding the cost of hospital-acquired complications such as delirium, infections, pressure ulcers, pneumonia, and urinary tract infection (Australian Commission of Safety and Quality in Health Care 2018; Independent Hospital Pricing Authority 2021). Some patients with long-term conditions may be discharged home from the ED instead of being admitted to the hospital if follow-up care can be guaranteed (Atzema et al. 2018; Carmel et al. 2017).

Several systematic reviews have explored the transition of care from ED to PC (Aghajafari et al. 2020; Glick et al. 2017; Katz et al. 2012; Lowthian et al. 2015; Schatz, Rachelefsky, and Krishnan 2009; van Loon-van Gaalen et al. 2021). Firstly, most of the existing systematic reviews on the topic are more than 5 years old and therefore, may not be relevant to current practices (Glick et al. 2017; Katz et al. 2012; Lowthian et al. 2015; Schatz et al. 2009). Secondly, there were shortcomings in some of the previous systematic reviews, such as selection bias (Katz et al. 2012), and half of the studies by Glick et al. (2017) had a weak overall quality rating. Thirdly, the scope of some of the reviews was restricted by the study population to either children or adults discharged from the ED, which means nuanced differences in care transitions across the age span are unknown (Aghajafari et al. 2020; Glick et al. 2017; Lowthian et al. 2015). Finally, no systematic reviews to date have examined newer models of care, for example, initiatives such as 'health care homes' for long-term complex conditions and the introduction of, and ongoing support delivered by telehealth (Australian Government 2021).

There has been considerable research in relation to the transition of care from hospital to PC providers (Barr et al. 2021; Hesselink et al. 2012; Huang et al. 2019; Thygesen et al. 2015), but very little research on transitions from ED to PC and so this area is not well known. Furthermore, to the best of our knowledge, the evidence is yet to be pooled and critically synthesised to understand the barriers and facilitators to successful care transitions. Understanding contemporary evidence in relation to the transition of care for patients discharged from the ED to PC providers is timely because government bodies are faced with the increasing number of patients presenting to the ED and are looking for solutions (Australian Institute of Health and Welfare 2021). Therefore, this integrative systematic review aimed to identify the barriers and enablers of effective transition of care between ED and PC providers.

2 | Methods

2.1 | Study Design

An integrative systematic review was reported according to preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines (Moher et al. 2009)—see Appendix S1. A systematic review protocol was registered with Prospero (CRD42022316165).

2.2 | Search Strategy and Study Selection

A list of preliminary search terms was generated and combined with Medical Subject Heading (MeSH) terms to generate key search terms in consultation with a research librarian. Electronic databases CINAHL, MEDLINE, PsycINFO, Scopus, ProQuest Nursing and Allied Health databases were searched and further supplemented by hand searching the reference lists of the final included studies; see Appendix S2 for search strategy. Publications were managed using Endnote X20.4 and then imported to Covidence Systematic Review Software (Veritas Health Innovation, Melbourne, Australia) where the duplicate records were removed (Bramer et al. 2016).

2.3 | Study Screening and Selection

All the titles and abstracts were screened against preselected eligibility criteria independently by three reviewers. Any disagreements were resolved by discussion (Centre of Reviews and Dissemination 2008; Lefebvre et al. 2021). Full-text articles were subsequently reviewed independently by two reviewers, and any disagreements were resolved by discussion by all reviewers. Multiple records of the same study were noted in the review process. Reasons for the exclusion of full-text studies were documented.

2.4 | Eligibility Criteria

Inclusion criteria:

- Studies published in the English language until 19 March 2022.
- Peer-reviewed publications.
- All quantitative, qualitative and mixed-methods studies irrespective of research design.
- All adults and children discharged from the emergency department.
- Context related to barriers and facilitators on the transition of care from ED to PC providers.

Exclusion criteria:

- All editorials, discussions, research protocols, published abstracts and systematic reviews.
- Patients transferred from ED to another health or care facility, such as aged care home or another hospital ward.
- Related to discharge from hospital ward (not ED) to PC providers.
- Studies focused on follow-up to ambulatory care clinics, outpatient clinics, urgent care clinics, speciality clinics and specialist doctors.
- Related to barriers and facilitators of effective hospital follow-up following a care episode in ED.
- Studies that focused on the transfer of care in the opposite direction (e.g., PC to ED).

2.5 | Data Extraction and Management

One researcher conducted data extraction and was quality checked by a second reviewer. The data extraction table was piloted on a small number of studies first, refined by consensus among all reviewers and then completed for all included studies. The extracted data included: authors, year, country, clinical setting, institution, study design, study aim, participants, age, diagnostic group, study period, study limitations and enablers and barriers of transitions of care from ED to PC providers.

2.6 | Risk of Bias Assessment of Included Studies

All included studies underwent a methodological quality assessment using the Mixed Methods Appraisal Tool (MMAT) Version 2018 (Hong et al. 2018). The MMAT (Pluye et al. 2011) has separate subsets of question items which enabled a plethora of study designs to be appraised including qualitative methods, quantitative and mixed-methods studies (Hong et al. 2018). There are seven questions for each category of study design and scored as 'Yes' (green), 'Unclear' (yellow) or 'No' (red). No study was excluded based on individual methodological quality appraisal scores to enable an understanding of the current state of the evidence base. One reviewer completed the appraisal process and was checked by a second reviewer until consensus was reached.

2.7 | Data Synthesis

The data synthesis followed the integrative review methodology proposed by Whittemore and Knafl (2005). The narrative synthesis involved the following sequential steps; data reduction which was a subgroup classification based on the levels of evidence and the review question, narrative data comparison which was an iterative process of making comparisons and identifying relationships and finally, drawing conclusions and verifications which was a synthesis of subgroup analysis to enable a comprehensive understanding of the topic, verified with primary source data for accuracy.

3 | Results

3.1 | Characteristics of Included Studies

Of the 1200 articles screened, 56 were assessed in full text and 25 studies were included (see Figure 1). Four additional articles were identified from reference lists. There was a range of study designs which included: four qualitative, three mixed-methods and 22 quantitative studies (see Table 1). The quantitative studies consisted of five randomised control trials; four quantitative descriptive studies and 13 quantitative nonrandomised studies. There were varying levels of methodological quality across the studies (see Table 2).

Outcomes assessors were blinded to intervention and exposure status, and study participants were blinded to the

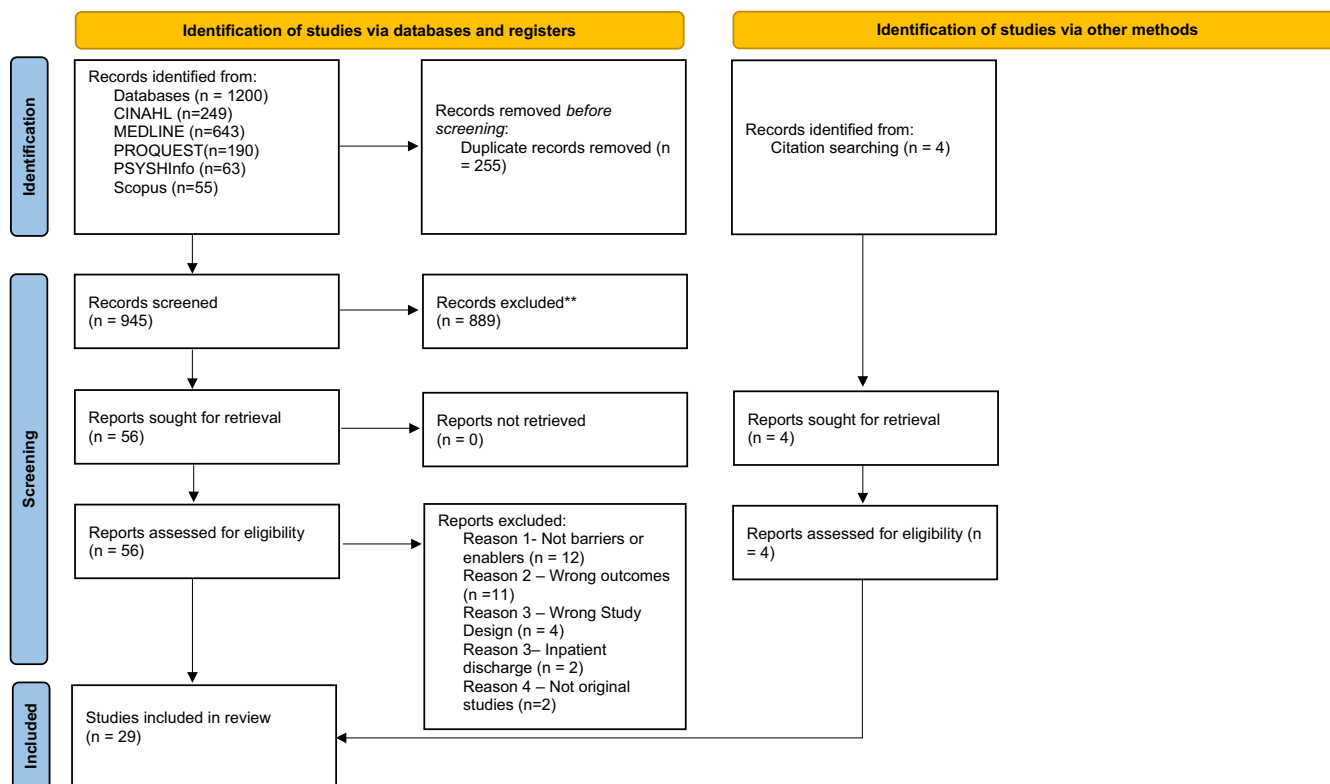


FIGURE 1 | PRISMA diagram.

research question in only one of the five RCT studies. Many studies used convenience sampling to obtain the population sample (Atzema et al. 2015, 2018; Broadwater-Hollifield et al. 2015; DeRemer et al. 2021; Hanna et al. 2020; Hastings et al. 2012; Nielsen et al. 2019; Qureshi et al. 2012; Rider et al. 2018; Schenhals, Haidet, and Kass 2019; Watson et al. 2017; Williams et al. 2013; Winders et al. 2018). Many studies relied on patient-reported follow-up rates outcomes and thus may be subject to social desirability and recall bias (Broadwater-Hollifield et al. 2015; DeRemer et al. 2021; Ferayorni et al. 2011; Hanna et al. 2020; Qureshi et al. 2012; Merritt et al. 2020; Smith et al. 2004; Wang et al. 2003; Watson et al. 2017; Williams et al. 2013). Few studies were able to verify follow-up rates using computer systems (Atzema et al. 2015; Atzema et al. 2018; Grimholt et al. 2015). Population bias may have occurred in some studies, where patients with single presenting symptoms may not be representative of the patient population presenting with a variety of other problems. Selection bias may be problematic in some studies as it was necessary to approach many people to identify patients willing and able to participate in the various studies.

The studies had global representation of care transitions from ED to primary care, including 22 studies in North America, three in Australia (Hanna et al. 2020; Qureshi et al. 2012; Watson et al. 2017) and one in Brazil (Day, Witt, and Oelke 2016), Denmark (Nielsen et al. 2019), Israel (Vinker et al. 2004) and Norway (Grimholt et al. 2015). Among the North American studies, three studies were conducted in Canada (Afilalo et al. 2007; Atzema et al. 2015, 2018) and the remaining 19 studies were from the United States (Baren et al. 2006; Blanchard et al. 2008; Broadwater-Hollifield

et al. 2015; Chou et al. 2018; DeRemer et al. 2021; Ferayorni, Sinha, and McDonald 2011; Foster et al. 2018; Hastings et al. 2012; Hunchak et al. 2015; Merritt et al. 2020; Nielsen et al. 2019; Rider et al. 2018; Schenhals, Haidet, and Kass 2019; Schrader et al. 2019; Sharp et al. 2015; Smith et al. 2004; Straus, Orr, and Charney 1983; Wang et al. 2003; Williams et al. 2013; Winders et al. 2018).

Nineteen studies were conducted at single centres (Afilalo et al. 2007; Baren et al. 2006; Broadwater-Hollifield et al. 2015; DeRemer et al. 2021; Ferayorni et al. 2011; Foster et al. 2018; Hanna et al. 2020; Merritt et al. 2020; Nielsen et al. 2019; Qureshi et al. 2012; Schenhals, Haidet, and Kass 2019; Schrader et al. 2019; Sharp et al. 2015; Smith et al. 2004; Straus, Orr, and Charney 1983; Wang et al. 2003; Watson et al. 2017; Williams et al. 2013; Winders et al. 2018). Ten studies included multiple sites (Atzema et al. 2015, 2018; Blanchard et al. 2008; Chou et al. 2018; Day, Witt, and Oelke 2016; Grimholt et al. 2015; Hastings et al. 2012; Hunchak et al. 2015; Rider et al. 2018; Vinker et al. 2004).

All included studies except two (Atzema et al. 2015, 2018) were conducted in urban hospitals (Afilalo et al. 2007; Baren et al. 2006; Blanchard et al. 2008; Chou et al. 2018; Broadwater-Hollifield et al. 2015; Day, Witt, and Oelke 2016; DeRemer et al. 2021; Ferayorni et al. 2011; Foster et al. 2018; Grimholt et al. 2015; Hanna et al. 2020; Hastings et al. 2012; Hunchak et al. 2015; Merritt et al. 2020; Nielsen et al. 2019; Qureshi et al. 2012; Rider et al. 2018; Schenhals, Haidet, and Kass 2019; Schrader et al. 2019; Sharp et al. 2015; Smith et al. 2004; Straus, Orr, and Charney 1983; Vinker et al. 2004; Wang et al. 2003; Watson et al. 2017; Winders et al. 2018;

TABLE 1 | Overview of included studies.

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Afilalo et al. 2007 Canada	Urban university teaching hospital. Annual number of ED presentations: 60,000	Quantitative interventional—4-period cross-over cluster RCT. Intervention group: FPs received reports via web-based standardised communication system. Control group: received mailed copies of ED notes.	Evaluate a web-based, standardised communication system on the continuity of care between EDs and FPs.	<i>n</i> = 23 FP practices <i>n</i> = 2022 ED visits (1048 intervention, 974 control)—representing 1616 patients. Inclusion criteria: Age: not reported Diagnosis: not reported Time period: not reported ED visit Each FP had a minimum of 100 patient visits annually to the hospital ED. Exclusion criteria: not reported.	Single site. The FPs affiliated with the same hospital or had a similar type of practice. Lack of power. Underestimation of impact of intervention as FPs received a mail copy of the first page of the ED note. Limited indicators of continuity of care accessed.
Atzema et al. 2015 Canada	Urban/Rural 157 nonpaediatric EDs in Ontario	Quantitative nonrandomised study Retrospective cohort study	To assess the frequency, timeliness and predictors for obtaining follow-up care following discharge from ED for patients with a new diagnosis of AF.	<i>n</i> = 14,907 patients Inclusion criteria: Age: 18years+ Diagnosis of AF Time period: 1.4.2007 and 31.3.2012 Exclusion criteria: Patients who died in the ED, patients who were admitted to hospital, speciality ED departments (i.e., only paediatric or mental health) and those that were not open 24 h day, patients who were given a lower acuity score (CTAS score of 4 or 5) and patients with hx of AF or flutter as defined as an ED visit, hospitalisation or outpatient visit for AF or flutter in the 5 years before the index date.	Delay in capturing patients who change physicians. Bias as potential to underbill in capitation-based practices. Included all follow-up visits regardless of ICD code.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Atzema et al. 2018 Canada	Urban/Rural 157 nonpaediatric ED	Quantitative nonrandomised study. Retrospective cohort study.	To examine the frequency of follow-up care after an ED visit for a new diagnosis of AF, HF or HTN, and whether such follow-up was associated with the patient, EP and FP, and the healthcare system characteristics, including FP's remuneration method.	<i>n</i> = 41,485 ED visits Inclusion Criteria: Age: 18years+ Diagnosis: New AF, HTN, HF Time period: 1.4.2007 to 31.3.2014 Valid Ontario Health Care Number. Exclusion criteria: Repeat visits, patients with low ED acuity triage score, those admitted to hospital, died in the ED, speciality EDs and those not open 24 h daily. Excluded patients with an ED diagnosis for each disease if hx of that disease defined as an ED visit, hospitalisation or outpatient visit for that disease in the 5 years prior to the index date.	Time delay in capturing patients who change doctors, bias potential under billing in capitation-based practices, excluded visits to other medical providers.
Baren et al. 2006 USA	Urban University teaching hospital Annual number of ED presentations: 47,000	RCT. Intervention group: received free 5-day course of prednisone, vouchers for transportation to and from their PCP and a 48-h telephone reminder to make an appointment with their PCP. Control group: usual care. Intervention: free 5-day course of prednisone, transport vouchers, reminder to make an appointment with PCP Multicomponent In and post-ED	Determine whether a simple ED intervention improves the likelihood of PCP follow-up	<i>n</i> = 192 patients enrolled, intervention group (<i>n</i> = 98), control group (<i>n</i> = 94). 178 (93%) completed follow-up. Inclusion criteria: Age: 16–45 years Diagnosis: asthma Time period: 5.3.1998 to 15.11.98. Exclusion criteria: Unable/unwilling to provide informed consent, non-English speaking, previously enrolled in the study or admitted for inpatient care.	Patient enrolment not consecutive, unknown effect of missed patients, patients not blinded to intervention, generalisability, unable to determine how taxicab vouchers were spent, unable to determine whether relapse occurred at institution outside local healthcare system.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Blanchard et al. 2008 USA	Urban Not hospital based	Quantitative Descriptive Study. Observational—survey.	To evaluate accessibility of outpatient follow-up based on insurance status.	<i>n</i> = 250 phone calls to 163 clinics Inclusion criteria: Age: 40-year-old Diagnosis: HTN Time period: not reported Hypothetical patient presenting with a scripted presentation Exclusion criteria: not reported	Evaluated access to care for English-speaking patients seeking primary care in the city. Language barriers might lead to further delays in appointment access. Sought appointments only within the primary care system. Speciality care may be even more difficult to obtain, particularly for those without private insurance. May not be generalisable to a larger population.
Broadwater-Hollifield et al. 2015 USA	Urban University teaching centre. Annual number of ED presentations: 40,000	Quantitative, Nonrandomised Study. Prospective, observational study.	To determine predictors of adherence to medical recommendations after an ED visit with particular emphasis on factors related to cost of care in evaluating these potential predictors.	<i>n</i> = 442 patients Inclusion criteria: Age: 18years+ Diagnosis: not reported Time period: 1.1.2013 to 31.8.2013. English speaking deemed psychologically and medically stable by the ED care provider. Exclusion criteria: prisoners, brought in by emergency medical services transportation due to possible severity of illness, or incapacitated by medical illness.	Single centre—generalisability. Self-reported, included only English-speaking individuals. Potential selection biases.
Chou et al. 2018 USA	Urban Primary care practices	Quantitative Descriptive Study. Audit.	To examine the association between availability of timely PC follow-up appointments and practice services intended to improve access, including evening or weekend appointments as well as PCMH model.	<i>n</i> = 49 practices 536 phone calls Inclusion criteria: all primary care practices in the cities of New Haven, East Haven, West Haven, North Haven and Hamden, in the state of Connecticut. Age: not reported Diagnosis: lower back pain, HTN Time period: 1.10.2015 to 31.5.2016. Exclusion criteria: Practices serving special populations	Single mid-sized city—limited generalisability Limited to PCMH designation so may have neglected practices that have implemented similar elements but did not seek form designation. Assessed availability of follow-up appointments for a uniquely vulnerable patient group discharged from the ED without established PC.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Day, Witt, and Oelke 2016 Brazil	Urban	Qualitative Study. Descriptive exploratory research	To evaluate communication between ED and PHC services from the health professionals' review.	<i>n</i> = 14, including interns of health disciplines, advisors of interns, nurses and physicians from the ED and PHC Family unit. Seven from the ED and PHC services. Inclusion criteria: Age: not reported Diagnosis: not reported Time period: not reported Health professionals working at university hospital's ED and municipal primary health centres. Exclusion criteria: not reported	Single site—one hospital and one PHC, implementation of the policy and implementation were not completed so generalisability may be limited.
DeRemer et al. 2021 USA	Rural University teaching hospital Annual number of ED presentations: not reported	Quantitative Study Nonrandomised Study. Retrospective.	To describe a novel pilot process for transitional care management from the emergency department utilising pharmacy student extenders to overcome resource limitation at a rural family medicine clinic and establish follow-up primary physician contact.	<i>n</i> = 38 patients Inclusion criteria: Age: not reported Diagnosis: not reported Time period: over 4 weeks Active clinic patients who sought acute-level care at ED or urgent centres with the University of Florida Health System, not admitted to hospital. Exclusion criteria: patients with mental health-related acute presentation, and patients with appointments were contacted only to confirm the follow-up.	Small patient population Generalisability limited Single centre
Ferayorni et al. 2011 USA	Urban University teaching hospital Paediatric ED Annual number of ED presentations: 21,000	Quantitative Nonrandomised Study. Cross-sectional study.	To assess their access to care, unmet healthcare needs, barriers to care and follow-up care.	<i>n</i> = 385 patients Inclusion criteria: Age: Birth to 18 years Diagnosis: not reported Time: 1.10.2006 to 31.11.2006. Exclusion criteria: Children who presented with multiple traumas requiring trauma team activation, or with life-threatening medical conditions, incarcerated children, parents or guardians of children who refused to be interviewed and those who were unable to understand or fully participate in the informed consent process.	Self-reported survey, acculturation level of immigrant families not determined, seasonality of ED visit was not accounted for, single time period. Legal status of foreign-born children not known and did not collect any demographic information on those unwilling to participate in the study.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Foster et al. 2018 USA	Urban University teaching hospital Annual number of ED presentations: 80,000	Quantitative Nonrandomised Study. Retrospective cohort study	To evaluate the effectiveness of inclusive, ED-based care coordination intervention in achieving linkage to primary care.	<i>n</i> = 2142 referrals for 2064 patients to care coordination specialists. Inclusion criteria: Aged: over 18 years Diagnosis: not reported Time period: 1.1.2010 to 31.12.2010. Exclusion criteria: those under the age of 18, those identified as prisoners and patients who cited 'legal troubles' as a barrier to primary care access.	Single-centre study so generalisability is questionable.
Grimholt et al. 2015 Norway	Five EDs and general practices	RCT. Intervention group: scheduled appointment with GP within 1 week of ED discharge, and at least five scheduled appointments consultations over the next 6 months. GPs received guidelines with suggestions for assessing and managing patients. Control group: received usual care.	To examine whether structured follow-up by GPs increased the content of, adherence to and satisfaction with treatment after discharge from emergency departments.	<i>n</i> = 202 patients, 101 to intervention and 101 to control group. Inclusion criteria: Ages: 18–75, Diagnosis: deliberate self-poisoning Time period: Not reported Registered with a GP and discharged directly to home, thus enabling follow-up by a GP. Exclusion criteria: Patients with present psychosis, mental retardation, organic cognitive impairment and those unable to fill in the questionnaire because it was not written in their native language.	Not known if GPs used the guideline. Dropouts and self-reporting response rates during follow-up biased the validity. Findings cannot be generalised. GPs in the control group were not blinded. Factors influencing outcomes are not described.
Hanna et al. 2020 Australia	Urban Suburban Hospital Annual number of ED presentations: 36,000	Qualitative Descriptive Study	To understand how women aged 65 years+ sought GP follow-up after discharge from the ED.	<i>n</i> = 100 Inclusion criteria: Age: 65 years and older Diagnosis: not reported Time: 1.5.2018 to 0.6.2018; Female; admitted to the ED with ATS of 3, 4 or 5, discharged from the ED directly back into the community and receiving an explicit GP follow-up instruction in the discharge summary. Exclusion criteria: not reported	Family members acted as interpreters where language difficulties were encountered—source of bias. Relationship sensitives may be underemphasised in data and analysis. Some participants may have been more guarded in responses to male interviewer. Used field notes to capture data.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Hastings et al. 2012 USA	Veteran Affairs Medical Centre ED, Annual numbers of ED presentations: not reported	Quantitative Descriptive Study Survey.	To assess older veterans' understanding of their ED discharge information and patient assessment of overall quality of care.	<p><i>n</i> = 305 veterans. Inclusion criteria: Age: 65+ Diagnosis: not reported Time: 25.10.2008 to 7.3.2010. Exclusion criteria: Had no visits (other than ED) to the study facility in the previous 12 months; were seen for nurse visit or medication refills only; were discharged to a location other than home (because discharge information may have been given directly to personnel at the accepting facility, instead of the patient or their family); left before the visit was completed; or did not have a valid telephone number.</p>	Recall bias. Single-centre study. Perceived understanding
Hunchak et al. 2015 Canada	Urban Annual ED presentations: not reported	Mixed-Methods Study	The purpose of this study was to develop and pilot the novel system, solicit physician feedback on usability and compare family physician awareness of patients' ED visits pre- and postsystem implementation	<p><i>n</i> = 9 FP Prepilot chart audit of 300 charts from 10 FP offices. Data collected for 1-year postintroduction of web portal. After 235 patient ED visits, users completed standardised written survey and focus groups with 10 structured questions. Inclusion criteria: Age: not reported Diagnosis: not reported Time period: not reported Exclusion criteria: not reported</p>	Limited data points for each phase of this study may not reflect the experience, perceptions or opinions of a broader community of family physicians. The information available for electronic transfer is limited by hospital-based EMR systems and may vary between hospitals.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Merritt et al. 2020 USA	Urban, University teaching hospital Annual number of ED presentations 71,000 annual ED	Quantitative, RCT intervention groups: a PC appointment booked through the booking website prior to ED discharge, written information on how to use the booking website Control group: usual care (i.e., standard follow-up instructions).	To determine whether using a freely available physician appointment booking website resulted in higher self-reported PC follow-up.	n = 272 enrolled subjects Inclusion criteria: Age: 18 years+ Diagnosis: not reported Time: 5.11.2015 to 26.6.2017 Discharged from the ED, private or public health insurance, spoke English, had email address, reported that they did not have a PC provider or reported that they had one but wanted new uninsured, no PC provider (or wanted a new PC provider) and the ED provider considered PC follow-up within 14 days as important. Exclusion criteria: patients who did not want a PC provider; (2) did not want to schedule a PC follow-up visit; (3) no email access; (4) prisoner; (5) psychiatric chief complaint; or (6) had Kaiser health insurance since Kaiser was not listed on the booking website used in this study.	Self-reported—social desirability and recall bias, unable to confirm if bookings were kept, do not know the extent patients tried to make appointments, telephone follow-up rate modest, negatively impacted on power to detect significant differences among the study groups, generalisability, used only English-speaking patients, not known if bookings are problematic in rural settings.
Nielsen et al. 2019 Denmark	Urban University teaching hospital Annual number of ED presentations: not reported	Qualitative Study	To explore elderly patients' experiences of being discharged and returning to everyday lives after discharge from a short-stay unit at the Emergency Department.	n = 11 patient interviews, patients were in intervention group daily activities were assessed, referred for further rehabilitation in primary care and a follow-up home visit the day after discharge. Inclusion criteria: Age: over 65+, Diagnosis: not reported Time period: Discharged directly to their own home from a short-stay unit at the ED, living in a larger municipality in Denmark. Exclusion criteria: terminal illness, severe dementia or being unable to speak and understand Danish.	Single site, convenience sampling, so results are not transferrable to all elderly patients.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Qureshi et al. 2012 Australia	Urban Tertiary referral hospital Annual number of ED presentations: 60,000	Quantitative nonrandomised study. Observational— Prospective cohort study.	To identify factors associated with failure to follow up with a GP after discharge from the ED or EMU.	<i>n</i> = 217 patients. Inclusion criteria: Age: 18 years+ Diagnosis: not reported Time: 29.6.2011 to 31.12.2011 Treating doctor required them to follow up with a GP for ongoing medical care. Exclusion criteria: nursing home patients, and patients with intellectual disability who would be unable to understand, consent and comply with instructions from ED.	Single institution. Small proportion of patients discharged from the ED were enrolled in the study. Generalisability.
Rider et al. 2018 USA	Academic and community physicians at eight different sites across USA.	Mixed-method study prospective study using semi-structured interviews.	Aimed to characterise the current practices in the transition of care from the ED to the outpatient setting. Sought to clarify providers' preferences and use of EMR technology in managing that transition.	<i>n</i> = 49 PCPs and 52 EPs, 102 interviews Inclusion criteria: Age: Fill this in you need to keep consistent. Diagnosis: Time period: 11.11.2014 and 28.2.2015. Exclusion criteria: not stated	Convenience sample lacks representation from the community sites without academic affiliation. Lacks input from mid-level providers and residents, reporting bias on the part of the participant. Recall bias.
Schenhals, Haidet, and Kass 2019 USA	Suburban/Rural Teaching Hospital Annual ED visits: not reported	Qualitative study	Understand patients' perspective about system-based barriers that may influence decision-making regarding following discharge instructions.	<i>n</i> = 22 patients Inclusion criteria: Age: 18 years+ Diagnosis: abdomen related Time: 1.5.2015 to 30.9.2016. Exclusion criteria: pregnancy, residence in a nursing home or other extended care facility, inability to consent, inability to speak English, incarceration or previously having been included in the study.	Population bias, single site, may not be representative of a larger patient population presenting with a variety of other complaints. Selection bias.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Schrader et al. 2019 USA	Urban Tertiary referral centre Annual number of ED presentations: 120,000.	Quantitative nonrandomised study. Retrospective observational study.	To determine if providing health insurance coverage, assigning a dedicated PCP and arranging timely post-ED clinic can improve compliance with clinic visits and reduce ED discharge failures.	<i>n</i> = 227,627 patients Inclusion criteria: all patients discharged from the ED Ages: Lifespan Diagnosis: not reported Time period: 1.1.2015 to 31.12.2017 Exclusion criteria: patients who were admitted, expired, transferred to other facilities, left without being seen, eloped or left against medical advice, prisoners.	Single-centre, retrospective data analysis studies in general, limited and potentially incorrect information and missing data, potential patient population selection bias, differentiating ED discharge failures into restricted and broad/uncertain might not be accurate as not able to accurately differentiate between patients with certain uncertainties. Unable to know the percentage of patients who had appointments in other hospitals or followed up at PCP clinics outside of the study hospital system. Unable to know the success rate of these phone calls being answered. Some individual patients might have logged multiple ED encounters.
Sharp et al. 2015 USA	Suburban teaching hospital. Number of ED presentations: 80,000 annual ED presentations.	Mixed-method study Group 1: receive the usual care discharge instructions only. Group 2: receive a reminder email message the day after the ED visit. Patients then completed a telephone survey 2 weeks after their ED visits.	Hypothesised that email reminders containing follow-up instructions to patients discharged from the ED would improve the timeliness and overall follow-up rates of patients with their PCPs.	<i>n</i> = 577 patients. Control group 295 patients, intervention group 282 patients. Inclusion criteria: Age: 18years+ Diagnosis: not reported Time period: 25.9.2012 and 28.2.2013 Have PCP in the Integrated Health Associates group, have an ESI of 2, 3 or 4, report English as primary language and report holding at least one email account. Exclusion criteria: in prison or institutionalised, under temporary or permanent custodianship, or presented with mental health-related chief complaint.	Study stopped early due to slower than expected enrolment. Diminished effect of follow-up reminder emails as PCP group already had a system in place to notify providers when their patients are seen in the ED. Only able to reach 57% of enrolled patients for the phone survey. Limited generalisability.

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Smith et al. 2004 USA	Urban Paediatric ED Annual presentations: not reported	Quantitative— Interventional RCT Intervention group: combination of telephone coaching and monetary incentive. Control group: no intervention.	To determine the combination of telephone coaching and a monetary incentive to increase the proportion of urban poor children who obtain follow-ups with their PCPs after emergency department visits for acute asthma	N = 527 children, control group n = 264, and intervention group n = 263 Inclusion criteria: Age: 2 to 12 years of age, Diagnosis: asthma Time period: 1.2.1999 and 31.5.2001. No medical insurance Exclusion criteria: admission to hospital at the time of the ED visit, chronic illness other than asthma, no working telephone at home, participation of this child or another child in the same household in this or another asthma study, no primary care provider and inability to communicate effectively in English.	Only able to apply the coaching intervention to 84.7% and 81.8% of parents for the 2- and 5-day telephone calls, respectively. Only able to categorise visits based on what was documented in the chart. Single site.
Straus, Orr, and Charney 1983 USA	Urban-suburban. Annual number of ED presentations: 60,000	Quantitative nonrandomised study	To determine what proportion of unaffiliated patients are successfully referred from an emergency room to primary care provider.	Two cohorts: a concurrent cohort consisting of 398 patients enrolled prospectively from 1.10.79 to 31.12.1979, and a nonconcurrent cohort of 500 patients enrolled by reviewing all emergency room records. Inclusion criteria: Age not reported Diagnosis: not reported Time period: 1.11.77 to 31.12.1978, received care in the medical or paediatric nonurgent area of the ED, identified no regular primary care physician, resided in the Sinai Hospital catchment area and not admitted to the hospital for their presenting problem. Exclusion criteria: not reported	Single centre and limits generalisability

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Vinker et al. 2004 Israel	Urban District medical centre care clinics and 12 primary care clinics (32 family practitioners)	Quantitative study nonrandomised study. Retrospective study.	To evaluate the continuity of care after ED visits.	<i>n</i> = 359 discharges Inclusion criteria: Age: 18 years+, Diagnosis: not reported Time: over 1 month Visit to the general ED, discharged to the community (not hospitalised) at that visit, living and getting medical care in a family medicine group practice in the Rehovot Region. Exclusion criteria: Visits due to accidents, trauma, surgery, orthopaedics, ENT, ophthalmology and other specialities were excluded from the study.	Unique healthcare system, results may not automatically be generalised to other healthcare systems. Only describes the written communication between ED and PC.
Wang et al. 2003 USA	Urban University Teaching Hospital ED Annual ED presentations: 38,000.	Quantitative descriptive study. Prospective observational study.	To identify demographic, socioeconomic and clinical predictors of aftercare noncompliance by paediatric ED patients.	<i>n</i> = 409 children Inclusion criteria: Age: 0–18 years Diagnosis: not reported Time: 1.7.2002–31.8.2002. Exclusion criteria: admitted to hospital or if their guardians were unavailable or unwilling to consent during the ED visit.	Potential sampling bias. Results may be applicable to populations with lower educational levels. System issues may have influenced results. Recall bias. Hawthorne effect. Single site.
Watson et al. 2017 Australia	Suburban ED. Annual number of ED presentations: not reported	Quantitative descriptive study. Prospective, descriptive study.	To measure the proportion of patients aged 65 years+, discharged from a suburban ED between a 2 weeks	<i>n</i> = 50 patients Inclusion criteria: Age: 65 years+ Diagnosis: not reported Time: 2-week period in July 2016. Admitted to the ED during the recruitment weeks, subsequently discharged directly back into the community and sent with a discharge summary. Exclusion criteria: admitted as inpatients or transferred to another public health facility prior to discharge.	Single location. Language difficulties. Some questions were subjective, introducing bias. Small study number and low statistical power

(Continues)

TABLE 1 | (Continued)

Study, year, country	Clinical setting	Study design	Aim	Participants	Limitations
Winders et al. 2018 USA	Urban, Academic ED Annual ED presentations: 70,000	Quantitative nonrandomised studies. Observational study.	To describe patient beliefs, education and sociodemographic factors as they relate to outpatient follow-up.	<i>n</i> = 90 patients. Inclusion criteria: Aged: 18 years+ Diagnosis: HTN Time period: 1.4.2014 and 31.6.2014 ESI triage acuity of 3, 4 or 5, order to be discharged home from the ED and had at least one phone number available in the medical records. Exclusion criteria: unable to provide informed consent or if they were unable to be contacted within the two to four weeks after their eligible ED visit.	Small sample size Limited generalisability
Williams et al. 2013 USA	Urban Tertiary care academic paediatric hospital Annual ED presentations: 24,000	Quantitative study. Quasi-experimental: Retrospective chart review.	To improve parental understanding of their child's asthma severity at the time of presentation to the ED.	<i>n</i> = 216 charts Inclusion criteria: Age: Children Diagnosis: asthma Time: 1.1.2011 to 31.5.2012. Exclusion criteria: patients who listed their PCP as outside of the Medical University of South Carolina Health Care System and charts that did not document initial CAS on presentation to the ED.	Unable to verify by EMR the parental reported follow-up visit. Absence of assessment of 1-month post-ED follow-up in the postintervention analysis, possibility of inaccuracy in identifying patients, preintervention and postintervention, not the same people, small sample size and short data collection time. Did not use a validated survey.

Abbreviations: ACC, after care clinic; AF, Atrial fibrillation; ATS, Australian Triage Score; CAD, Coronary Artery Disease; CAS, Clinical Asthma Score; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; CTAS, Canadian Triage Assessment Score; ED, Emergency Department; EMR, Emergency Medical Record; EMU, Emergency Physicians; ESI, Emergency Severity Index; FHN, Family Health Network; FHT, Family Health Team; FP, Family Physicians; GP, General Practitioner; HF, Heart Failure; HTN, Hypertension; hx, History; ICD, International Classification of Diseases; OR, Odds Ratio; PCMH, Patient-Centred Medical Home; PCP, Primary Care Physicians; PCP, Primary care provider; PED, Paediatric emergency department; PHC, Primary Health Care; RCT, Randomised Control Trial; RF, Renal Failure; RR, Risk Ratio; UHMC, United Hospitals' Medical Clinic.

TABLE 2 | Results of quality appraisal.

1. Qualitative study	Item number of checklist						
	S1.	S2.	1.1.	1.2.	1.3.	1.4.	1.5.
Day, Witt, and Oelke (2016)	Y	Y	Y	Y	Y	U	Y
Hanna et al. (2020)	Y	Y	Y	Y	Y	Y	Y
Nielsen et al. (2019)	Y	Y	Y	Y	Y	Y	Y
Schenhals, Haidet, and Kass (2019)	Y	Y	Y	Y	Y	Y	Y

Item number checklist key^a: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 1.1. Is the qualitative approach appropriate to answer the research question, 1.2. Are the qualitative data collection methods adequate to address the research question, 1.3. Are the findings adequately derived from the data, 1.4. Is the interpretation of results sufficiently substantiated by data, 1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?

2. Quantitative randomised controlled trials	Item number of checklist						
	S1.	S2.	2.1.	2.2.	2.3.	2.4.	2.5.
Afilalo et al. (2007)	Y	Y	U	U	Y	N	Y
Baren et al. (2006)	Y	Y	Y	Y	Y	Y	N
Grimholt et al. (2015)	Y	Y	Y	Y	Y	Y	Y
Merritt et al. (2020)	Y	Y	Y	Y	Y	N	Y
Smith et al. (2004)	Y	Y	U	Y	Y	Y	Y

Item number checklist key^a: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 2.1. Is randomisation appropriately performed, 2.2. Are the groups comparable at baseline, 2.3. Are there complete outcome data, 2.4. Are outcome assessors blinded to the intervention provided, 2.5. Did the participants adhere to the assigned intervention?

3. Quantitative nonrandomised studies	Item number of checklist						
	S1.	S2.	3.1.	3.2.	3.3.	3.4.	3.5.
Atzema et al. (2015)	Y	Y	Y	Y	Y	U	Y
Atzema et al. (2018)	Y	Y	Y	Y	Y	U	Y
Broadwater-Hollifield et al. (2015)	Y	Y	Y	Y	Y	U	Y
DeRemer et al. (2021)	Y	Y	Y	Y	Y	U	Y
Ferayorni, Sinha, and McDonald (2011)	Y	Y	Y	Y	Y	U	Y
Foster et al. (2018)	Y	Y	Y	Y	Y	U	Y
Qureshi et al. 2012	Y	Y	Y	Y	Y	U	Y
Schrader et al. (2019)	Y	Y	Y	Y	Y	U	Y
Straus, Orr, and Charney (1983)	Y	Y	Y	Y	Y	U	Y
Vinker et al. (2004)	Y	Y	Y	Y	Y	U	Y
Wang et al. (2003)	Y	Y	Y	Y	Y	U	Y
Williams et al. (2013)	Y	Y	Y	Y	Y	U	Y
Winders et al. (2018)	Y	Y	Y	Y	Y	U	Y

Item number checklist key^a: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 3.1. Are the participants representative of the target population, 3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure), 3.3. Are there complete outcome data, 3.4. Are the confounders accounted for in the design and analysis, 3.5. During the study period, is the intervention administered (or exposure occurred) as intended?

(Continues)

TABLE 2 | (Continued)

4. Quantitative descriptive studies	Item number of checklist						
	S1.	S2.	4.1.	4.2.	4.3.	4.4.	4.5.
Blanchard et al. (2008)	Y	Y	Y	U	Y	Y	Y
Chou et al. (2018)	Y	Y	Y	U	Y	U	Y
Hastings et al. (2012)	Y	Y	Y	U	Y	U	Y
Watson et al. (2017)	Y	Y	Y	U	Y	Y	Y

Item number checklist key^a: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 4.1. Is the sampling strategy relevant to address the research question, 4.2. Is the sample representative of the target population, 4.3. Are the measurements appropriate, 4.4. Is the risk of nonresponse bias low, 4.5. Is the statistical analysis appropriate to answer the research question?

5. Mixed methods	Item number of checklist						
	S1.	S2.	5.1.	5.2.	5.3.	5.4.	5.5.
Hunchak et al. (2015)	Y	Y	N	Y	Y	N	Y
Rider et al. (2018)	Y	Y	N	Y	Y	Y	N
Sharp et al. (2015)	Y	Y	N	Y	Y	N	Y

Item number checklist key^a: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 5.1. Is there an adequate rationale for using a mixed methods design to address the research question, 5.2. Are the different components of the study effectively integrated to answer the research question, 5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted, 5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed, 5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?

^aThree levels of assessment quality scores.

Yes (Y)
Unclear (U)
No (N)

Williams et al. 2013). The remaining two studies were based in the province of Ontario, Canada, and included all patients discharged from both rural and urban emergency departments (Atzema et al. 2015, 2018). No studies were identified as being solely rural based.

3.2 | Population

The sample size ranged from 7 to 227,627 patients, with a total of 291,012 patients represented in this systematic review. The clinical and demographic characteristics of the patient population varied across the studies. There was heterogeneity in population age. Ten studies included adults aged over 18 years (Atzema et al. 2015, 2018; Broadwater-Hollifield et al. 2015; Foster et al. 2018; Merritt et al. 2020; Qureshi et al. 2012; Schenhals, Haidet, and Kass 2019; Sharp et al. 2015; Vinker et al. 2004; Winders et al. 2018), one study included patients aged 10–45 years (Baren et al. 2006), four studies included adults aged 65 years and older (Hanna et al. 2020; Hastings et al. 2012; Nielsen et al. 2019; Watson et al. 2017) and one study included adults aged 18–75 years (Grimholt et al. 2015). Likewise, the age of children represented in the paediatric studies also varied significantly and ranged from birth to 18 years (Ferayorni, Sinha, and McDonald 2011), 1 to 17 years (Williams et al. 2013), 2–12 years (Smith et al. 2004) and 1 to 18 years (Wang et al. 2003). Several studies did not report the

population age range (Chou et al. 2018; DeRemer et al. 2021; Straus, Orr, and Charney 1983).

Some studies were not patient focused, instead involved healthcare professionals including emergency physicians (Day, Witt, and Oelke 2016; Rider et al. 2018), family physicians (Afilalo et al. 2007; Hunchak et al. 2015), primary care providers (Chou et al. 2018; Day, Witt, and Oelke 2016; Rider et al. 2018), multiple health disciplines (Day, Witt, and Oelke 2016), pharmacy students (DeRemer et al. 2021) and the use of hypothetical patients scenarios (Blanchard et al. 2008; Chou et al. 2018).

Most studies did not report a particular diagnosis (DeRemer et al. 2021; Ferayorni et al. 2011; Foster et al. 2018; Hanna et al. 2020; Hastings et al. 2012; Merritt et al. 2020; Nielsen et al. 2019; Qureshi et al. 2012; Straus, Orr, and Charney 1983; Vinker et al. 2004; Wang et al. 2003; Watson et al. 2017). One study included all patients discharged from emergency departments with multiple diagnoses (Schrader et al. 2019). Other studies recruited patients with specific diagnoses: hypertension (Winders et al. 2018), asthma (Baren et al. 2006; Smith et al. 2004; Williams et al. 2013), abdominal pain (Schenhals, Haidet, and Kass 2019), deliberate self-poisoning (Grimholt et al. 2015), atrial fibrillation (Atzema et al. 2015) or multiple cardiac diagnoses—hypertension, atrial fibrillation and heart failure (Atzema et al. 2015; Chou et al. 2018). Blanchard et al. (2008) used a hypothetical

patient presenting with a scripted presentation of hypertension evaluated and discharged in the ED, whereas Chou et al. (2018) used a secret shopper audit to access the availability of appointments for patients with lower back pain and hypertension. Two of the paediatric studies recruited patients with asthma (Smith et al. 2004; Williams et al. 2013).

3.3 | Study Interventions

Eleven quantitative study interventions aimed to improve general practitioner (GP) follow-up through patient education, booked appointments or improving communication between the ED and PC or between patient and ED discharge providers (Afilalo et al. 2007; Baren et al. 2006; DeRemer et al. 2021; Foster et al. 2018; Grimholt et al. 2015; Merritt et al. 2020; Schrader et al. 2019; Sharp et al. 2015; Smith et al. 2004; Straus, Orr, and Charney 1983; Williams et al. 2013). There were eight single-component interventions (Afilalo et al. 2007; DeRemer et al. 2021; Foster et al. 2018; Grimholt et al. 2015; Merritt et al. 2020; Straus, Orr, and Charney 1983; Williams et al. 2013). These included parent/patient education (Straus, Orr, and Charney 1983; Williams et al. 2013); reminders via email (Sharp et al. 2015); appointment scheduling by the provision of a clinical referral with optional scheduling assistance (Foster et al. 2018); a follow-up phone call to assist with scheduling follow-up appointments (DeRemer et al. 2021); written education whereby patients were given a brochure on the importance of GP follow-up (Straus, Orr, and Charney 1983); and PC appointment booked through the booking website or written information on how to use the booking site (Merritt et al. 2020). One study involved a care coordination specialist to facilitate and provide a GP referral (Foster et al. 2018). There were four multicomponent interventions (Baren et al. 2006; Grimholt et al. 2015; Schrader et al. 2019; Smith et al. 2004). These included parent education and monetary incentives (Smith et al. 2004); administration of drug prescriptions, transport vouchers and a 48 h reminder to follow-up with PC provider (Baren et al. 2006); and provision of health insurance and assistance with assigning a PC provider, arranging timely post-ED clinic follow with a reminder phone call (Schrader et al. 2019) and provision of structured GP follow-up and written guidelines for the GPs for motivating patients to follow treatment (Grimholt et al. 2015). Five studies involved evaluating communication systems, including web base technology (Afilalo et al. 2007; Hunchak et al. 2015; Rider et al. 2018), email (Sharp et al. 2015) and phone call (DeRemer et al. 2021).

The frequency of follow-up appointment attendance was measured in 21 studies (Afilalo et al. 2007; Atzema et al. 2015; 2018; Baren et al. 2006; Broadwater-Hollifield et al. 2015; Chou et al. 2018; DeRemer et al. 2021; Ferayorni et al. 2011; Foster et al. 2018; Hanna et al. 2020; Merritt et al. 2020; Nielsen et al. 2019; Qureshi et al. 2012; Schrader et al. 2019; Sharp et al. 2015; Smith et al. 2004; Straus, Orr, and Charney 1983; Wang et al. 2003; Watson et al. 2017; Winders et al. 2018; Williams et al. 2013). The results ranged from 31% (Vinker et al. 2004) to 89.7% (Atzema et al. 2018). Follow-up rates were monitored, and compliance improved in all but one of the interventional studies, which instead examined web-based communication systems between ED and PC providers (Afilalo

et al. 2007). In two Canadian studies, the follow-up rates improved with length of time from ED discharge, from 47% within 7 days to 78% within 30 days (Atzema et al. 2018). These results were similar to Atzema et al. 2015, where follow-up rates improved from 35.6% within 7 days to 43.4% within 30 days.

Overall, there were beneficial effects observed with various multicomponent interventions including scheduling an outpatient appointment during the ED visit (DeRemer et al. 2021; Foster et al. 2018; Merritt et al. 2020; Straus, Orr, and Charney 1983); provision of insurance (Baren et al. 2006; Schrader et al. 2019); telephone coaching and monetary incentive (Smith et al. 2004); education of parents (Williams et al. 2013); written instructions on how to use website booking (Merritt et al. 2020); and provision of monetary incentive, provision of drugs or transport vouchers (Baren et al. 2006).

4 | Results

4.1 | Enablers of Care Transitions

Health insurance was identified as an enabler for follow-up compliance in several quantitative studies (Blanchard et al. 2008; Broadwater-Hollifield et al. 2015; Ferayorni, Sinha, and McDonald 2011; Qureshi et al. 2012; Schrader et al. 2019; Wang et al. 2003), see Appendix S3. Patients with health insurance had improved follow-up rates with PC providers compared to those who did not have insurance (Qureshi et al. 2012). Privately insured patients were more likely to secure GP appointments (Blanchard et al. 2008; Chou et al. 2018). Seventy-one per cent of telephone calls for privately insured hypothetical patients resulted in a successful appointment, with Medicaid fee for service patients having a significantly lower rate of successful appointments (36.6%; $p=0.002$) (Blanchard et al. 2008). Likewise, Chou et al. (2018) found that when patients had commercial insurance, 38.8% (67/175) were able to secure an appointment within 7 days compared to Medicare calls 24.7% (45/182), ($p=0.01$). Patients who were adherent to follow-up recommendations were likely to have a PC provider or had prior experience in the PC health system (Atzema et al. 2015; Baren et al. 2006; Broadwater-Hollifield et al. 2015; Hanna et al. 2020). The remuneration method of the family physicians also affected the likelihood of follow-up. In Canada, those patients with a family physician being remunerated via primarily fee-for-service methods were more likely to be seen within 7 days than those who were reimbursed through a primarily capitated model (Atzema et al. 2015).

Efforts to improve communication between ED and PC providers included telephone communication, web-based communications and the provision of guidelines with suggestions for assessing and managing patients (Afilalo et al. 2007; Day, Witt, and Oelke 2016; Grimholt et al. 2015; Hunchak et al. 2015; Rider et al. 2018). Telephone communication between ED and PC providers benefited the patient's continuity of care by allowing for patient care planning, increased knowledge of care networks and promoted confidence in the services provided (Day, Witt, and Oelke 2016). Web-based communication between ED and PC providers improved ED-PC communication, leading to significant improvements in continuity of care and increased

awareness of ED presentations (Afilalo et al. 2007; Hunchak et al. 2015; Rider et al. 2018). Verbal telephone calls to patients post-ED visits enabled the opportunity to assist with scheduling follow-up appointments at the patient's primary physician clinic or to remind the patients to make the appointment, resulting in improved follow-up rates (Baren et al. 2006; DeRemer et al. 2021). Patients who received email reminders to follow-up with their PC provider demonstrated a high interest in receiving further emails (Sharp et al. 2015). One qualitative study reviewed communications between ED and PC providers, finding that shared communications between health services lead to better care for patients and greater job satisfaction for providers (Day, Witt, and Oelke 2016).

Other enablers examined age, income, ethnicity and available transport. The extremities of age (very young and the elderly) were associated with higher rates of obtaining follow-up care (Atzema et al. 2018; Baren et al. 2006; Foster et al. 2018; Straus, Orr, and Charney 1983). Patients with higher incomes were more likely to be compliant with ED instructions and follow-up with their PC provider (Atzema et al. 2018; Broadwater-Hollifield et al. 2015). Ethnicity was another factor influencing follow-up. Baren et al. (2006) found that having Black ethnicity was a characteristic associated with follow-up, whereas Broadwater-Hollifield et al. (2015) found that patients who were adherent to follow-up recommendations were likely non-Hispanic ethnicity or race. Transportation to scheduled medical care also enabled follow-up (Baren et al. 2006; Watson et al. 2017).

4.2 | Barriers to Care Transitions

Insurance status was significantly associated with follow-up noncompliance in two paediatric studies (Ferayorni, Sinha, and McDonald 2011; Wang et al. 2003). Children without health insurance and those born overseas were more likely to have poor access to PC providers, with an odds ratio (95%) of 0.19 (0.08–0.46); $p=0.04$ (Ferayorni, Sinha, and McDonald 2011). Likewise, in the adult cohort, patients who did not receive PC provider follow-up were more likely not to have health insurance also (Qureshi et al. 2012). Similarly, patients with Medicaid fees for service and who were uninsured reported barriers to access to PC providers (Blanchard et al. 2008; Chou et al. 2018). The cost of follow-up was concerning to patients and always impacted their ability to follow the ED recommendations (Broadwater-Hollifield 2015; Hanna et al. 2020; Qureshi et al. 2012). In the United States, foreign-born children who visited the ED, and who did not have medical insurance were less likely to have a regular place for medical care and a regular PC provider (Ferayorni, Sinha, and McDonald 2011). Often, the availability of GP appointments was problematic and a further barrier experienced by elderly patients in two qualitative studies (Hanna et al. 2020; Schenhals, Haidet, and Kass 2019). These findings were duplicated in quantitative studies where patients with a family physician being remunerated via primarily fee-for-service methods were more likely to be seen within 7 days than those who were reimbursed through a primary capitation model (Atzema 2015), and similar findings reported at 30-day follow-up care (Atzema et al. 2018).

Three qualitative studies reviewed communication and patient experiences during the ED discharge process, with adult and elderly patients reporting multiple problems with discharge communications (Hanna et al. 2020; Nielsen et al. 2019; Schenhals, Haidet, and Kass 2019). The emergency department discharge process was reported as challenging for elderly patients because they lacked information and understanding about their diagnosis, expected course of illness, contingency care plan and when and how to follow up with their PC providers (Hanna et al. 2020; Hastings et al. 2012). Some elderly patients felt their concerns were not taken into consideration during the discharge process during their ED episode of care (Hanna et al. 2020; Nielsen et al. 2019). Likewise, Nielsen et al. (2019) and Schenhals, Haidet, and Kass (2019) reported that elderly patients who were not adequately prepared for discharge continue to have health concerns in the community setting not addressed as well; they experienced suboptimal patient–clinician communication, which represented significant barriers to successful care transitions. One mixed-methods study demonstrated a breakdown in communication between EDs and PC providers in the transition of the care process, with setting/environmental constraints negatively impacting communication logistics (Rider et al. 2018).

Patients with low acuity diagnoses and those patients who are less likely to have a long-term condition were significantly associated with follow-up noncompliance (Foster et al. 2018; Wang et al. 2003), often because of patients' perceptions that they did not need further follow-up appointments (Qureshi et al. 2012; Straus, Orr, and Charney 1983). Other barriers to follow-up were that patients were poorly informed about the reason why they needed to follow-up with PC providers (Qureshi et al. 2012).

The systematic review found that following up with primary care after being discharged from the ED can be difficult. Several barriers were identified, including lack of health insurance, issues with reimbursement for primary care providers and the cost of follow-up appointments. Other challenges included difficulties in getting primary care appointments, not having a regular primary care provider, unclear discharge instructions and poor communication between patients and healthcare professionals. Additionally, there were problems with communication among healthcare professionals. The study also found that having health insurance, appropriate payment methods for primary care providers, having a regular primary care provider and improved communication between patients and healthcare professionals could help facilitate follow-up care.

5 | Discussion

This integrative systematic review set out to identify the barriers and enablers of care transition from ED to PC providers. It was evident that the follow-up rates between ED and PC providers varied widely with inconsistent rates of follow-up due to the identified barriers and facilitators in this review. These suboptimal transitions in care involved patients aged across the lifespan, with differing diagnoses, located in both urban and rural settings and reported globally. However, care transition interventions did improve continuity of care with PC providers and follow-up rates because of access to insurance, ease of payment

methods, effective communication, prior booked PC provider appointments and access to transportation.

Although the transfer of care from ED to PC providers is a global challenge, the impact of health insurance was a main factor in this context. The U.S. Department of Health and Human Services (n.d.) highlights that inadequate health insurance is a major obstacle to accessing healthcare. The 2020 Commonwealth Fund International Health Policy Survey revealed that 50% of adults with lower income in the United States skipped necessary medical care due to cost, compared to 12%–15% in other countries (U.S. Department of Health and Human Services n.d.). The 2021 USA National Health Interview Survey found that 7% of individuals faced barriers to obtaining essential medical care because of cost (U.S. Department of Health and Human Services n.d.). Many patients experienced financial toxicity, and the shortfall between fees charged and rebates provided was found to influence PC provider follow-up compliance.

Affordability continues to be a significant factor affecting PC. According to a comparison by Schneider et al. (2021) and Corscadden et al. (2017) of the health system performance of 11 high-income countries, Australia's healthcare system ranks for affordability in the lowest three countries. In Australia, 45.8% of young people stated that the cost of follow-up and health insurance remains one of the primary barriers to accessing timely healthcare (Kang et al. 2020). The percentage of Australian patients who delayed or did not see a GP due to cost increased from 3.5% (2020–22) to 7.0% (2022–2023) (Australian Institute of Health and Welfare 2024).

Having a regular PC provider has been shown to facilitate follow-up post-ED discharge, yet this review identified that many patients faced additional difficulties with the availability of appointments in the community setting. Twenty-seven per cent of Australian adults experienced difficulties with out-of-hours access, which was higher than 5 of 10 comparator countries in Corscadden et al. (2017). Australian Institute of Health and Welfare (2020) reported that in 2016, half of the patients did not see a GP when they felt they needed to as they could not get an appointment.

Internationally, there is significant variability between the demand and supply of the PC provider workforce, which inevitably impacts patient access, clinical outcomes and increased expenditure on emergency care services due to increased usage (Australian Medical Association 2022; Risdon 2023; Robeznieks 2022). While the demand for PC providers is increasing at a rapid rate due to population growth and ageing, and increased prevalence of long-term conditions, such as cancer, cardiovascular disease and diabetes, this problem is a mainstay in healthcare systems internationally, and will only compound the problem even further in years to come (Cowling et al. 2013; Robeznieks 2022).

A further clinically important finding in this review was that often patients did not understand discharge instructions and rationales for the requirement of further PC provider follow-up appointments. This observation underscores and points to

fundamental failings in care, and a lack of patient–clinician communication to optimise supported self-management in the ED setting (Schneider et al. 2021). High-risk patients and marginalised groups, who were particularly vulnerable not to receiving a timely PC provider appointment, were patients in minority groups (Mitchell, Li, and Decker 2023) and older people (Jeffreys et al. 2022; Mitchell, Li, and Decker 2023; Shaw et al. 2013). Likewise, PC providers are at the centre of ongoing care coordination to provide safe and high-quality care.

Patients require timely transitions of care from ED to reduce unavoidable hospitalisations and optimise self-management of long-term conditions, which requires an individualised and multicomponent approach to care coordination. Older people with complex health issues are most likely to undergo multiple transitions of care and are at the highest risk of adverse events. Therefore, time and care taken by members of the multidisciplinary team in the ED setting are imperative to clearly communicate the patient's own role and responsibilities as active partners in their care.

Given the complexities of the barriers to effective care transitions from ED to PC providers highlighted in this review, there is no 'one size fits all' solution to providing and delivering care transitions. A range of strategies are needed and should be considered, nuanced for target groups and sensitive to geographical areas, long-term conditions, disabilities and people with individualised care needs. Interventions that might be considered beneficial and in no order included: educating and supporting patients, families and carers, improved communication and standardised documentation to be included from ED to PC providers, providing patients with PC provider appointments at the point of ED discharge and consideration to assigning case managers or care coordinators for people with complex care needs.

5.1 | Strengths and Limitations

This systematic review has several strengths which included the use of a rigorous and transparent review process, and the reviewers followed a registered systematic review protocol to reduce bias. However, there are several important limitations to acknowledge. Studies were limited to those in the English language, consequently data may have been omitted. We did not include transitions of care to outpatient clinics or transitional clinics as our research question focussed exclusively on barriers and facilitators of care transitions from ED to PC providers.

6 | Conclusions

Barriers to transitions of care are affordability, suboptimal communication between health professionals and a lack of education provided to patients to understand the importance of PC provider follow-up post-ED episode of care. Future recommendations to provide effective transitions of care would be to optimise supported self-management for patients and deliver timely and clear communication with standardised discharge documentation to be shared between ED and PC providers.

This review has identified that the transition of care is complicated and influenced by a range of barriers and facilitators. Clinical practice interventions should integrate a comprehensive approach and be supported by financing mechanisms, provide reliable transfer of discharge care plans, address suboptimal patient-clinician communication in the ED setting to enhance supported self-management for patients and consider case managers and care coordinators for patients living with complex health conditions. There is no one size fits all approach in the delivery of care transitions between ED and PC providers, and future research should target high-risk groups such as older people, those with complex conditions and those from small minority groups.

Author Contributions

Kathleen Hain: conceptualisation, methodology, validation, screening, data extraction, formal analysis, interpretation and writing original draft. **Jennie M. Scarvell:** methodology, validation, screening, interpretation, writing – reviewing and editing and supervision. **Catherine Paterson:** conceptualisation, methodology, validation, screening, data extraction, formal analysis, interpretation, writing original draft, writing – reviewing and editing, supervision.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

All data are available within the existing published studies included and in supplementary files of this paper.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Supplementary Table 1. Completed Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pages 3 to 5
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Pages 5 and 6
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pages 6 to 7
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.	Page 7
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Supplementary Table 1
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.	Pages 8 to 9
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.	Pages 8 to 9
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.	Pages 8 to 9
	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.	Table 1
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.	Pages 8 to 9 and Table 2
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.	Qualitative
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Figure 1, Table 1
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Table 1, STable 2,
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Table 1, Stable 2
	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.	Page 10 and Table 2
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	N/A
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Table 2
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Table 1, page 8

Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Qualitative
RESULTS			
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.	Figure 1, Pages 9 to 10
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Figure 1
Study characteristics	17	Cite each included study and present its characteristics.	Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Table 1, Table 2
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.	Table 1
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Table 1
	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.	N/A
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Table 1, Pages 11 to 19
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Table 2
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	STable 2
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pages 17 to 21
	23b	Discuss any limitations of the evidence included in the review.	Page 20
	23c	Discuss any limitations of the review processes used.	Page 20
	23d	Discuss implications of the results for practice, policy, and future research.	Pages 20 to 22
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 6
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 6
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Page 6
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	N/A
Competing interests	26	Declare any competing interests of review authors.	N/A
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.	Software declared in methods

Supplementary Table 2. Search strategy

Database: MEDLINE			
Symbols used in this document:			
" " - finds a phrase			
Asterisk (*) - finds various endings to a word stem			
AB – Abstract			
TI - Title			
MH - Main Heading (MeSH heading)			
+ - explodes the Main Heading			
Search #	Concept/Explanation	Search Terms/Strategy	# of Results
#1	Emergency departments	AB (emergency N5 (department OR room OR accident)) OR "casualty department" OR "ED" OR "ed " OR "a and e" OR "ER" OR "ers" OR "emergency treatment" OR "emergency medicine" or "accident department" OR "trauma centre" OR "trauma center" OR "urgency service")	275227
#2		TI (emergency N5 (department OR room OR accident)) OR "casualty department" OR "ED" OR "ed " OR "a and e" OR "ER" OR "ers" OR "emergency treatment" OR "emergency medicine" or "accident department" OR "trauma centre" OR "trauma center" OR "urgency service")	74626
#3		MH ("emergency service, hospital+")	158886
#4		MH ("emergency medical services+")	91871
#5		#1 OR #2 OR #3 OR #4	384952
#6	Discharged patients and/or care transition	AB ("patient discharge" OR "transition of care" OR "transfer of care" OR "care transition*" OR "patient transition*" OR "continuity of care" OR "patient care" OR "patient care planning" OR "continuity of patient care" OR "patient handoff" OR "handoff" OR "care coordination" OR "handover" OR "follow-up" OR "followup" OR "follow up instructions" OR "follow-up instructions")	1134931

Supplementary Table 2. Search strategy

#7		TI ("patient discharge" OR "transition of care" OR "transfer of care" OR "care transition*" OR "patient transition*" OR "continuity of care" OR "patient care" OR "patient care planning" OR "continuity of patient care" OR "patient handoff" OR "handoff" OR "care coordination" OR "handover" OR "follow-up" OR "followup" OR "follow up instructions" OR "follow-up instructions")	124632
#8		MH ("Patient Discharge+")	35512
#9		#6 OR #7 OR #8	1218033
#10	Primary health care	AB ("primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice")	164720
#11		TI ("primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice")	91909
#12		MH ("Primary Health Care+")	180090
#13		#10 OR #11 OR #12	317599
#14	Barriers and enablers	AB (barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up*")	3559278
#15		TI (barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up*")	642737
#16		#14 OR #15	3841794
#17	Care transition from emergency departments to primary health care, barriers, enablers, patient characteristics	#5 AND #9 AND #13 AND #17 AND #20	3880

Supplementary Table 2. Search strategy

	LIMITS – English, peer reviewed, full text	644
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Database: Cumulative Index to Nursing and Allied Health Literature (CINAHL)

Date of search: 19.3.22

Supplementary Table 2. Search strategy

Symbols used in this document:			
" " - finds a phrase			
Asterisk (*) - finds various endings to a word stem			
MH - Main Heading (CINAHL heading)			
AB Abstract			
TI Title			
+ - explodes the Main Heading			
Search #	Concept/Explanation	Search Terms/Strategy	# of Results
#1	Emergency departments	AB (emergency N5 (department OR room OR accident)) OR "casualty department" OR "ED" OR "ed" OR "a and e" OR "ER" OR "ers" OR "emergency treatment" OR "emergency medicine" or "accident department" OR "trauma centre" OR "trauma center" OR "urgency service"	99181
#2		T1 (emergency N5 (department OR room OR accident)) OR "casualty department" OR "ED" OR "ed" OR "a and e" OR "ER" OR "ers" OR "emergency treatment" OR "emergency medicine" or "accident department" OR "trauma centre" OR "trauma center" OR "urgency service"	52495
#3		MH ("Emergency Service+")	67964
#4		MH ("emergency medical services+")	113993
#5		#1 OR #2 OR #3 OR #4	193249
#6	Discharged patients and/or care transition	AB ("patient discharge" OR "transition of care" OR "transfer of care" OR "care transition*" OR "patient transition*" OR "continuity of care" OR "patient care" OR "patient care planning" OR "continuity of patient care" OR "patient handoff" OR "handoff" OR "care coordination" OR "handover" OR "follow-up" OR "followup" OR "follow up instructions" OR "follow-up instructions")	325295
#7		TI ("patient discharge" OR "transition of care" OR "transfer of care" OR "care transition*" OR "patient transition*" OR "continuity of care" OR "patient care" OR "patient care planning" OR "continuity of patient care" OR "patient handoff" OR "handoff" OR "care coordination" OR "handover" OR "follow-up" OR "followup" OR "follow up instructions" OR "follow-up instructions")	47506

Supplementary Table 2. Search strategy

#8		MH ("Patient Discharge+")	34635
#9		#6 OR #7 OR #8	380497
#10	Primary health care	AB "primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice"	87193
#11		TI "primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice"	50697
#12		MH "Primary Health Care"	70250
#13		#9 OR #10 OR #11	136081
#14	Barriers and enablers	AB barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up*"	1008717
#15		TI barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up*"	254129
#16		#14 OR #15	1125886
#17	Care transition from emergency departments to primary health care, barriers, enablers,	#5 AND #9 AND #13 AND #16	983
		Limits English, Full text, Peer reviewed	249

Supplementary Table 2. Search strategy

Database: Proquest Nursing and Allied Health database			
Date of search: 19.3.22			
Symbols used in this document:			
TI – Searching the Title and Abstract fields			
AB - Abstract			
“ ” - finds a phrase			
Asterisk (*) - finds various endings to a word stem			
MH - Main Heading (MeSH heading)			
+ - explodes the Main Heading			
Search #	Concept/Explanation	Search Terms/Strategy	# of Results
#1	Emergency departments	AB (emergency N5 (department OR room OR accident)) OR “casualty department” OR “ED” OR “ed “ OR “a and e” OR “ER” OR “ers” OR “emergency treatment” OR “emergency medicine” or “accident department” OR “trauma centre” OR “trauma center” OR “urgency service”	48079
#2		TI (emergency N5 (department OR room OR accident)) OR “casualty department” OR “ED” OR “ed “ OR “a and e” OR “ER” OR “ers” OR “emergency treatment” OR “emergency medicine” or “accident department” OR “trauma centre” OR “trauma center” OR “urgency service”	13924
#3		MH (“Emergency Service,Hospital+”)	5194
#4		MH (“emergency medical services+”)	2380
#5		#1 OR #2 OR #3 OR #4	60694
#6	Discharged patients and/or care transition	AB (“patient discharge” OR “transition of care” OR “transfer of care” OR “care transition*” OR “patient transition*” OR “continuity of care” OR “patient care” OR “patient care planning” OR “continuity of patient care” OR “patient handoff” OR “handoff” OR “care coordination” OR “handover” OR “follow-up” OR “followup” OR “follow up instructions” OR “follow-up instructions”)	203202
#7		TI (“patient discharge” OR “transition of care” OR “transfer of care” OR “care transition*” OR “patient transition*” OR “continuity of care” OR “patient care” OR “patient care planning” OR “continuity of patient care” OR “patient handoff”	22055

Supplementary Table 2. Search strategy

		OR "handoff" OR "care coordination" OR "handover" OR "follow-up" OR "followup" OR "follow up instructions" OR "follow-up instructions")	
#8		MH ("Patient Discharge")	2294
#9		#6 OR #7 OR #8	214373
#10	Primary health care	AB ("primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice")	60700
#11		TI ("primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice")	24899
#12		MH ("Primary Health Care")	5832
#13		#10 OR #11 OR #12	71337
#14	Barriers and enablers	AB (barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up*" OR "patient compliance")	710344
#15		TI (barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up*" OR "patient compliance")	125430
#16		#14 OR #15	752704
#17	Care transition from emergency departments to primary health care, barriers, enablers,	#5 AND #9 AND #13 AND #16	335
		LIMITS English, peer reviewed, full text	190

Supplementary Table 2. Search strategy

Database: PsycINFO			
Date of search:			
Symbols used in this document:			
“ ” - finds a phrase			
Asterisk (*) - finds various endings to a word stem			
T1 Title			
AB Abstract			
Search #	Concept/Explanation	Search Terms/Strategy	# of Results
#1	Emergency departments	T1 (emergency N5 (department OR room OR accident)) OR “casualty department” OR “ED” OR “ed “ OR “a and e” OR “ER” OR “ers” OR “emergency treatment” OR “emergency medicine” or “accident department” OR “trauma centre” OR “trauma center” OR “urgency service”	45542
#2		AB (emergency N5 (department OR room OR accident)) OR “casualty department” OR “ED” OR “ed “ OR “a and e” OR “ER” OR “ers” OR “emergency treatment” OR “emergency medicine” or “accident department” OR “trauma centre” OR “trauma center” OR “urgency service”	142921
#3		#1 OR #2	171914
#4	Discharged patients and/or care transition	T1 “patient discharge” OR “transition of care” OR “transfer of care” OR “care transition*” OR “patient transition*” OR “continuity of care” OR “patient care” OR “patient care planning” OR “continuity of patient care” OR “patient handoff” OR “handoff” OR “care coordination” OR “handover” OR “follow-up” OR “followup” OR “follow up instructions” OR “follow-up instructions”	17045
#5		AB “patient discharge” OR “transition of care” OR “transfer of care” OR “care transition*” OR “patient transition*” OR “continuity of care” OR “patient care” OR “patient care planning” OR “continuity of patient care” OR “patient handoff” OR “handoff” OR “care coordination” OR “handover” OR “follow-up” OR “followup” OR “follow up instructions” OR “follow-up instructions”	140478
#6		#4 OR #5	146519

Supplementary Table 2. Search strategy

#7	Primary health care	AB "primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice"	16118
#8		TI "primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR "primary care practice" OR "family practice" OR "physician, primary care" OR "physician, family" OR "primary care provider" OR "primary care practice" OR "primary care setting" OR "general practice"	41741
#9	#7 OR #8		44039
#10	Barriers and enablers	AB barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up**"	210637
#11		TI barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR "follow up**"	1228214
#12		#10 OR #11	1270133
#13	Care transition from emergency departments to primary health care, barriers, enablers	#12 AND #9 AND #6 AND #3	307
		Limits: English, Full Text, Peer Reviewed	63

Supplementary Table 2. Search strategy

Database: Scopus			
Date of search: 19.3.22			
Symbols used in this document:			
" " - finds a phrase			
AB Abstract			
TI Title			
Asterisk (*) - finds various endings to a word stem			
Search #	Concept/Explanation	Search Terms/Strategy	# of Results
#1	Emergency departments	TI: "emergency department" OR "Emergency room" OR "emergency accident" OR "casualty department" OR "ED" OR "ed" OR "a and e" OR "ER" OR "ers" OR "emergency treatment" OR "emergency medicine" or "accident department" OR "trauma centre" OR "trauma center" OR "urgency service"	134792
#2		AB: "emergency department" OR "Emergency room" OR "emergency accident" OR "casualty department" OR "ED" OR "ed" OR "a and e" OR "ER" OR "ers" OR "emergency treatment" OR "emergency medicine" or "accident department" OR "trauma centre" OR "trauma center" OR "urgency service"	416867
#3		#1 OR #2	480333
#4	Discharged patients and/or care transition	TI: "patient discharge" OR "transition of care" OR "transfer of care" OR "care transition*" OR "patient transition*" OR "continuity of care" OR "patient care" OR "patient care planning" OR "continuity of patient care" OR "patient handoff" OR "handoff" OR "care coordination" OR "handover" OR "follow-up" OR "followup" OR "follow up instructions" OR "follow-up instructions"	155109
#5		AB: "patient discharge" OR "transition of care" OR "transfer of care" OR "care transition*" OR "patient transition*" OR "continuity of care" OR "patient care" OR "patient care planning" OR "continuity of patient care" OR "patient handoff" OR "handoff" OR "care coordination" OR "handover" OR "follow-up" OR "followup" OR "follow up instructions" OR "follow-up instructions"	1340868
#6		#4 or #5	1406728
#7	Primary health care	TI: "primary care" OR "primary health care" OR "primary healthcare" OR "general practitioner" OR "family physician" OR "primary care physician" OR	125787

Supplementary Table 2. Search strategy

		“primary care practice” OR “family practice” OR “physician, primary care” OR “physician, family” OR “primary care provider” OR “primary care practice” OR “primary care setting” OR “general practice”	
#8		AB:"primary care" OR "primary health care" OR "primary healthcare" OR “general practitioner” OR “family physician” OR “primary care physician” OR “primary care practice” OR “family practice” OR “physician, primary care” OR “physician, family” OR “primary care provider” OR “primary care practice” OR “primary care setting” OR “general practice”	231973
#9		#7 OR #8	285559
#10	Barriers and enablers	TI: barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR “follow up*”	8282235
#11		AB: barrier* OR enable* OR facilitat* OR experienc* OR communicat* OR adherence OR compliance OR “follow up*”	1377071
#12		#10 OR #11	8823042
#13	Care transition from emergency departments to primary health care, barriers, enablers,	#12 AND #9 AND #6 AND #3	567
		Limits: English, Full text, Peer reviewed	55

Date of search: 19.3.22

Supplementary Table 2. Search strategy

Supplementary Table 3. Barriers and facilitators of care transitions from ED to PC

Study, Year, Country	Clinical Setting	Study Design	Participants	Outcomes/Enablers	Outcomes/Barriers
Afilalo et al., 2007 Canada	Urban University teaching hospital. Annual Number of ED presentations: 60,000	Quantitative Interventional – 4 period cross over cluster RCT Intervention group: FPs received reports via web based standardised communication system. Control group: received mailed copies of ED notes. Intervention: web based communications system. Single intervention Location: in ED	n = 23 FP Practices n = 2,022 ED visits (1,048 intervention, 974 control) – representing 1616 patients. Inclusion criteria: Age: not reported Diagnosis: not reported Time period; not reported ED visit Each FP had a minimum of 100 patients visits annually to the hospital ED. Exclusion criteria: not reported.	Intervention group: Significant improvement in continuity of care. Received information regarding ED visit more often (OR 3.14, 95% CI 2.6-3.79). Found the information more useful (OR 5.1, 95%, CI 3.49-7.46). Possessed a better knowledge of the ED visit (OR 6.28, 95%CI 5.12-7.71). Felt they could better manage patients (OR 2.46, 95% CI 2.02- 2.99). Initiated actions more often following receipt of information (OR 1.62 95% CI 1.36-1.93). <i>p</i> value: not reported.	No significant difference in the follow-up rates with FP (OR 1.25, 95% CI 0.97-1.61). <i>p</i> values: not reported
Atzema et al., 2015 Canada	Urban/Rural 157 non paediatric EDs in Ontario, Canada	Quantitative Non-Randomised Study. Retrospective cohort study	n = 14,907 patients Inclusion criteria: Age: 18 years +, Diagnosis of AF, Time period: 1.4.2007 and 31.3.2012, Valid Ontario Health Care Number. Exclusion criteria: Patients who died in the ED, patients who were admitted to hospital, specialty ED departments (i.e., only paediatric or mental health) and those that were not open 24 hours day, patients who were given a lower acuity score (CTAS score of 4 or 5) and patients with hx of AF or flutter as defined as an ED visit, hospitalisation or outpatient visit for AF or flutter in the 5 years before the index date.	Not reported.	Using patients with a FP belonging to a primarily fee-for-service remuneration model as the comparison group, patients with a FP belonging to a capitation-based FHN, as part of a FHT, were less likely to receive timely follow-up care (OR 0.73, 95% CI 0.62–0.86) <i>p</i> = 0.001, as were those whose FP belonged to the same model type that was not part of a FHT, (OR 0.77, 95% CI 0.60–0.97), <i>p</i> = .03 At 30 days, 2,678 patients (18.0%) had not obtained follow-up care. Of the 14146 patients with a FP 6473 (43.4%) obtained follow up with 30 days. Lack of FP had the largest independent association with acquiring timely follow-up care (OR 0.58 95% [CI] 0.50-0.69). <i>p</i> value not reported.

<p>Atzema et al., 2018 Canada</p>	<p>Urban/Rural 157 non paediatric ED</p>	<p>Quantitative Non Randomised Study. Retrospective cohort study.</p>	<p>n = 41,485 ED visits Inclusion Criteria: Age: 18 years + Diagnosis: New AF, HTN, HF Time period: 1.4.2007 to 31.3.2014 Valid Ontario Health Care Number. Exclusion criteria: repeat visits, patients with low ED acuity triage score, those admitted to hospital, died in the ED, speciality EDs, and those not open 24 hours daily. Excluded patients with an ED diagnosis for each disease if hx of that disease defined as an ED visit, hospitalisation, or outpatient visit for that disease in the five years prior to the index date.</p>	<p>47%: (95% CI 46.5-47.5) patients obtained follow up with FP, cardiologist, or an internist within a week of discharge, with 78.7% (95% CI 78.3-79.1) obtaining care within 30 days. Most of the care was provided by FPs.</p> <p>In the model limited to patients who had a FP, older age, higher income status, hx of one of the ambulatory sensitive cardiovascular conditions were associated with improved frequency of follow up care.</p> <p>EP characteristic associated with follow up care was EP speciality: patients who saw EP with five years of speciality training in emergency medicine were 11% more likely to obtain seven day follow up care than those who were seen by a physician with family medicine training. Among FP characteristics, the more years in practice with a 10% higher adjusted association with obtaining follow up care as compared with those whose FP had been practicing for five years or less.</p> <p>Remuneration method, patients whose FP used capitation model had a 15%-28% lower hazard of obtaining follow-up care within a week, as compared with those whose FP use enhanced fee-for-service models. Patients whose FP were remunerated through simple fee-for-service had a 9% lower risk of obtaining seven-day care than those whose physicians had enhanced fee-for-service models. Patients seen at small hospitals had a slightly (8%) lower hazard of receiving seven-day follow-up care, as compared with community hospitals</p> <p>p values not reported</p>	<p>In the seven day follow up care model, the lack of FP had the strongest association with obtaining follow up care, with an adjusted hazard ratio HR of 0.58 (95% CI 0.54-0.63). In the model limited to patients who had a FP, patients with a hx of RF, dementia, stroke, CAD, COPD, and cancer had a lower association with obtaining follow up care within a week as did patients with a rural residence and low socioeconomic status.</p> <p>The findings were similar for the 30-day models. The factor with the strongest association with follow-up care was again a lack of a family physician (HR 0.61, 95% CI 0.58-0.65). p values not reported</p>
<p>Baren et al., 2001 USA</p>	<p>Urban University teaching hospital Annual number of ED presentations: 47,000</p>	<p>Interventional -RCT. Intervention group: received free 5-day course of prednisone, vouchers for transportation to and from their PCP, and a 48-hour telephone reminder to make an appointment with their PCP. Control group: usual care.</p>	<p>n = 192 patients enrolled, intervention group (n=98), control group (n=94). 178 (93%) completed follow up. Inclusion criteria: Age: 16-45 years Diagnosis: asthma Time period: 5.3.1998 to 15.11.98.</p>	<p>Intervention groups were significantly more likely to follow up with their PCP than control patients (RR 1.6; 95% confidence interval [CI] 1.1, 2.4). When adjusted for other factors influencing PCP follow-up care (ethnicity, prior PCP relationship, insurance status, regular car access), intervention patients were more likely to follow up with their PCP (OR 3.1; 95% CI 1.5, 6.3).</p> <p>p values not reported.</p>	<p>Not reported.</p>

		Intervention: free 5 day course of prednisone, transport vouchers, reminder to make an appointment with PCP Multi component In and post ED	Exclusion criteria: Unable/unwilling to provide informed consent, non – English speaking, previously enrolled in the study, nor admitted for inpatient care.		
Blanchard et al., 2008 USA	Urban Not hospital based	Quantitative Descriptive Study. Observational - survey	n = 250 phone calls to 163 clinics Age: 40-year-old Diagnosis: HTN Time period: not reported Hypothetical patient presenting with a scripted presentation Exclusion criteria: not reported	71% of calls using privately insured patients resulted in appointment Vs 36.6% for Medicaid fee-for-service ($p=0.002$). Uninsured callers had only 13% success rate when considering out-of-pocket limitations of less than \$50.	Medicaid fee for service was associated with a significantly lower rate of successful appointments (36%) than private insurance ($p = .002$). The uninsured scenario, when out-of-pocket (\$50) and time (within seven days) restrictions were considered, yielded only 10.8% of calls resulting in appointments ($p < .001$) compared with the privately insured group). The scenario involving an uninsured patient seeking an appointment at a safety net clinic (DC Alliance) resulted in a 27% success rate when cost and time restrictions were considered ($p = .002$) compared with the privately insured group.
Broadwater-Hollifield et al., 2015 USA	Urban University teaching centre. Annual number of ED presentations: 40,000	Quantitative, Non-Randomised Study. Prospective, observational study	n = 442 Inclusion criteria: Age: 18 years +, Diagnosis: not reported Time period: 1.1.2013 to 31.8.2013. English speaking deemed psychologically and medically stable by the ED care provider. Exclusion criteria: prisoners, brought in by emergency medical services transportation due to possible severity of illness, or incapacitated by medical illness.	Patients who were adherent to follow-up recommendations were more likely to have PCP (odds ratio [OR], 2.6; 95% confidence interval [CI], 1.1-6.1, $p = .03$), have an annual income of greater than \$35,000 (OR, 2.9; 95% CI, 1.2-7.2), $p = .02$, and report a non-Hispanic ethnicity or race (OR, 2.8; 95% CI, 1.1-7.1), $p = .03$	Individuals who reported that cost “sometimes” or “always” impacts their ability to follow their physician's recommendations were significantly less likely to comply with ED recommendations (OR, 2.7; 95% CI, 1.3-5.6,) $p = .01$

Chou et al., 2018 USA	Urban Primary care practices	Quantitative Descriptive Study. Audit.	n = 49 practices 536 phone calls Inclusion criteria: all primary care practices in the cities of New Haven, East Haven, West Haven, North Haven, and Hamden, in the state of Connecticut. Age: not reported Diagnosis: lower back pain, HTN Time period: 1.10.2015 to 31.5.2016. Exclusion criteria: practices serving special populations	Callers were more likely to obtain an appointment in 7 days from practices offering after-hour appointments (36.3% vs. 27.8%, $p = .04$). Of calls with commercial insurance, 38.3% (67/175) secured an appointment within 7 days, significantly higher than 24.7% (45/182) of Medicaid calls ($p = .01$).	Overall, 167/536 calls (31.2%) obtained an appointment in 7 days. Practices with PCMH designation were less likely to offer appointments within 7 days (23.4% vs. 33.1%, $p = 0.03$). In contrast, practices with after-hours appointments were more likely to offer appointments within 7 days to callers than those without after-hours appointments (36.3% [77/212] vs. 27.8% [90/324], $p = .04$). After adjusting for insurance type, there were no significant associations between practice improvements and 7-day appointment availability or appointment wait time.
Day et al., 2016 Brazil	Urban	Qualitative Study. Descriptive exploratory research	n = 14, including interns of health disciplines, advisors of interns, nurses, and physicians from the ED and PHC Family Unit. Seven from the ED and from PHC services.	Learning about each other's work setting Integration and communication Benefits for the patient Established interprofessional relationships, promoted communications, offering knowledge about the work in different services and teams within the health system.	Not reported.
DeRemer et al., 2021 USA	Rural University teaching hospital Annual number of ED	Quantitative Study Non Randomised Study. Retrospective.	n = 41 Inclusion criteria: Age: not reported Diagnosis: not reported Time period: over 4 weeks Active clinic patients who sought acute level care at ED or	The result of these efforts increased the communication with patients and resulted in a 26% (10/38) increase in follow-up appointments scheduled with a total increase of an additional 7 patients adhering to follow-up transitional appointment. p values not reported	Not reported.

	presentations: not reported		urgent centres with the University of Florida Health System, not admitted to hospital Exclusion criteria: patients with mental health related acute presentation, patients with appointment were contacted only to confirm the follow up.		
Ferayorni et al., 2010 USA	Urban University teaching hospital Paediatric ED Annual number of ED presentations: 21,000	Quantitative Non-Randomised Study. Cross sectional study.	n = 385 patients Inclusion criteria: Age: Birth to 18 years Diagnosis: not reported Time: 1.10.2006 to 31.11.2006. Exclusion criteria: Children who presented with multiple traumas requiring trauma team activation, or with life-threatening medical conditions, incarcerated children, parents, or guardians of children who refused to be interviewed and those who were unable to understand or fully participate in the informed consent process.	Not reported.	Children with no health insurance, and those children who were foreign born were more likely to have poor access to care with odds ratio (95% CI) of 0.19 (0.08–0.46), $p = 0.00$, and 0.35 (0.13–0.95), $p = 0.04$, respectively Significant proportions of uninsured children visiting our PED are born in Mexico and from low-income immigrant families, many do not qualify for public insurance, have poor access to care, and use the Paediatric ED for their healthcare needs.
Foster et al., 2018 USA	Urban University teaching hospital Annual number of ED presentations: 80,000	Quantitative Non-Randomised Study. Retrospective cohort study	n = 2,142 referrals for 2,064 patients to care coordination specialist. Inclusion criteria: Aged: over 18 years Diagnosis: not reported Time period: 1.1.2010 to 31.12.2010. Exclusion criteria: those under the age of 18, those identified as prisoners, and patients who cited "legal troubles" as a barrier to primary care access.	Of the 2,142 patient referrals, 1688 accepted assistance (79%, CI 95 77% to 81%) from the program. Linkage was successful for 1059/1688 (63%, CI 95 60% to 65%). p values not reported	Unlinked patients were slightly younger, with a mean age of 41 (SD 12) than linked patients, mean age 45 (SD 12) (difference in means 3 years, CI 95 2 to 3) and more often male (62% compared to 56%, difference 7%, CI 95 2% to 12%). Unlinked patients were also less likely to have a chronic medical condition compared to linked patients (37% vs 45%, difference 8%; CI 95 3% to 12%). p values not reported
Grimholt et al., 2015 Norway	Five EDs and general practices	RCT. Intervention group: scheduled appointment with GP within 1 week of ED discharge, and at	n = 202 patients, 101 to intervention, 101 to control group. Inclusion criteria:	Patients in the intervention group received significantly more consultations than the control group (mean 6.7 vs. 4.5, $p = 0.004$). The intervention group was significantly more satisfied with the time their GP	Not reported.

		least five scheduled appointments consultations over the next 6 months. GPs received guidelines with suggestions for assessing and managing patients. Control group: received usual care	Ages: 18–75, Diagnosis: deliberate self-poisoning, Time period: Not reported Registered with a GP, and discharged directly to home, thus enabling follow-up by a GP. Exclusion criteria: patients with present psychosis, mental retardation, organic cognitive impairment and those unable to fill in the questionnaire because it was not written in their native language.	took to listen to their personal problems (93.1 % vs. 59.4 %, $p = 0.002$) and with the fact that the GP included them in medical decisions (87.5 % vs. 54, 8 % ($p = 0.009$)). The intervention group was significantly more satisfied with the treatment in general than the control group (79% Vs. 51%), $p = .026$.	
Hanna et al., 2020 Australia	Urban Suburban Hospital Annual number of ED presentations: 36,000	Qualitative Descriptive Study	n = 100 Inclusive criteria: Age: 65 years and older Diagnosis: not stated Time: 1.5.2018 to 30.6.2018; female; admitted to the ED with ATS of 3,4, or 5, discharged from the ED directly back into the community and receiving an explicit GP follow up instruction in the discharge summary.	Perceived benefits included previous experiences with the healthcare system, pre-existing health-seeking behaviours, and ED messaging.	Perceived costs included inconvenience caused to self and others, access to transport options and the availability of a patient's GP.
Hasting et al., 2012 USA	Veteran Affairs Medical Centre ED, Annual numbers of ED presentations: not reported	Quantitative Descriptive Study-Survey.	n = 305 veterans. Inclusion criteria: Age:65 +, Diagnosis: not stated Time: 25.10.2008 to 7.3.2010. Exclusion criteria: had previously refused study participation or were already enrolled; had no visits (other than ED) to the study facility in the previous 12 months (because these were more likely to be visits to establish care rather than for acute illness or injury); were seen for	Not reported.	Patients or their proxies reported not understanding information about their ED diagnosis (21%), expected course of illness (50%), contingency plan (43%), and how soon they needed to follow-up with their primary care provider (25%). In models adjusted for age and race, a positive association was observed between perceived understanding of the cause of the problem (OR= 2.3; 95% CI [1.3 to 4.0]), expected duration of symptoms (OR=1.6; 95% CI [1.0 to 2.5]) and the contingency plan (OR 2.2; CI 1.3 to 3.4), and understood how soon to see PCP (OR =1.3, 95% CI [0.8 – 2.3]).

			nurse visit or medication refills only; were discharged to a location other than home (because discharge information may have been given directly to personnel at the accepting facility, instead of the patient or their family); left before the visit was completed, or did not have a valid telephone number.		
Hunchak et al., 2015 Canada	Urban Annual ED presentations: not reported	Mixed Methods Study	n = 9 FP Prepilot chart audit of 300 charts from 10 FP offices. Data collected for 1 year post introduction of web portal. After 235 patient ED visits, users completed standardised written survey and focus groups with 10 structured questions.	Prepilot audit: 270 charts. 17 patient charts were missing, 34 (13.4%) contained information relating to the patients' ED visit., 44% n= 112 of the audited charts contained any record of the patients' visit to the ED. Pilot phase: 880 visits 858 (97.5%) consented to electronic release of ED records to FP, email notified FP of ED visit 100% of the time, records accessed online by FP 60.7% of the time., and of these 23.6% were accessed more than once. Post pilot survey – 100% FP either “always” (89%) or “often “(11%) aware of their patients ED visit.100% used portal “always” (44%) or “regularly (56%) to access patients' health records online <i>p</i> values not reported	Not reported.
Merritt et al., 2020 USA	Urban, University teaching hospital Annual number of ED presentations 71,000 annual ED	Quantitative, RCT Intervention groups: a PC appointment booked through the booking website prior to ED discharge, written information on how to use the booking website Control group: usual care (i.e. standard follow-up instructions).	n = 272 enrolled subjects, 185 completed follow-up. Inclusion criteria: Age: 18 years +, Diagnosis: not reported Time: 5.11.2015 to 26.6.2017 Discharged from the ED, private or public health insurance, spoke English, had email address, reported that they did not have a PC provider or reported that they had one but wanted new uninsured, no PC provider (or wanted a new PC provider) and the ED provider considered PC follow-up within 14 days as important.	68% completed the two-week telephone follow-up interview. The self-reported PCP follow-up rate was higher (52%) among subjects whose appointment was booked on the website before ED discharge (RD = 16%; 95% CI -1%, 34%) and lower (25%) for subjects who received booking website information (RD = 13%; 95% CI -32%, 7%) compared to subjects (36%) in the usual care group. A higher percentage of subjects in the booking group were more likely to report being extremely or very satisfied with obtaining a PC appointment (78%) compared to those who received booking website information (54%) or usual care (40%). <i>p</i> values not reported	Not reported.

			Exclusion criteria: patients who did not want a PC provider; (2) did not want to schedule a PC follow-up visit; (3) no email access; (4) prisoner; (5) psychiatric chief complaint; or (6) had Kaiser health insurance since Kaiser was not listed on the booking website used in this study.		
Nielsen et al., 2019 Denmark	Urban University teaching hospital Annual number of ED presentations: not reported	Qualitative Study	n = 11 interviews, patients were in intervention group daily activities were assessed, referred for further rehabilitation in primary care and a follow up home visit the day after discharge. Inclusion criteria: Age: over 65+, Diagnosis: not reported Time period: Discharged directly to their own home from a short stay unit at the ED, living in a larger municipality in Denmark. Exclusion criteria: terminal illness, severe dementia or being unable to speak and understand Danish.	In the participants perspective it was difficult, due to fatigue and pain, to perform daily activities after discharge. Participants who experienced not being prepared and clarified in relation to their discharge continued to have concerns for the future. Experienced some challenges related to lack of being involved and lack of receiving the information needed.	Not reported.
Quershi et al, 2012 Australia	Urban Tertiary referral hospital Annual number of ED presentations: 60,000	Quantitative Non-Randomised Study. Observational - Prospective cohort study.	n = 217. Inclusion criteria: Age:18 years + , Diagnosis: not reported Time: 29.6.2011 to 31.12.2011, treating doctor required them to follow up with a GP for ongoing medical care. Exclusion criteria: nursing home patients, and patients with intellectual disability who would be unable to understand, consent and	Not reported.	103 participants (47%, 95% CI 41–54%) who followed up with a GP and 114 (53%, 95% CI 46–59%) who did not. Compared with participants who did follow up, those who failed to follow up were less likely to have an EMU admission (OR 0.46, 95% CI 0.22–0.93, P<0.03), a regular GP (OR 0.16, 95% CI 0.08–0.35, <0.001), health insurance (OR 0.41, 95% CI 0.20–0.82, P<0.01) or awareness of the reason why they were supposed to follow up (OR 0.25, 95% CI 0.11–0.54, P<0.001).

			comply with instructions from ED.		
Rider et al., 2018 USA	Academic and community physicians at eight different sites across USA.	Mixed Method Study prospective study using semi structured interviews.	n = 49 PCPs and 52 EPs, totalling 102 interviews Time: 11.11.2014 and 28.2.2015.	Not reported.	Significant differences exist between EPs and PCPs in the transition of care process. EPs preferred telephone contact synchronous to the encounter whereas PCPs preferred using the EMR asynchronous to the encounter. Providers believe EP-to-PCP contact is important for improving patient care, but report varied expectations and multiple barriers to effective communication.
Schenhals et al., 2018 USA	Suburban/Rural Teaching Hospital Annual ED visits: not reported	Qualitative study	n = 22 Inclusion criteria: Age: 18 years +, Diagnosis: abdomen related Time: 1.5.2015 to 30.9.2016. Exclusion criteria: pregnancy, residence in a nursing home or other extended care facility, inability to consent, inability to speak English, incarceration, or previously having been included in the study.	Failure to ensure clarity about diagnosis at the time of discharge from the ED, Failure to identify patients' feelings of hopelessness. Difficulty in scheduling follow up appointments. Importance of clear discharge process.	Not reported.
Schrader et al., 2019 USA	Urban Tertiary referral centre Annual number of ED presentations: 120,000.	Quantitative Non-Randomised Study. Retrospective observational study.	n = 227,627 patients Inclusion criteria: all patients discharged from the ED Ages: Lifespan Diagnosis: not reported Time period: 1.1.2015 to 31.12.2017 Exclusion criteria: patients who were admitted, expired, transferred to other facilities, left without being seen, eloped, or left against medical advice, prisoners.	Fifty-eight percent of patients receiving charity insurance had PCP visits in comparison to 23% of patients without charity insurance ($p < 0.001$). Seventy-seven percent of patients with charity insurance and PCP assignments completed post-ED discharge PCP visits in comparison to only 4.5% of those with neither charity insurance nor PCP assignments ($p < .001$).	Not reported.
Sharp et al., 2014 USA	Suburban teaching hospital. Number of ED presentations: 80,000 annual	Mixed method study Control group: receive the usual care discharge instructions only. Intervention group: receive a reminder e-mail message the day after the ED visit. Patients then	n = 577 patients. Control group 295 patients, intervention group 282 patients. Inclusion criteria: Age :18 years +, Diagnosis: not reported	33% of the intervention group and 32% of the control group followed-up as recommended (RR = 1.04, 95% CI [0.81, 1.33]), $p=0.78$, 52% of the intervention group and 48% of the control group followed-up within 10 days of the recommended time (RR = 1.08, 95% CI [0.91,1.29]) $p= 0.38$. The 334 patients (57%)	Not reported.

	ED presentations.	completed a telephone survey 2 weeks after their ED visits.	<p>Time period: 25.9.2012 and 28.2.2013</p> <p>have PCP in the Integrated Health Associates group, have an ESI of 2, 3, or 4, report English as primary language, report holding at least one e-mail account.</p> <p>Exclusion criteria: in prison or institutionalized, under temporary or permanent custodianship, or presented with mental health related chief complaint.</p>	<p>successfully contacted via telephone demonstrated a high interest in receiving future e-mail reminders (75%), with the group that received e-mail reminders more likely to want one in the future than those who did not receive e-mail reminders (82.5% vs. 69.76%) $p = 0.04$</p>	
Smith et al, 2004 USA	Urban Paediatric ED Annual presentations: not reported	Quantitative - Interventional - RCT Control group: no intervention. Intervention group: combination of telephone coaching and monetary incentive.	<p>Inclusion criteria: Age: 2 to 12 years of age, Diagnosis: asthma Time period: 1.2.1999 and 31.5.2001. No medical insurance Exclusion criteria: admission to hospital at the time of the ED visit, chronic illness other than asthma, no working telephone in home, participation of this child or another child in the same household in this or another asthma study, no primary care provider, and inability to communicate effectively in English.</p>	<p>n = 409. 527 parents (264 control and 263 intervention). There was a significant difference between the intervention and control groups in the proportion of children who had one or more documented asthma-planning visits with their PCPs during the 15 days after the index ED visits. In the intervention group, 35.7% returned compared to 18.9% in the control group ($P < .0001$)</p>	Not reported.

Straus et al., 1982 USA	Urban-suburban. Annual number of ED presentations: 60,000	Quantitative Non-Randomised Study	Two cohorts: a concurrent cohort consisting of 398 patients enrolled prospectively from 1.10.79 31.12.1979, and a nonconcurrent cohort of 500 patients enrolled by reviewing all emergency room records. Inclusion criteria: Age not reported Diagnosis: not reported Time period: 1.11.77 to 31.12.1978, received care in the medical or paediatric non-urgent area of the ED, identified no regular primary care physician, resided in the Sinai Hospital catchment area, not admitted to the hospital for their presenting problem. Exclusion criteria: not reported	34 per cent of the concurrent patients complied with the referral. Appointment not made in ER 29% Vs appointment made in ED 70% ($p < .001$). Correlates of compliance were: age (very young and very old), patient-perceived health status, medically determined need for follow-up care, and having an appointment made by the emergency room provider ($p < .05$).	Not reported.
Vinker et al., 2004 Israel	Urban District medical centre care clinics and 12 primary care clinics (32 family practitioners)	Quantitative study Non-Randomised Study. Retrospective study.	n= 359 discharges Inclusion criteria: Age: 18 years +, Diagnosis: not reported Time: over one month visit to the general ED, discharged to the community (not hospitalized) at that visit, living and getting medical care in a family medicine group practice in the Rehovot region. Exclusion criteria: Visits due to accidents, trauma, surgery, orthopaedics, ENT, ophthalmology, and other specialities were excluded from the study.	Not reported.	The ED discharge letter was found in 50% (179/359) of the primary care files. A follow-up visit was documented in only 31% (111/359). Neither follow up visits nor discharge letters were found in 43% of the files (153/359). No associations between clinic characteristics (size, place) or family practitioner. <i>P</i> values not reported.

<p>Wang et al, 2006 USA</p>	<p>Urban University teaching hospital ED Annual ED presentations: 38,000.</p>	<p>Quantitative Descriptive Study. Prospective observational study.</p>	<p>Inclusion criteria: Age: 0-18 years Diagnosis: not reported Time: 1.7.2002 – 31.8.2002. Exclusion criteria: admitted to hospital or if their guardians were unavailable or unwilling to consent during the ED visit.</p>	<p>n = 336 subjects. Of these, 213 (63.4%) reported compliance with follow-up instructions, while 123 (36.6%) were noncompliant.</p>	<p>Using univariate analysis, being Hispanic, low household income, and insurance status were significantly associated ($p < 0.001$) The multivariable model demonstrated “insurance status” and “low acuity discharge diagnosis” be significantly associated with follow up noncompliance.</p>
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Watson et al., 2017 Australia	Suburban ED. Annual Number of ED presentations: not reported	Quantitative Descriptive Study. Prospective, descriptive study.	n = 50. Inclusion criteria: Age: 65 years +, Diagnosis: not reported Time: 2-week period in July 2016. Admitted to the ED during the recruitment weeks, subsequently discharged directly back into the community, sent with a discharge summary. Exclusion criteria: admitted as inpatients or transferred to another public health facility prior to discharge.	Most participants (76%) attended general practice follow-up by day seven. Those with more relatives who could be called on for help were more likely to attend the follow-up appointment (P = 0.003).	Participants were who were not married (54% versus 84%) and non-drivers (53% Versus 90%) were less likely to attend for follow-up. The participants in this study who had not seen a GP by day seven after discharge seemed more likely to have been female (33 Vs 10, P = 0.091), unmarried/widowed 46 vs 16, P + 0.055), did not drive, (34 Vs 10,P = 0.051) took more regular medications (6.4 medications Vs 4.1 medications, P = 0.02) and spent longer in the ED (256 mean minutes Vs 201 mean minutes, P = 0.076).
Winders et al., 2018 USA	Urban, Academic ED Annual ED presentations:70000	Quantitative Non-Randomised Studies. Observational study.	n = 90 patients. Inclusion criteria: Aged:18 years +, Diagnosis: HTN Time period: 1.4.2014 and 31.6.2014 ESI triage acuity of 3, 4, or 5, order to be discharged home from the ED, and had at least one phone number available in the medical records. Exclusion criteria: unable to provide informed consent or if they were unable to be contacted within the two to four weeks after their eligible ED visit.	Not reported.	77% of patients reported a previous diagnosis of hypertension, and 60% reported current treatment with antihypertensive medications. Five patients (5.5%) received written instructions at discharge addressing hypertension, although 59 (65.6%) reported that they were informed about their elevated blood pressure during the ED visit. Follow-up with a primary care provider within 2–4 weeks of discharge was completed in 57% of cases. <i>p</i> values not reported
Williams et al., 2013 USA	Urban	Quantitative study. Quasi-experimental: Retrospective chart review.	n = 216 charts Inclusion criteria: Age: Children	Asthma follow-up rates at 1 week improved from 20.8% to 50% after the intervention. After controlling for age and CAS with logistic regression, patients who received	Reasons for failed attendance at an asthma follow-up within 1 week.: Of the patients who did not follow up, 43% of their parents stated

	Tertiary care academic paediatric hospital Annual ED presentations: 24,000		Diagnosis: asthma Time: 1.1.2011 to 31.5.2012. Exclusion criteria: patients who listed their PCP as outside of the Medical University of South Carolina Health Care System, charts that did not document initial CAS on presentation to the ED.	the educational intervention were more likely to attend an outpatient asthma follow-up visit at 1 week compared with those who did not (P < .0001).	that they made an appointment for their child, but there were no available appointments within a week from ED discharge., 6% of parents made an asthma follow-up appointment within a week of ED discharge but were unable to keep the appointment., 29% of parents had not yet attempted to make an appointment. Of these, parental work was a commonly cited reason for why they had not yet made the appointment.,6% of parents stated that their child was no longer sick and did not need a follow-up appointment.
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Abbreviations: ACC After Care Clinic, ATS Australian Triage Score, AF Atrial fibrillation, CAD Coronary Artery Disease, CAS Clinical Asthma Score, CI Confidence Interval, COPD Chronic Obstructive Pulmonary Disease, CTAS Canadian Triage Assessment Score, ED Emergency Department, EMR Emergency Medical Record, EMU Emergency Medical Unit, EP Emergency Physicians, ESI Emergency Severity Index, FHN Family Health Network, FHT Family Health Team, FP Family Physicians, GP General Practitioner, HF Heart Failure, HTN Hypertension, hx History, ICD International Classification of Diseases, OR Odds Ratio, PED Pediatric emergency department, PCP Primary care provider, PHC Primary Health Care, RCT randomized control trial, RF Renal Failure, RR Risk Ratio, PCMH Patient Centered Medical Home, PCP Primary care physicians, UHMC United Hospitals' Medical Clinic.