Antimicrobial stewardship: a potential role for pharmacists in all settings.

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2024

Antimicrobial Stewardship

A potential role for pharmacists in all settings

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ESCP
European Society of Clinical Pharmacy

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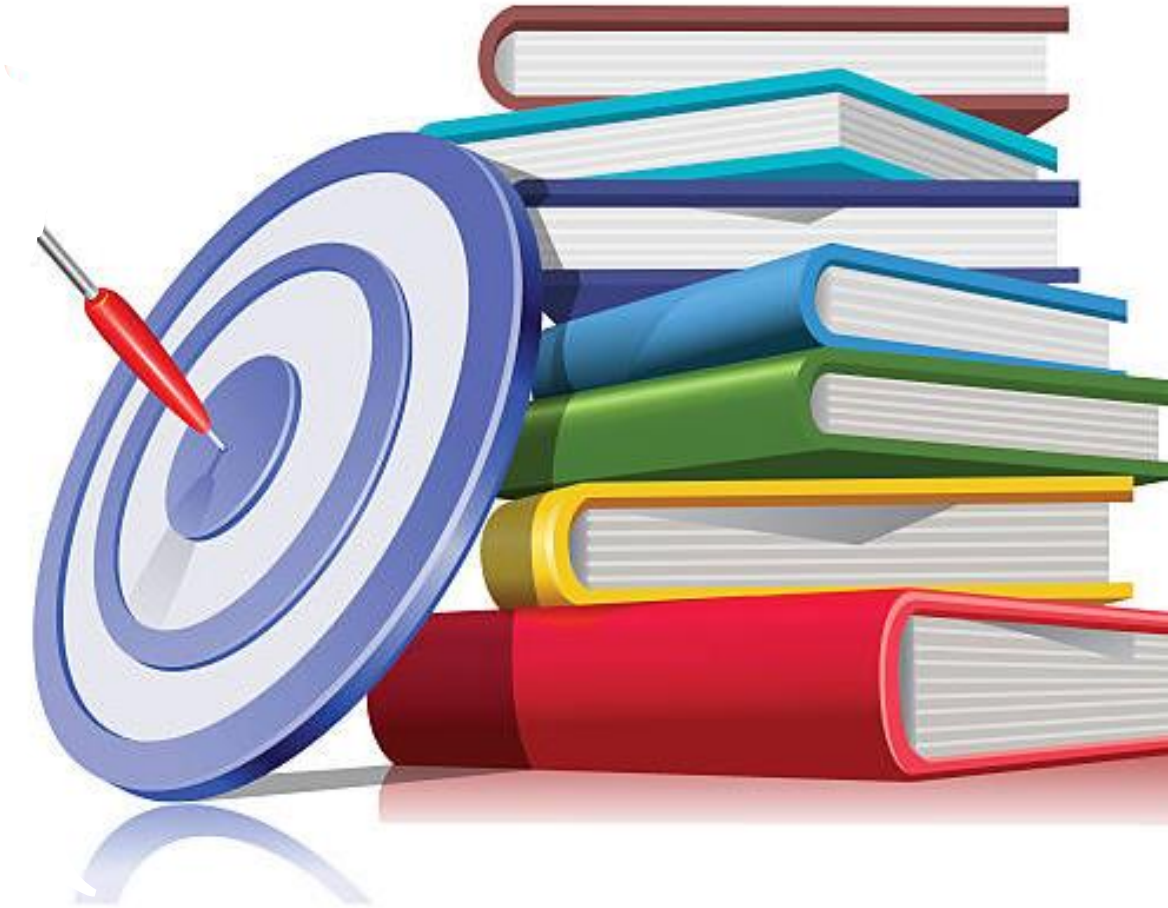
Learning Objectives

- To provide an overview of pharmacist practice settings within the UK
- To describe the potential scope of pharmacist involvement in antimicrobial stewardship in different practice settings (i.e. hospital, primary care and community pharmacy)
- To apply principles of antimicrobial stewardship to patient case scenarios presented



Where is RGU based?

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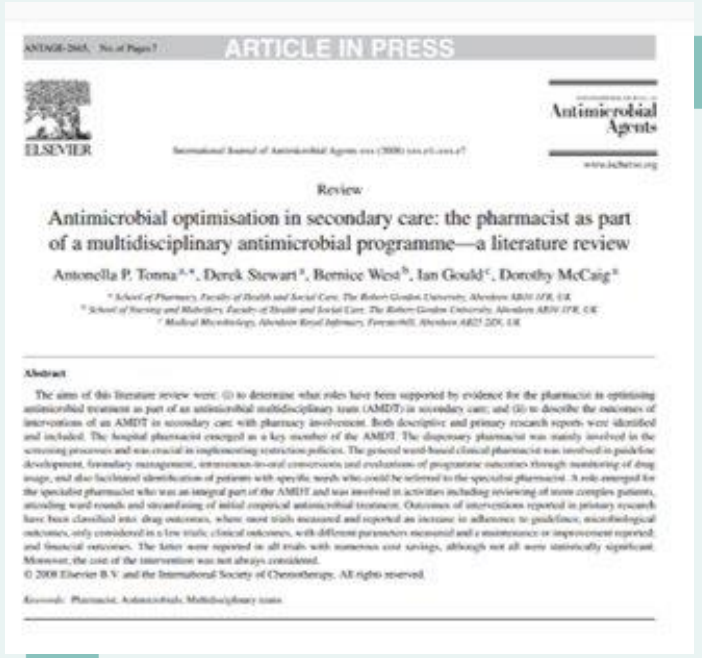
Where did my interest in AMS stem from?

- First hospital job in UK was in Oxford where I was a surgical admission and discharge pharmacist
- This is where interest in antimicrobials, antimicrobial prescribing and stewardship started to develop
- Particular issue with aspects such as vancomycin dosing
- Then moved on to start and complete a PhD … focused on hospital pharmacy only because that was my "comfort zone" and background

Where it all started in terms of research!



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ELSEVIER

Antimicrobial Agents

Review

Antimicrobial optimisation in secondary care: the pharmacist as part of a multidisciplinary antimicrobial programme—a literature review

Antonella P. Tonna[a,*], Derek Stewart[a], Bernice West[b], Ian Gould[c], Dorothy McCaig[a]

Abstract

The aims of this literature review were: (i) to determine what roles have been supported by evidence for the pharmacist in optimising antimicrobial treatment as part of an antimicrobial multidisciplinary team (AMDT) in secondary care; and (ii) to describe the outcomes of interventions of an AMDT in secondary care with pharmacy involvement. Both descriptive and primary research reports were identified and included. The hospital pharmacist emerged as a key member of the AMDT. The dispensary pharmacist was mainly involved in the screening processes and was crucial in implementing restriction policies. The general ward-based clinical pharmacist was involved in guideline development, formulary management, intravenous-to-oral conversions and evaluations of programme outcomes through monitoring of drug usage, and also facilitated identification of patients with specific needs who could be referred to the specialist pharmacist. A role emerged for the specialist pharmacist who was an integral part of the AMDT and was involved in activities including reviewing of more complex patients, attending ward rounds and streamlining of initial empirical antimicrobial treatment. Outcomes of interventions reported in primary research have been classified into drug outcomes, where most trials measured and reported an increase in adherence to guidelines; microbiological outcomes, only considered in a few trials; clinical outcomes, with different parameters measured and a maintenance or improvement reported; and financial outcomes. The latter were reported in all trials with numerous cost savings, although not all were statistically significant. Moreover, the cost of the intervention was not always considered.

Keywords: Pharmacist; Antimicrobials; Multidisciplinary team

UPP Pharmacy Practice

IJPP International Journal of Pharmacy Practice

Research Paper

Exploring pharmacists' perceptions of the feasibility and value of pharmacist prescribing of antimicrobials in secondary care in Scotland

Antonella P. Tonna[a], Derek C. Stewart[a], Bernice West[b] and Dorothy J. McCaig[a]

[a]School of Pharmacy and Life Sciences, Robert Gordon University and [b]Faculty of Health and Social Care, Robert Gordon University, Aberdeen, UK

Abstract

Objectives The introduction of non-medical prescribing in the UK has provided opportunities and challenges for pharmacists to help ensure prudent use of antimicrobials. The objective of this research was to explore pharmacists' perceptions of the feasibility and value of pharmacist prescribing of antimicrobials in secondary care in Scotland.

Methods Pharmacists' perceptions were explored using focus groups in five Scottish regions representing (a) urban and rural areas and (b) district general hospitals and large teaching centres. Senior hospital pharmacists, both prescribers and non-prescribers, working in specialities where antimicrobials are crucial to patient management, were invited to participate. A topic guide was developed to lead the discussions, which were audio-recorded and transcribed. The framework approach to data analysis was used.

Key findings Six focus groups took place and some emerging themes and issues are presented. Pharmacists believed that the feasibility of antimicrobial prescribing is dependent upon the patient's clinical condition and the area of clinical care. They identified potential roles and opportunities for pharmacist prescribing of antimicrobials. Perceived benefits included giving patients quicker access to medicines, reducing risk of resistance and better application of evidence-based medicine.

Conclusions Pharmacists feel they have a good knowledge base to prescribe and manage antimicrobial treatment, identifying possible opportunities for intervention. Roles within a multidisciplinary antimicrobial team need to be clearly defined.

Keywords antimicrobials; pharmacist independent prescribing; pharmacist supplementary prescribing; qualitative research; Scotland; secondary care

Exploring pharmacist prescribing in hospitals in Scotland, with a focus on antimicrobials.

Tonna, Antonella P.

Home / Outputs

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Abstract

This aim of the research was to explore pharmacist prescribing (PP) with a focus on antimicrobials, in hospitals in Scotland. A mixed-methods approach was used to collect, generate and synthesise data. A systematic review of peer-reviewed published literature on evidence-based roles for the pharmacist as part of an antimicrobial multidisciplinary team, identified roles for pharmacists within the teams but limited evidence relating to outcomes associated with these roles. Six qualitative focus groups, with 37 hospital pharmacists in 5 Scottish Health Boards, contextualised perceptions of barriers to, and facilitators of, implementation of PP in hospitals. Key themes were: perceived lack of pharmacy management support to take on a prescribing role and little strategic attention paid to PP implementation and sustainability. These issues were discussed in relation to PP in general and not only for antimicrobials. Participants perceived successful implementation of PP to be associated with factors including ward type and patients clinical condition. None of the pharmacists were prescribing antimicrobials and consequently further studies focused on PP in general. A scoping exercise, utilising various sources of information, reinforced findings from Phase 1; it highlighted the absence of any national or Health Board frameworks to support implementation of PP in secondary care in Scotland. Consensus-based research was undertaken, therefore, to provide guidance to facilitate service redesign involving PP in secondary care in Scotland. A Delphi approach undertaken with 40 experts, mainly in strategic posts, resulted in a high level of agreement in areas relating to succession planning, rather than role development; more variability was obtained in areas relating to future orientation of service, competencies required by prescribers and potential development of non-medical prescribing teams. The guidance was developed into a self-assessment toolkit providing an analytical strategy for implementation and role development of PP in secondary care. While the results and conclusions generated through this research need to be interpreted with caution, the data generated is an original contribution to the evidence base relating to PP.

Files

TONNA 2011 Exploring pharmacist prescribing
(2.7 Mb)
PDF
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Quick Poll

- How many participants work

  A) in hospital

  B) in community pharmacy

  C) in primary care (for example in a general practice surgery)

- Then are any participants involved in any antimicrobial stewardship activities other than provision of antibiotics?

  A) Yes

  B) No

Case scenario

A 34-year-old woman presents to the community pharmacy with what she believes is a Urinary Tract Infection. She complains of frequency of urination. On questioning, she has had these symptoms for the past 3 days but does not seem to have any other symptoms. She has already tried to drink cranberry juice regularly but there has been no improvement to her symptoms. She is asking for advice.

On further questioning, it is ruled out that she is pregnant. She has no co-morbidities and has only had these symptoms once in the past about 5 years ago and was given antibiotics by her GP.

She has two children under the age of 5 years, is a carer for her elderly parents, and she works in a busy supermarket. On discussing expectations with her, she finds the frequency of urination very disruptive particularly when she is on the shop floor and has come to the pharmacy expecting to be prescribed and dispensed antibiotics for a quick resolution of the symptoms.

How can the pharmacist react to this?

Is there a role in AMS here?

We will come back to this case later ...

An overview of pharmacist practice settings in the UK

Hospital Pharmacy

- Various Roles
- Dispensary
- Manufacture
- Clinical:
- General Ward Based
- Specialist Pharmacist in inpatient and outpatient setting

Primary Care

Newer role for pharmacists

Rapidly Expanding

- Pharmacist works in a patient facing role within a local community usually supporting general practitioners, nurses and other healthcare processionals
- May be involved in various activities including nursing/care home activities, run clinics usually relating to chronic conditions

Community Pharmacy

- Traditional pharmacist within a “shop”
- Offer various services including minor ailments, flu vaccination, travel clinics

Also need to keep in context that pharmacists in the UK can independently prescribe

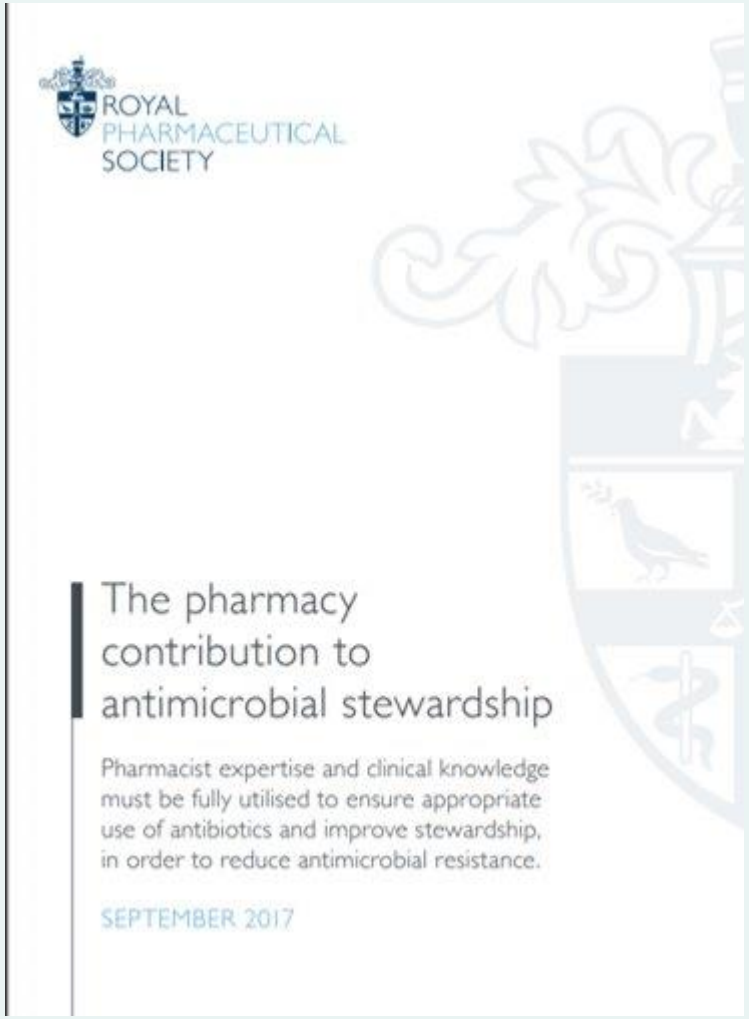
- Currently for pharmacists to be independent prescribers, they must be two years post registration, and complete an accredited pharmacist independent prescribing course.

- As from 2026, pharmacists will automatically be independent prescribers if they have completed an MPharm course following the 2021 requirements and have passed their registration exam.

- The long-term vision for pharmacy practice in the UK is for all registered pharmacists in the UK to be independent prescribers, whatever their practice setting

How are pharmacists involved in antimicrobial stewardship programmes in the UK?

Professional body for pharmacists in UK
Main driving force for pharmacist CPD requirements

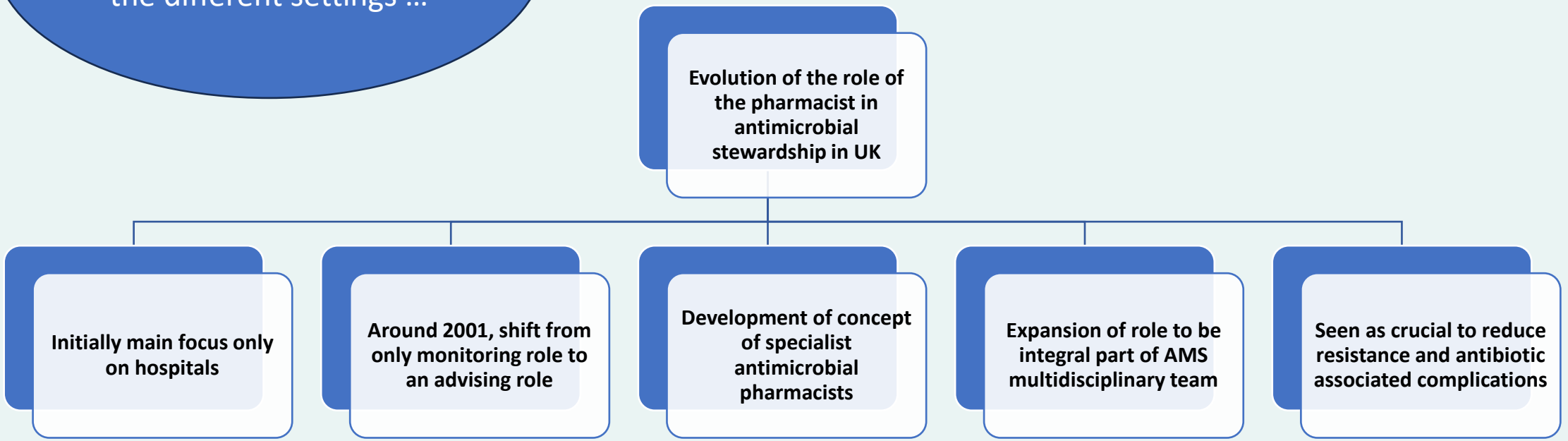


Makes key recommendations for pharmacy involvement in all settings

INTRODUCTION

This policy focuses on the pharmacist's role as part of a multidisciplinary approach in tackling the challenges of inappropriate use of antibiotics. The recommendations in this policy have been produced in order to contribute to wider efforts in meeting the challenge set by the UK Government in 2016 of reducing inappropriate antibiotic prescribing by 50% by 2020.[1] The policy, along with the RPS quick reference guide, (www.rpharms.com/AMS) aims to complement recommendations made by the Pharmaceutical Group of the European Union[2] (PGEU) and the International Pharmaceutical Federation[3] (FIP) in the global fight against Antimicrobial Resistance (AMR).

Expansion of pharmacist involvement in AMS in the different settings …



Some examples of activities in which **hospital pharmacists** are involved in relation to antimicrobial stewardship are provided.

Activities in hospital are likely to be part of a structured institution wide antimicrobial stewardship programme.

The level of activity depends largely on whether a general ward pharmacist, specialist antimicrobial pharmacist, aseptic pharmacist, dispensary pharmacist.

Specialist antimicrobial pharmacist likely to be involved in more complex activities and take on more leadership roles.

Patient evaluation

- Carried out mainly on the ward with advice tailored to speciality
- Interpretation of lab results available in conjunction with medical team
- Ensuring that prescribing carried out in accordance with local guidelines
- Maybe independently prescribing as appropriate
- Assessing patient whether they are suitable for OPAT if on long-term treatment

Choice of antimicrobial to prescribe

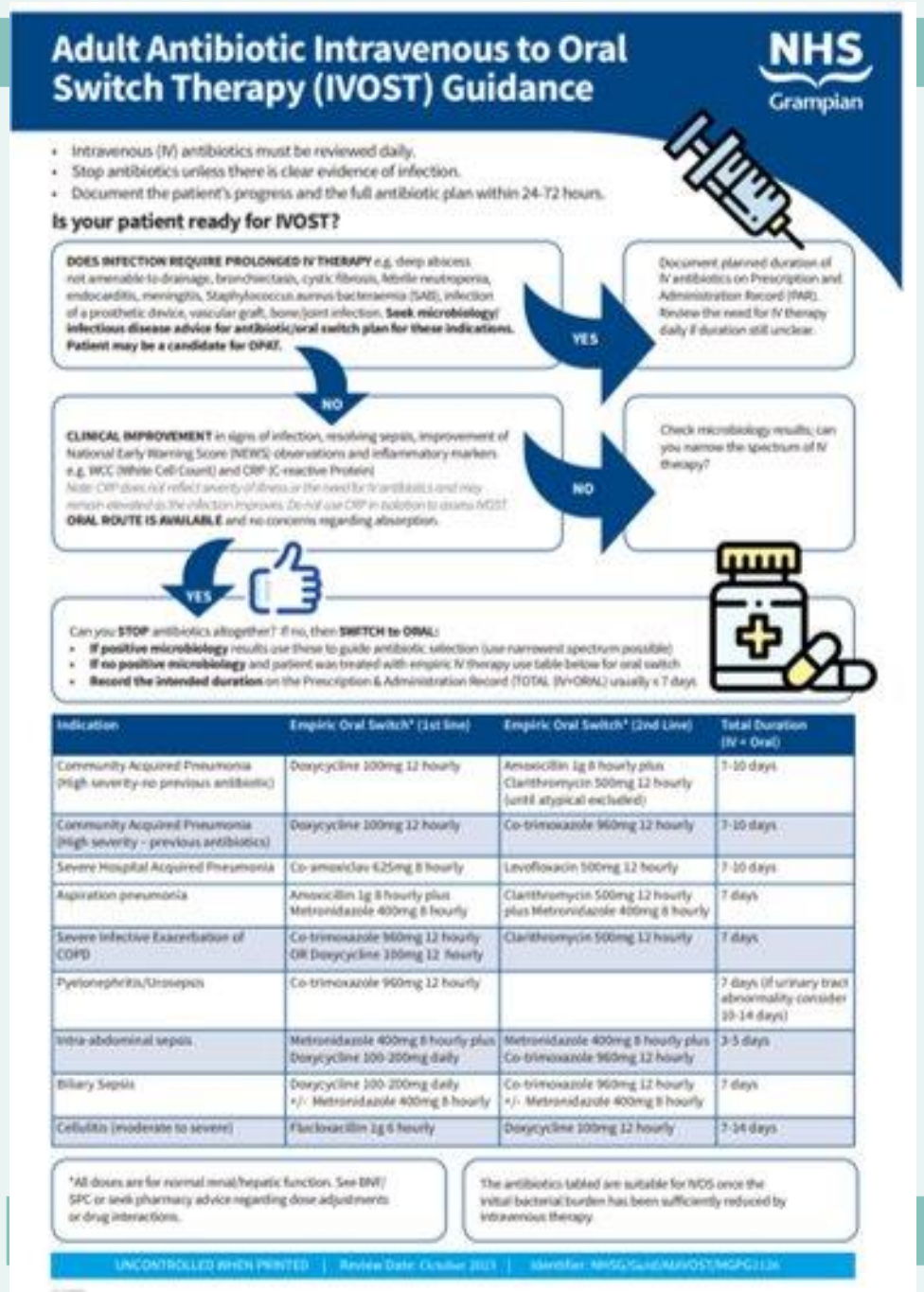
- Assess prescriptions for appropriateness and safety of antimicrobial – on ward or dispensary
- Attend ward rounds and provide advice
- Ensure prescribing carried out in accordance with local guidelines
- Education on use of restricted antibiotics if these are prescribed
- Monitoring and feedback on trends
- Involvement in point prevalence studies

Prescription ordering and dispensing

- Provision of supply following screening to ensure prescribing suitable for patient and in accordance with guidelines
- Provision of guidance on dosage, administration; potentially preparation
- Review antimicrobial duration – usually on ward

Optimization for individual patient

- Ensuring appropriate duration
- Pharmacokinetic monitoring and dosing adjustment
- IV-to-oral switch
- Monitor antimicrobial use relevant to other medications and relevant to patient progress
- Provision of patient counselling and advice



Adult Antibiotic Intravenous to Oral Switch Therapy (IVOST) Guidance

NHS Grampian

- Intravenous (IV) antibiotics must be reviewed daily.
- Stop antibiotics unless there is clear evidence of infection.
- Document the patient's progress and the full antibiotic plan within 24-72 hours.

Is your patient ready for IVOST?

DOES INFECTION REQUIRE PROLONGED IV THERAPY e.g. deep abscess not amenable to drainage, bronchiectasis, cystic fibrosis, febrile neutropenia, endocarditis, meningitis, Staphylococcus aureus bacteraemia (SAB), infection of a prosthetic device, vascular graft, bone/joint infection. **Seek microbiology/ infectious disease advice for antibiotic/oral switch plan for these indications. Patient may be a candidate for OPAT.**

YES → Document planned duration of IV antibiotics on Prescription and Administration Record (PAR). Review the need for IV therapy daily if duration still unclear.

NO

CLINICAL IMPROVEMENT in signs of infection, resolving sepsis, improvement of National Early Warning Score (NEWS) observations and inflammatory markers e.g. WCC (White Cell Count) and CRP (C-reactive Protein)
Note: CRP does not reflect severity of illness or the need for IV antibiotics and may remain elevated as the infection improves. Do not use CRP in isolation to assess IVOST.
ORAL ROUTE IS AVAILABLE and no concerns regarding absorption.

NO → Check microbiology results; can you narrow the spectrum of IV therapy?

YES

Can you **STOP** antibiotics altogether? If no, then **SWITCH to ORAL:**

- **If positive microbiology** results use these to guide antibiotic selection (use narrowest spectrum possible)
- **If no positive microbiology** and patient was treated with empiric IV therapy use table below for oral switch
- **Record the intended duration** on the Prescription & Administration Record (TOTAL (IV+ORAL) usually ≤ 7 days

Indication	Empiric Oral Switch* (1st line)	Empiric Oral Switch* (2nd Line)	Total Duration (IV + Oral)
Community Acquired Pneumonia (High severity-no previous antibiotic)	Doxycycline 100mg 12 hourly	Amoxicillin 1g 8 hourly plus Clarithromycin 500mg 12 hourly (until atypical excluded)	7-10 days
Community Acquired Pneumonia (High severity - previous antibiotics)	Doxycycline 100mg 12 hourly	Co-trimoxazole 960mg 12 hourly	7-10 days
Severe Hospital Acquired Pneumonia	Co-amoxiclav 625mg 8 hourly	Levofloxacin 500mg 12 hourly	7-10 days
Aspiration pneumonia	Amoxicillin 1g 8 hourly plus Metronidazole 400mg 8 hourly	Clarithromycin 500mg 12 hourly plus Metronidazole 400mg 8 hourly	7 days
Severe Infective Exacerbation of COPD	Co-trimoxazole 960mg 12 hourly OR Doxycycline 100mg 12 hourly	Clarithromycin 500mg 12 hourly	7 days
Pyelonephritis/Urosepsis	Co-trimoxazole 960mg 12 hourly		7 days (if urinary tract abnormality consider 10-14 days)
Intra-abdominal sepsis	Metronidazole 400mg 8 hourly plus Doxycycline 100-200mg daily	Metronidazole 400mg 8 hourly plus Co-trimoxazole 960mg 12 hourly	3-5 days
Biliary Sepsis	Doxycycline 100-200mg daily +/- Metronidazole 400mg 8 hourly	Co-trimoxazole 960mg 12 hourly +/- Metronidazole 400mg 8 hourly	7 days
Cellulitis (moderate to severe)	Flucloxacillin 1g 6 hourly	Doxycycline 100mg 12 hourly	7-14 days

*All doses are for normal renal/hepatic function. See BNF/ SPC or seek pharmacy advice regarding dose adjustments or drug interactions.

The antibiotics tabled are suitable for IVOS once the initial bacterial burden has been sufficiently reduced by intravenous therapy

UNCONTROLLED WHEN PRINTED | Review Date: October 2023 | Identifier: NHSG/SubD/AMS/IVOST/MGPG1126

Example of information provision at ward level as part of a healthboard wide AMS programme

Hospital specialist antimicrobial pharmacists are involved in both the design and the implementation of such guidance

DIAGNOSTIC STEWARDSHIP

Stewardship programmes are needed for both therapeutics and diagnostics.

Good diagnostic stewardship promotes appropriate, timely testing (including specimen collection, pathogen identification and antibiotic susceptibility, and audited reporting of results) to guide care. It discourages tests that are unnecessary or that can yield misleading results; and it uses microbiological data to inform local treatment guidelines and AMR control strategies.

These include, for example, the identification and categorisation of essential antibiotics using the WHO's 'AWaRe' index (see Figure 4).

The NHS' increasing deployment of clinical pharmacists working in primary care, including within care homes and GP practices, offers new opportunities for enhancing antimicrobial stewardship through knowledge exchange and learning.

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These pharmacists also represent a key link to primary care pharmacists, who have a critical role in reviewing prescriptions for antimicrobials and challenging those that may be inappropriate. The rise in electronic prescribing in secondary care additionally presents opportunities to support stewardship, as a source of data for healthcare providers to track prescribing rates and guidance compliance, and potentially link prescribing activity to outcomes through linked datasets.

HM Government

Tackling antimicrobial resistance 2019–2024

The UK's five-year national action plan

Published 24 January 2019

To strengthen stewardship programmes, the UK will:

- Develop a patient-level prescribing and resistance data source (including health and infection outcome and impact data) with timely access at point of care to support clinical decision making along with access to NICE guidance.
- Enhance the role of pharmacists in primary care to review the dose and duration of antimicrobial prescriptions (especially long-term or repeat ones) and work with prescribers to review those that are inappropriate through evidence-based, system-wide interventions.
- Raise public awareness to encourage self-care and reduce expectations of antibiotics.

Expansion of role in key government strategic documents: defined role for pharmacists in primary care settings – i.e. care homes and GP practices

Some examples of activities primary care pharmacists may be involved in relating to AMS

Patient management

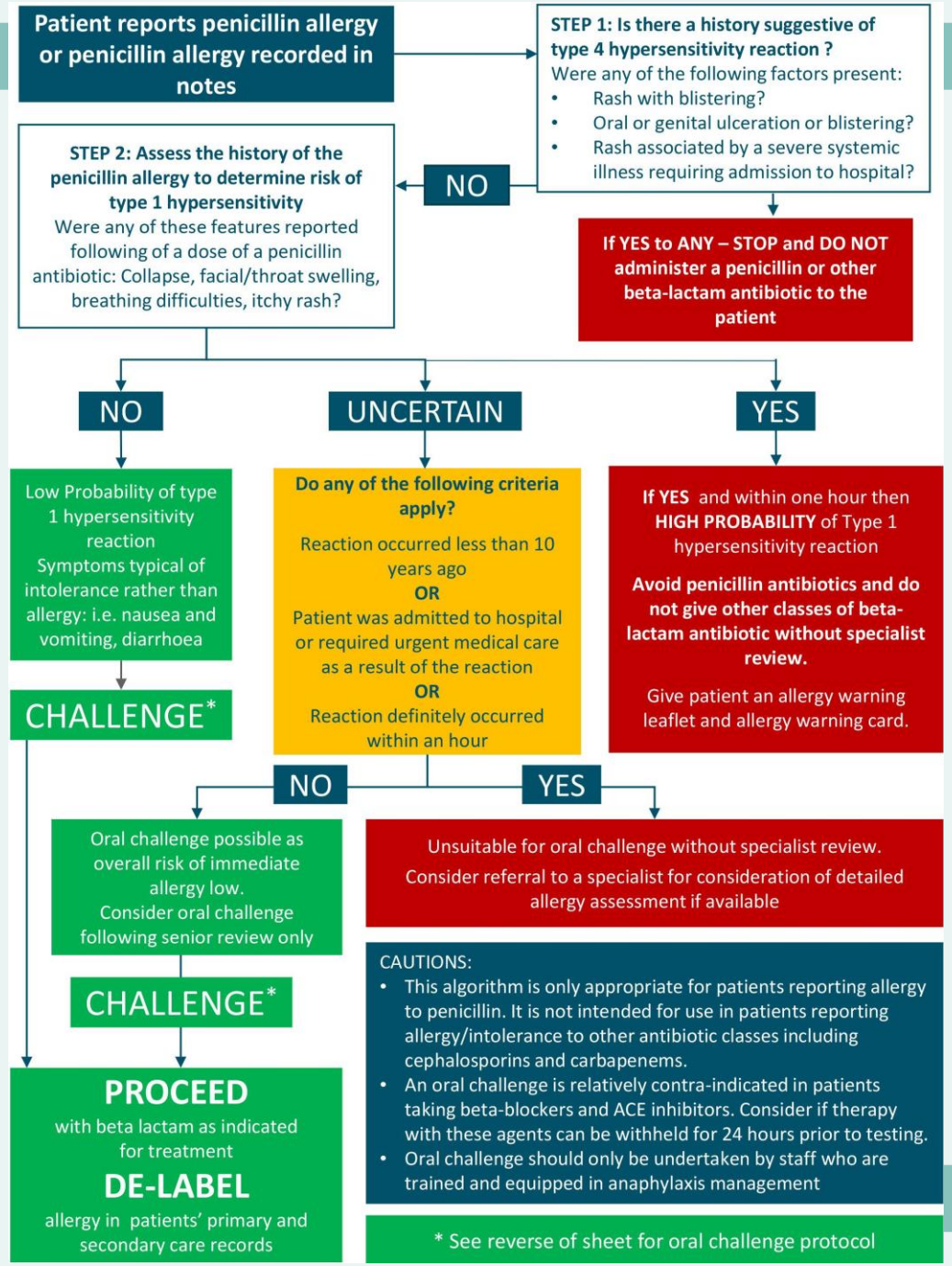
- Independent prescribing potentially more of a role in primary care with pharmacist working within the community team.
- Management of simple, common infections such as Urinary Tract Infections
- Lack of GPs ensures that patients have access to rapid access
- Provision of advice to patients on self-care should no antibiotic treatment be required

Provision of advice

- Advising GP team on evidence-based practice
- Undertaking audits and provision of feedback
- Development of local regional formularies based on local culture and sensitivities

Optimization for individual patient

- Ensuring appropriate duration
- Provision of patient counselling and advice
- Ensuring patient electronic records are up-to-date e.g. drug allergies appropriately recording
- Current national programme – penicillin de-labelling in conjunction with secondary care



Example of protocol of a national de-labelling programme

Carrying on with UTI theme …

Improving antibiotic prescribing for uncomplicated UTIs

ORIGINAL RESEARCH Parallel, cluster randomised controlled trial

Effect of a multimodal intervention in primary care to reduce second line antibiotic prescriptions for urinary tract infections in women

Schmiemann G, Greser A, Maun A, et al

Cite this as: *BMJ* 2023;383:e076305
Find this at doi: 10.1136/bmj-2023-076305

Study question Does a multimodal intervention that includes regional resistance data and feedback on individual prescribing behaviour reduce rates of prescribing second line antibiotics for urinary tract infections (UTIs) in women?

Methods This parallel, cluster randomised controlled trial took place in 128 general practices in five regions of Germany. Data were collected between 1 April 2021 and 31 March 2022. The primary outcome was the proportion of second line antibiotics prescribed, in relation to all antibiotics prescribed, for uncomplicated UTIs after one year between the intervention and control groups. General practices were randomly assigned (1:1). In the intervention group, general practitioners were informed of current guideline recommendations, received regional data on antibiotic resistance for the most common uropathogens and individual quarterly feedback on their prescription rates of first and second line antibiotics for women with uncomplicated UTIs, were benchmarked with regional or supra-regional practices, and had telephone counselling to discuss further questions. Participants in the control group received no information on the intervention. According to national guidelines, second line drugs were defined as all antibiotics other than trimethoprim, pivmecillinam, nitrofurantoin, fosfomycin, or nitroxoline, which are first line treatments. The secondary outcome was the proportion of all antibiotic prescriptions, relative within all cases (instances of UTI diagnosis), for the treatment of UTIs after one year between the groups. Adverse events were assessed as exploratory outcomes. Other exploratory outcomes were the proportion of high and low prescribers, the changes of prescribing behaviour over time, and factors associated with low performance (defined as >10% of second line antibiotic prescriptions).

Study answer and limitations Between 1 April 2021 and 31 March 2022, 110 practices (n=57 intervention, n=53 control) with full datasets identified 10 323 people with UTIs during five quarters (ie, 15 months). Mean preintervention prescription proportions for second line antibiotics in relation to all antibiotics for the treatment of UTIs were 0.27 (standard deviation (SD) 0.29) in the intervention group and

"In the intervention group, general practitioners were informed of current guideline recommendations, received regional data on antibiotic resistance for the most common uropathogens and individual quarterly feedback on their prescription rates of first and second line antibiotics for women with uncomplicated UTIs …"

Interventions resulted in changes in prescribing patterns with significantly less second line agents prescribed; prescribed significantly less antibiotics for UTIs; benefits of intervention sustained after a year.

Great potential role for primary care pharmacists

Community pharmacy setting …
Interventions may/may not be as part of an organised AMS programme but are mainly opportunistic

Patient management

- Providing “over-the-counter” preparations if/when appropriate
- Involvement in vaccination campaigns
- Prescribing and providing antibiotics for simple infections – for example trimethoprim for uncomplicated UTIs in females
- Referring only to the GP with an expectation for antibiotic to be prescribed following review

Provision of advice

- Education, advice and support to patients particularly on aspects of self-care when viral infection most likely
- Identifying red flag symptoms that required referral for medical review
- Delivering public health campaigns – for example EAAD
- Provision of advice if patients have recurrent infections – e.g. recurrent UTIs, chest infections, vaccination advice for those with infections such as COPD

Optimization for individual patient

- Potentially provision of near-patient-testing for detection of bacterial infection – still as a pilot project

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Point of care testing in community pharmacies

Guidance for commissioners and community pharmacies delivering NHS services

Version 1, January 2022

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Diagnostics

04 May 2016

By Michael Wakeman, Tania Cork & David Watwood

Corresponding author
Michael Wakeman

Point-of-care C-reactive protein testing in community pharmacy to deliver appropriate interventions in respiratory tract infections

Abstract

O'Neill K, Fleming G, Scott M, Plant G, Varma S. C-reactive protein point of care testing in community pharmacy: Observational study of a Northern Ireland pilot. Pharmacy Practice 2022 Oct-Dec:20(4):2711.
https://doi.org/10.18549/PharmPract.2022.4.2711

Original Research

C-reactive protein point of care testing in community pharmacy: Observational study of a Northern Ireland pilot

Katherine O'Neill, Glenda Fleming, Michael Scott, Gillian Plant, Sumanthra Varma

Received (first version): 14-Jul-2022 Accepted: 05-Sep-2022 Published online: 10-Oct-2022

Abstract

Background: Whether or not to prescribe an antibiotic is a key issue for clinicians treating respiratory tract infection (RTI) in the community. Measurement of C-reactive protein (CRP) in community pharmacy may help to differentiate viral and self-limiting infections from more serious bacterial infections. **Objective:** To pilot POC CRP testing for suspected RTI within community pharmacy in Northern Ireland (NI). **Methods:** POC CRP testing was piloted in 17 community pharmacies linked to 9 general practitioner (GP) practices in NI. The service was available to adults presenting to their community pharmacy with signs and symptoms of RTI. The pilot (between October 2019 and March 2020) was stopped early due to Coronavirus-19 (COVID-19). **Results:** During the pilot period, 328 patients from 9 GP practices completed a consultation. The majority (80%) were referred to the pharmacy from their GP and presented with <3 symptoms (55%) which had a duration of up to 1 week (36%). Most patients (72%) had a CRP result of <20mg/L. A larger proportion of patients with a CRP test result between 20mg/L and 100mg/L and >100mg/L were referred to the GP when compared to patients with a CRP test result of <20mg/L. Antimicrobial prescribing rates were studied in a subgroup (n=30) from 1 practice. Whilst the majority (22/30; 73%) had a CRP test result of <20mg/L, 50% (15/30) of patients had contact with the GP in relation to their acute cough and 43% (13/30) had an antibiotic prescribed within 5 days. The stakeholder and patient survey reported positive experiences. **Conclusion:** This pilot was successful in introducing POC CRP testing in keeping with National Institute of Health and Care Excellence (NICE) recommendations for the assessment of non-pneumonic lower RTIs and both stakeholders and patients reported positive experiences. A larger proportion of patients with a possible or likely bacterial infection as measured by CRP were referred to the GP, compared to patients with a normal CRP test result. Although stopped early due to COVID-19, the outcomes provide an insight and learning for the implementation, scale up and optimisation of POC CRP testing in community pharmacy in NI.

Keywords: point of care testing; c-reactive protein; community pharmacy; Northern Ireland

Healthier Scotland
Scottish Government

NHS SCOTLAND

Taking ANTIBIOTICS when you don't need them puts you and your family at risk

ANTIBIOTICS DON'T WORK FOR

- Colds
- Flu
- Coronavirus (COVID-19)
- Viruses
- Vomiting
- Most coughs
- Most ear infections
- Most sore throats
- Most diarrhoea
- Most cystitis

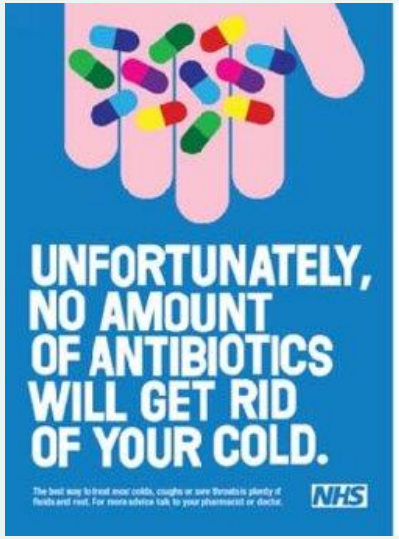
TAKE YOUR PHARMACIST'S ADVICE

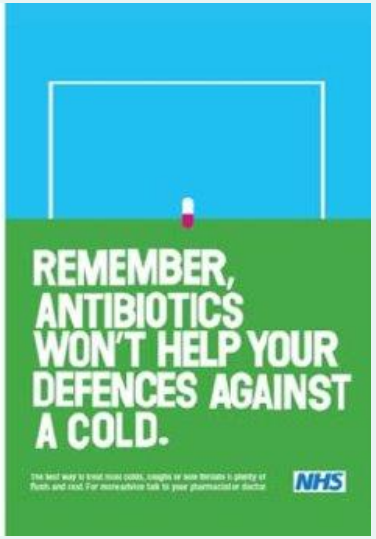
ANTIBIOTICS ARE NEEDED FOR

- Serious bacterial infections including:
- Sepsis
- Pneumonia
- Urinary tract infections
- Sexually transmitted infections like gonorrhoea
- Meningococcal meningitis

TAKE YOUR DOCTOR'S ADVICE

Keep Antibiotics Working





Time for you to think …

Case scenario

A 34-year-old woman presents to the community pharmacy with what she believes is a Urinary Tract Infection. She complains of frequency of urination. On questioning, she has had these symptoms for the past 3 days but does not seem to have any other symptoms. She has already tried to drink cranberry juice regularly but there has been no improvement to her symptoms. She is asking for advice.

On further questioning, it is ruled out that she is pregnant. She has no co-morbidities and has only had these symptoms once in the past about 5 years ago and was given antibiotics by her GP.

She has two children under the age of 5 years, is a carer for her elderly parents, and she works in a busy supermarket. On discussing expectations with her, she finds the frequency of urination very disruptive particularly when she is on the shop floor and has come to the pharmacy expecting to be prescribed and dispensed antibiotics for a quick resolution of the symptoms.

Discussion

- What are the signs and symptoms of UTI in this patient?
- Would this classify as a complicated or uncomplicated UTI? Why?
- Is there a strong evidence base to support the use of cranberry juice in UTI’s?
- What is the likely causative organism of this UTI?
- What are the patient’s expectations? Are these likely to conflict with what is required by this patient?

- Only one symptom – frequency of urination
- The fact that female, one symptom, not pregnant, no co-morbidities points at uncomplicated UTI

The following classification of UTIs is adopted in the EAU Urological Infections Guidelines:

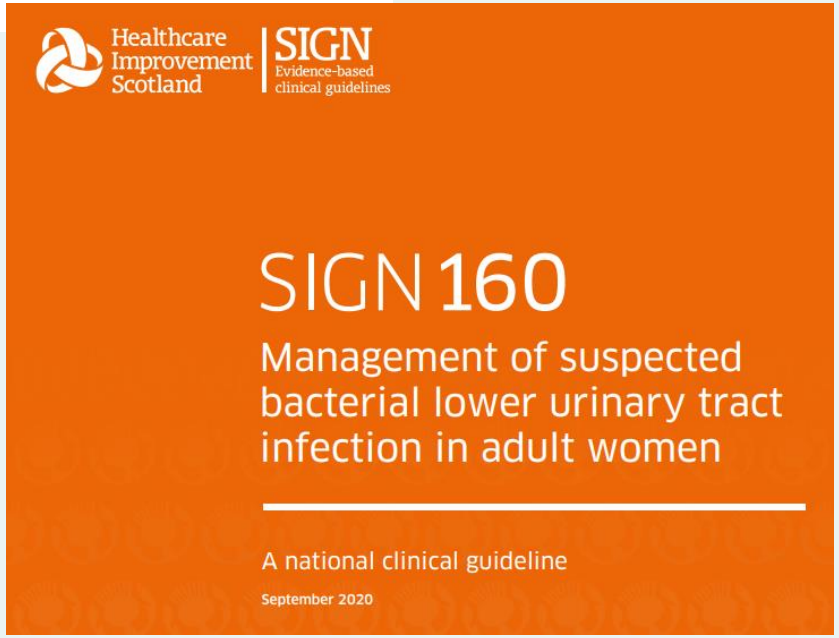
Classification of UTI	
Uncomplicated UTIs	Acute, sporadic or recurrent lower (uncomplicated cystitis) and/or upper (uncomplicated pyelonephritis) UTI, limited to non-pregnant women with no known relevant anatomical and functional abnormalities within the urinary tract or comorbidities.
Complicated UTIs	All UTIs which are not defined as uncomplicated. Meaning in a narrower sense UTIs in a patient with an increased chance of a complicated course: i.e. all men, pregnant women, patients with relevant anatomical or functional abnormalities of the urinary tract, indwelling urinary catheters, renal diseases, and/or with other concomitant immunocompromising diseases for example, diabetes.
Recurrent UTIs	Recurrences of uncomplicated and/or complicated UTIs, with a frequency of at least three UTIs/year or two UTIs in the last six months.
Catheter-associated UTIs	Catheter-associated urinary tract infection (CA-UTI) refers to UTIs occurring in a person whose urinary tract is currently catheterised or has had a catheter in place within the past 48 hours.
Urosepsis	Urosepsis is defined as life threatening organ dysfunction caused by a dysregulated host response to infection originating from the urinary tract and/or male genital organs [12].

European Association of Urology

https://uroweb.org/guidelines/urological-infections/chapter/the-guideline

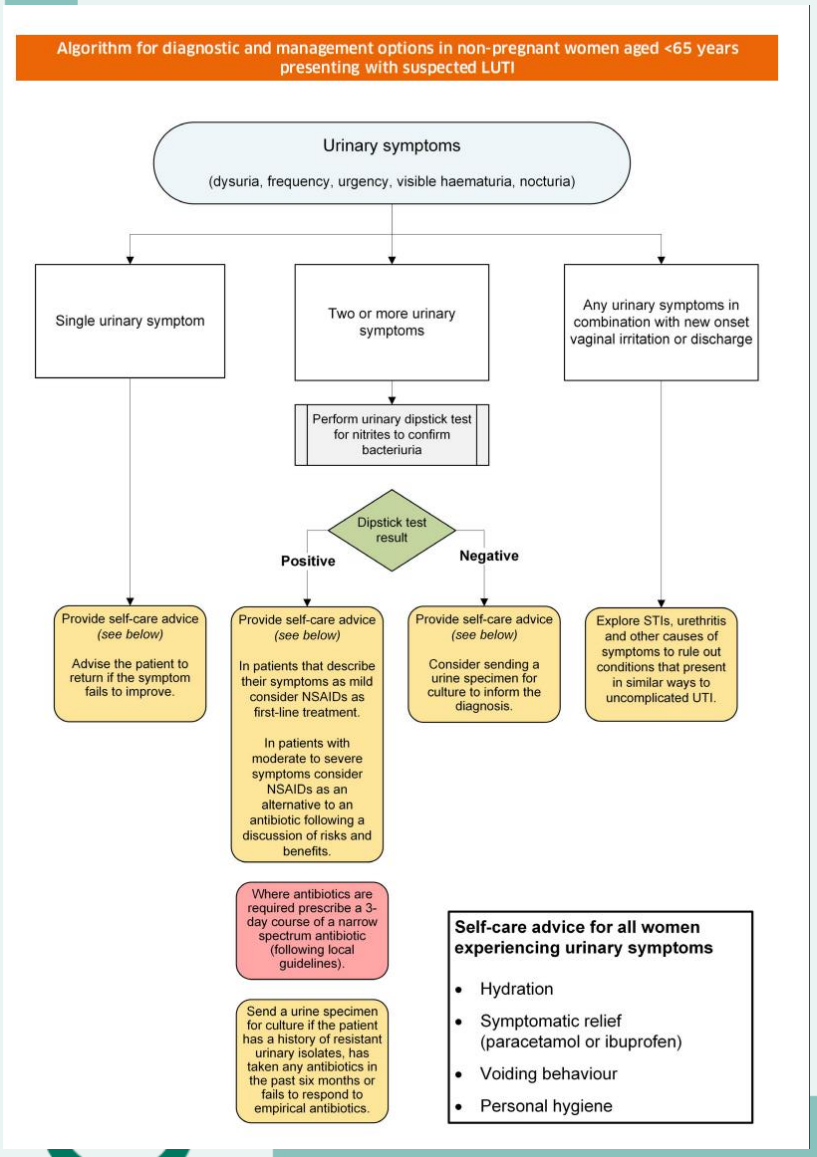
- Evidence for use of cranberry juice – not strong

> Evidence for the effectiveness of cranberry products in preventing UTI is conflicting. Three systematic reviews and the body of evidence which these include report inconsistent results on the incidence of new UTIs across a range of populations.[111-113]



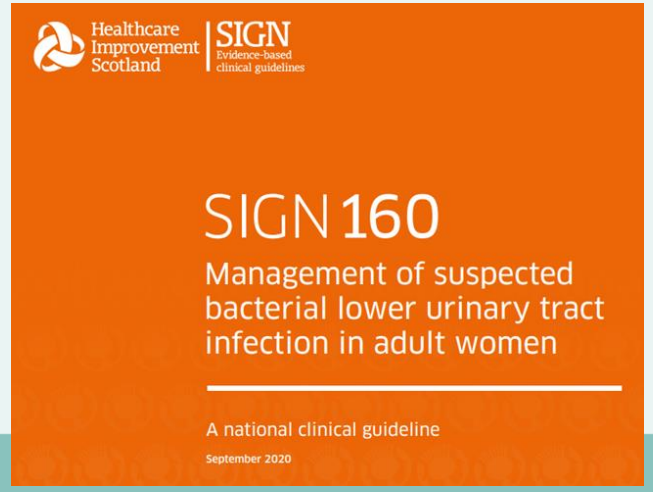
- *Escherichia Coli*
- Patient demands and previous experience raise her expectations that an antibiotic is will be recommended

What is the best course of action in this patient?



The expectations and preferences of the patient are different since the patient is not a candidate for antibiotics but is expecting to be prescribed antibiotics.

A need to discuss the benefits and risks of prescribing antibiotics to the patient – there is no real benefit in prescribing antibiotics for her if the risk of side effects is higher than any benefit that she may have. This may be difficult for the patient to understand and may require some negotiation on the part of the pharmacist.



Case Scenario

Mrs IT is a 60 year old woman who attends the GP practice and is reviewed by the practice pharmacist.

She is a smoker and complains of a 4 day history of fever and a productive cough which is yellow and thick.

Her respiratory rate is 16 breaths/min.

Her blood pressure is 122/78 mmHg.

The practice pharmacist suspects a pneumonia.

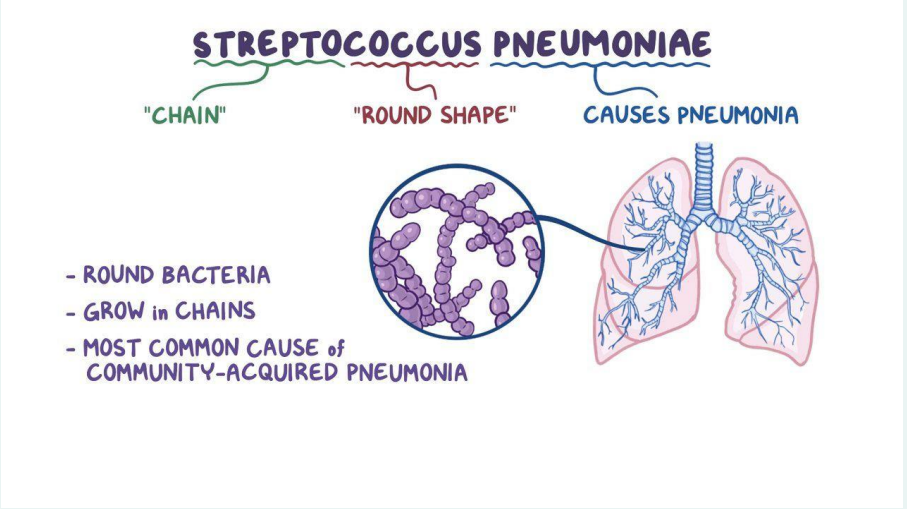
Discussion

- What do you understand by “community acquired” and “healthcare acquired” pneumonia? Which type of pneumonia is our patient likely to have?

- What is the likely causative organism?

Type of pneumonia

- “Community acquired” – pneumonia (CAP) acquired outside a healthcare institution
- “Healthcare acquired” – acquired within an institution such as a hospital or care home (also referred to as hospital acquired; nosocomial)
- Management of the two is different so it is important to determine which type of pneumonia is being managed



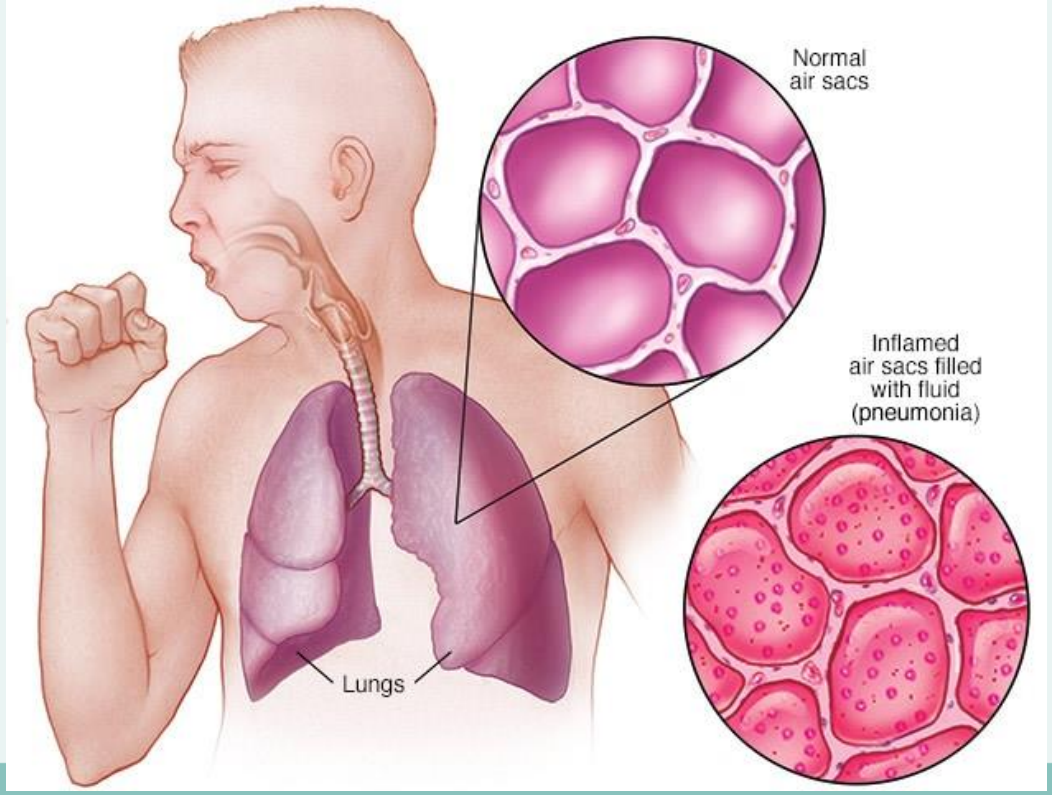
Organism

- *Streptococcus pneumoniae* (~30%)
- *Haemophilus influenzae* (~10% and maybe associated with previous viral infection)
- *Mycoplasma pneumoniae* (~10% - atypical organism – usually in younger patients)

Discussion

- What are the signs and symptoms of a chest infection in Mrs IT ?

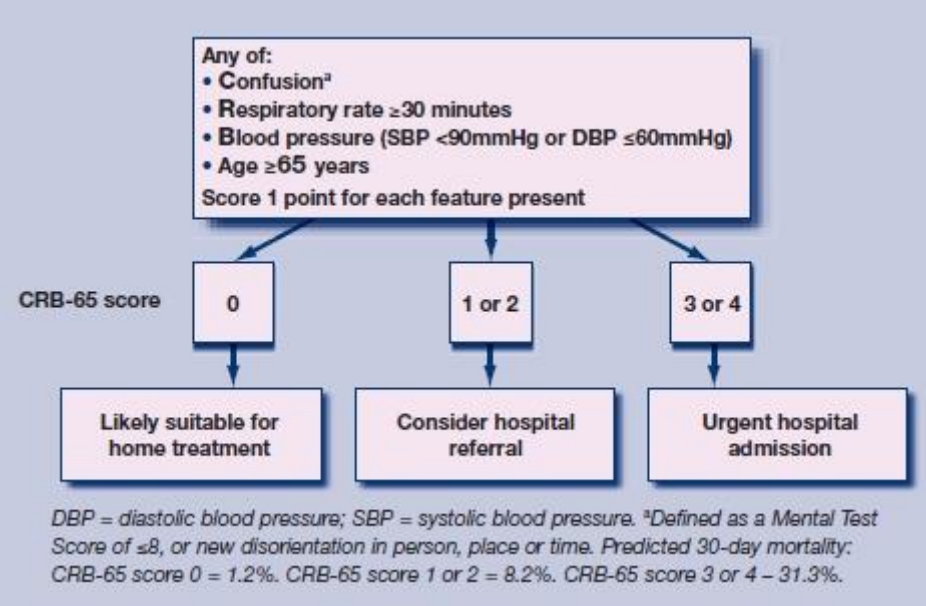
- How can we determine the severity of the CAP in Mrs IT?

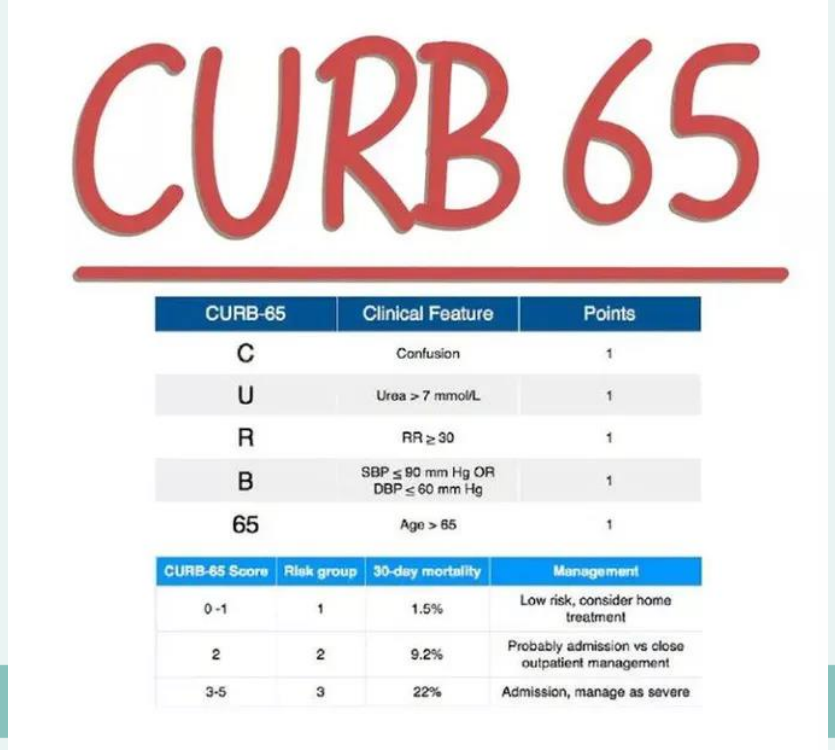


Signs and symptoms

- Fever
- Productive cough
- Confusion
- Smoking needs to be considered as a risk factor for development of pneumonia

Severity of infection

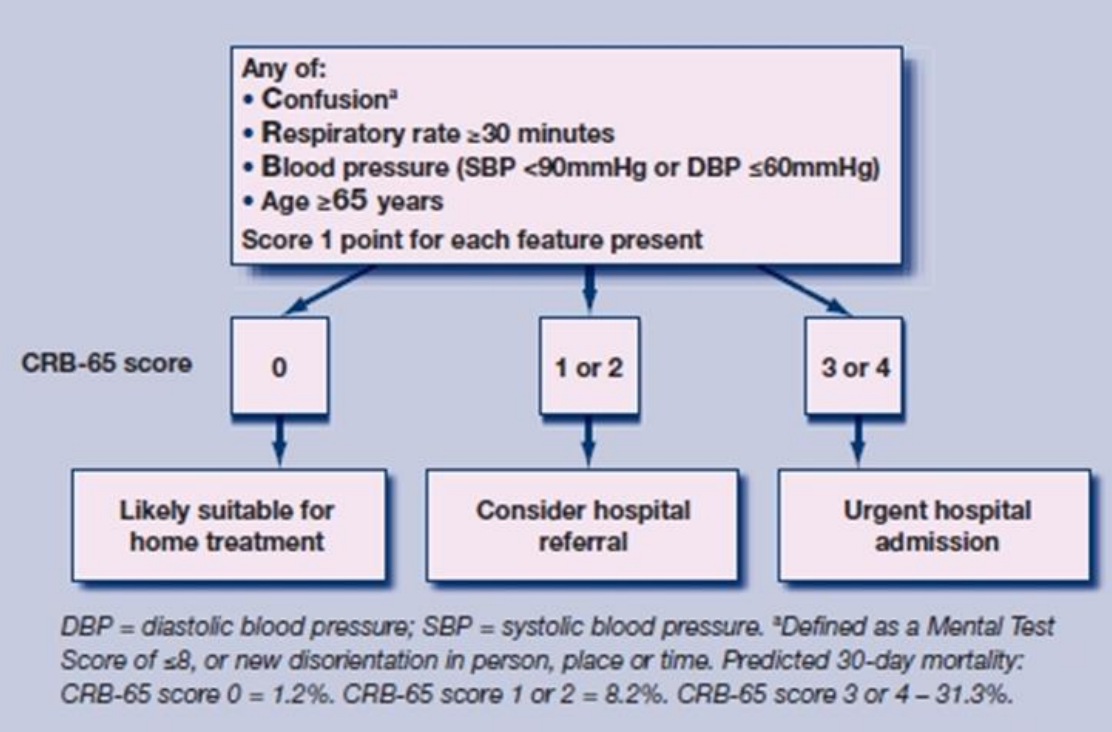




Discussion

- What is a possible course of action?
- What is important to discuss with this patient?

Suggested management of this patient



Mrs IT is likely to be suitable for home treatment

She will require antibiotic treatment. How do we select this?

We need to refer to our local or national guidelines for empirical treatment of infection

What other important piece of information do we need before making a choice?

Important to discuss smoking cessation

Guidance for initial hospital therapy in adults. Specialist units may have separate policies

Empirical Antimicrobial Therapy Prescribing Guidance for Adults

NHS Grampian

STOP AND THINK BEFORE YOU GIVE ANTIBIOTIC THERAPY! Antibiotics are overused in the elderly (particularly patients with urinary catheters or suspected UTIs) and in patients with viral or non-infective exacerbations of COPD. Always obtain cultures and consider delay in therapy unless there is a clear anatomical site of infection with high probability of bacterial aetiology, sepsis or clinical deterioration. Check previous microbiology results. Doses quoted are for patients without renal or hepatic impairment, please adjust if necessary. Consider cautions, contra-indications and drug interactions.

ORAL THERAPY USUALLY RECOMMENDED

Lower Respiratory Tract

Pneumonia

CURB65 score:
Confusion (new onset), Urea >7, RR>30, diast BP<60
or syst BP<90, age ≥65yrs.
Additional adverse features: hypoxia (SAO2 <92%) or multilobar consolidation or cavitation on x-ray.

Low Severity Community Acquired Pneumonia (CAP)

CURB65 score: 0-1
Oral **Amoxicillin** 1g 8hrly
or
Oral **Doxycycline** 200mg stat then 100mg daily.
Duration 5 days – consider extending if symptoms not improved after 3 days.

Moderate Severity CAP

CURB65 score: = 2
Oral/IV **Amoxicillin** 1g 8hrly
+ oral **Clarithromycin** 500mg 12hrly (until atypical excluded)
If true penicillin allergy
oral **Doxycycline** monotherapy 100mg 12 hrly
or if IV required, treat as per CURB65 ≥3
Total duration 5-7 days – consider extending if symptoms not improved after 3 days.

Lower Respiratory Tract Infection (LRTI) – define diagnosis (e.g. acute bronchitis, exacerbation COPD, CAP) and treat accordingly

Exacerbation of COPD

Antibiotics only if purulent sputum and raised WCC or CRP. Use 1st line antibiotic unless recent hospitalisation or recent antibiotic.

Mild to Moderate Severity

Oral **Amoxicillin** 1g 8hrly

If true penicillin allergy
Doxycyline 200mg stat then 100mg daily.

Duration 5 days.

Severe Infective Exacerbation of COPD

Co-trimoxazole 960mg IV# 12hrly
Switch to oral

Urinary Tract

Lower UTI/cystitis – female

Antibiotics if symptoms + positive urinalysis. Consider delaying antibiotic therapy pending urine culture.
Catheter specimen of urine is unreliable.
Caution with these antibiotics in patients with CKD ≥3 or at risk of hyperkalaemia.

Trimethoprim 200mg 12hrly
or
Nitrofurantoin 100mg m/r 12hrly or 50mg i/r 6hrly

Duration 3 days.

Uncomplicated UTI - men

As above duration 7 days.

UTI in Pregnancy

Nitrofurantoin 100mg m/r 12hrly or 50mg i/r 6hrly (Avoid in 3rd trimester)
or
Trimethoprim 200mg 12hrly (Avoid in 1st trimester)
If 1st line options unsuitable

Gastro-Intestinal

Gastroenteritis

No antibiotic usually required.

***Clostridium difficile* associated diarrhoea**

Stop/simplify concomitant antibiotics and gastric acid suppressive therapy if possible.

Refer to full guidance for list of severity factors.

Non-severe: oral **Metronidazole** 400mg 8hrly
Severe or no improvement after 5 days of **Metronidazole**; **oral Vancomycin** 125mg 6hrly (add IV **Metronidazole** 500mg 8hrly if ileus or hypotension)

Total duration 10 days.

Recurrent CDI – discuss with microbiology / ID

Skin/Soft Tissue

Limited soft tissue infection

Oral **Flucloxacillin** 1g 6hrly
If true penicillin allergy
Oral **Clarithromycin** 500mg 12hrly

Duration 7 - 14 days.

Infected bite
Human or animal bite
Oral **Co-amoxiclav** 625mg 8hrly

Second line or in penicillin allergy
Oral **Doxycycline** 100mg 12hrly
+**Metronidazole** 400mg 8hrly

Duration 7 days

Diabetic Foot Infection

Refer to protocol on **Diabetes Grampian Guidance** intranet page.

Intra-abdominal Sepsis

Gentamicin** IV
+ **Metronidazole** 500mg 8hrly

Moderate to severe cellulitis

Flucloxacillin 1-2g 6hrly IV
(use 2g if BMI>30)

IMPORTANT NOTES

REVIEW ANTIBIOTIC THERAPY DAILY:

- STOP?
- SIMPLIFY?
- SWITCH?
- DOCUMENT!

GUIDANCE ICONS

**	**Gentamicin/Vancomycin** - see prescribing guidance on intranet
§	**Aztreonam** If eGFR < 30mL/min (CKD>4) or known/ suspected AKI consider aztreonam IV as alternative to gentamicin – see dosing information on intranet
#	If **IV Co-trimoxazole** not available - see full guideline for advice

Clostridium difficile infection (CDI) risk.

Use the following antibiotics with **caution** in high risk patients e.g. frail elderly, immunosupressed, prolonged hospital stay, previous CDI, recent antibiotics.

High risk antibiotics: clindamycin, ceftriaxone, ceftazidime, ciprofloxacin, levofloxacin, co-amoxiclav, clarithromycin, meropenem.

URGENT IV THERAPY

Sepsis - Source Unknown | CNS Infection | Endocarditis

Pneumonia (community-acquired): antimicrobial prescribing

NICE National Institute for Health and Care Excellence

Choice of ~~antibiotic~~: adults aged 18 years and over

Antibiotic[1]	Dosage and course length
First choice oral antibiotic if low severity (based on clinical judgement and guided by CRB65 score 0 or CURB65 score 0 or 1 when calculated)[2]	
Amoxicillin	500 mg three times a day (higher doses can be used - see BNF) for 5 days[3]
Alternative oral antibiotics if low severity, for penicillin allergy or if amoxicillin unsuitable (for example, atypical pathogens suspected6)[2]	
Doxycycline	200 mg on first day, then 100 mg once a day for 4 days (5-day course in total)[3]
Clarithromycin	500 mg twice a day for 5 days[3]
Erythromycin (in pregnancy)[4]	500 mg four times a day for 5 days[3]
First choice oral antibiotics if moderate severity (based on clinical judgement and guided by CRB65 score 1 or 2, or CURB65 score 2 when calculated); guided by microbiological results when available[2]	
Amoxicillin ***with (if atypical pathogens suspected[5]):***	~~500 mg three times a day (higher doses can be used – see BNF) for 5 days[3]~~
Clarithromycin[6] ***or***	500 mg twice a day for 5 days[3]
Erythromycin[6] (in pregnancy)[4]	500 mg four times a day for 5 days[3]
Alternative oral antibiotics if moderate severity, for penicillin allergy; guided by microbiological results when available[2]	
Doxycycline	200 mg on first day, then 100 mg once a day for 4 days (5-day course in total)[3]
Clarithromycin	500 mg twice a day for 5 days[3]
First choice antibiotics if high severity (based on clinical judgement and guided by CRB65 score 3 or 4, or CURB65 score 3 to 5 when calculated); guided by microbiological results when available[2]	
Co amoxiclav ***with:***	500/125 mg three times a day orally or 1.2 g three times a day IV[7] for 5 days[3]
Clarithromycin ***or***	500 mg twice a day orally or IV[7] for 5 days[3]
Erythromycin (in pregnancy)[4]	500 mg four times a day orally for 5 days[3]
Alternative antibiotic if high severity, for penicillin allergy; guided by microbiological results when available[2]	
Levofloxacin[8] (consider safety issues)	500 mg twice a day orally or IV[7] for 5 days[3]
Consult local microbiologist if fluoroquinolone not appropriate	

[1]See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, pregnancy and breast-feeding, and administering intravenous (or, where appropriate, intramuscular) antibiotics.
[2]Give oral antibiotics first-line if the person can take oral medicines, and the severity of their condition does not require intravenous antibiotics.
[3]Stop antibiotic treatment after 5 days unless microbiological results suggest a longer course is needed or the person is not clinically stable (fever in the past 48 hours, or more than 1 sign of clinical instability [systolic BP <90 mm Hg, heart rate >100/min, respiratory rate >24/min, arterial oxygen saturation <90% or PaO_2 <60 mmHg in room air]).
[4]Erythromycin is preferred if a macrolide is needed in pregnancy, for example, if there is true penicillin allergy and the benefits of antibiotic treatment outweigh the harms.
See the Medicines and Healthcare products Regulatory Agency (MHRA) Public Assessment Report on the safety of macrolide antibiotics in pregnancy.
[5]*Mycoplasma pneumoniae* infection occurs in outbreaks approximately every 4 years.
[6]Consider adding a macrolide to amoxicillin if atypical pathogens suspected. Review when microbiological results available.
[7]Review intravenous antibiotics by 48 hours and consider switching to oral antibiotics if possible.
[8]See MHRA advice for restrictions and precautions for using fluoroquinolones due to very rare reports of disabling and potentially long-lasting or irreversible side effects affecting musculoskeletal and nervous systems. Warnings include stopping treatment at first signs of a serious adverse reaction (such as tendonitis), prescribing with special caution in people over 60 years and avoiding coadministration with a corticosteroid (March 2019).
C(U)RB65, confusion, (urea >7 mmol/l), respiratory rate ≥ 30/min, low systolic [<90 mm Hg] or diastolic [≤60 mm Hg] BP, age ≥65; IV, intravenous; PaO_2, partial pressure of oxygen

Table 3. Initial Treatment Strategies for Outpatients with Community-acquired Pneumonia

	Standard Regimen
No comorbidities or risk factors for MRSA or *Pseudomonas aeruginosa*[*]	Amoxicillin or
	doxycycline or
	macrolide (if local pneumococcal resistance is <25%)[†]
With comorbidities[‡]	Combination therapy with
	amoxicillin/clavulanate or cephalosporin
	AND
	macrolide or doxycycline[§]
	OR
	monotherapy with respiratory fluoroquinolone[‖]

Definition of abbreviations: ER = extended release; MRSA = methicillin-resistant *Staphylococcus aureus*.

*Risk factors include prior respiratory isolation of MRSA or *P. aeruginosa* or recent hospitalization AND receipt of parenteral antibiotics (in the last 90 d).

[†]Amoxicillin 1 g three times daily, doxycycline 100 mg twice daily, azithromycin 500 mg on first day then 250 mg daily, clarithromycin 500 mg twice daily, or clarithromycin ER 1,000 mg daily.

[‡]Comorbidities include chronic heart, lung, liver, or renal disease; diabetes mellitus; alcoholism; malignancy; or asplenia.

[§]Amoxicillin/clavulanate 500 mg/125 mg three times daily, amoxicillin/clavulanate 875 mg/125 mg twice daily, 2,000 mg/125 mg twice daily, cefpodoxime 200 mg twice daily, or cefuroxime 500 mg twice daily; AND azithromycin 500 mg on first day then 250 mg daily, clarithromycin 500 mg twice daily, clarithromycin ER 1,000 mg daily, or doxycycline 100 mg twice daily.

[‖]Levofloxacin 750 mg daily, moxifloxacin 400 mg daily, or gemifloxacin 320 mg daily.

Diagnosis and Treatment of Adults with Community-acquired Pneumonia. An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America

A study exploring public opinion and attitudes towards being vaccinated in a community pharmacy

Federico Zerbinato[1,2], *Antonella Tonna*[1]
[1] Robert Gordon University, Aberdeen; [2] Farmacia Zerbinato SNC, Pozzonovo (PD)

BACKGROUND

There is growing evidence that vaccination campaigns in Community Pharmacies (CPs) lead to greater awareness of the importance of vaccination and increase vaccination rates [1]. Italian community pharmacists have been administering vaccines since the COVID-19 pandemic [2]. In particular, in Veneto Region, appropriately trained community pharmacists started administering COVID-19 vaccines in July 2021 and the related booster doses in November 2021 [3].

OBJECTIVES

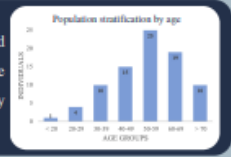
This study explored the public's opinion of attitudes towards being vaccinated in a community pharmacy and aimed to determine whether there is a role for the community pharmacist as a vaccination health educator.

SETTING AND METHODS

The study was conducted at a pharmacy in Pozzonovo (Padova, Veneto Region, ~ 3500 inhabitants), All the patients who have been vaccinated at this pharmacy and could be contacted via email or WhatsApp, were invited to participate. If consenting, they received a short questionnaire which had been piloted for face and content validity with other Italian community pharmacists. Staff members and their relatives vaccinated here were excluded. Participant responses represented the main outcome measures.

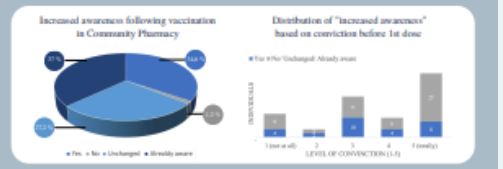
RESULTS

84 questionnaires were returned out of 171 sent (49% response rate). Participants were mainly 50 to 59 years old (29.8%).



"Ease of access" was chosen by 47 participants (56%) as main motivation for vaccination in a CP. Other reasons included straightforward system (48.8%), short waiting times (44%) and familiarity with pharmacy staff (42.9%). All participants showed high degrees of satisfaction towards the pharmacy staff and the CP as a vaccination hub.

All participants would choose a CP again for future vaccination. 28 participants (34.6%) stated their awareness of the importance of being vaccinated increased following vaccination in the CP; 16 of these said they were uncertain about the importance of vaccination on first attending the CP.



CONCLUSIONS

This study is limited by the fact that it is conducted only in one pharmacy but gives important pilot data in a rapidly developing area of pharmacy practice. In conclusion, the CP is accepted by the patients as a potential vaccination hub. Increased participant awareness of the importance of vaccination may have been due to factors such as opportunities to discuss vaccination with the pharmacy staff indicating a role for the community pharmacist as a vaccination health educator.

REFERENCES

1. Postel, A., Lau, E., Deldot, M., Campbell, C., Waite, N. and Nissen, L., 2019. Pharmacist role in vaccination: Evidence and challenges. Vaccine, 37(40), pp. 5939-5945.
2. GOVERNO ITALIANO, REGIONI E PROVINCE AUTONOME, FEDERFARMA and ASSOFARM, 2020. Legge di Bilancio 2021. Art.1 Comma 471 edn. Gazzetta Ufficiale della Repubblica Italiana.
3. REGIONE VENETO, 07/05/2021. Deliberazione della Giunta Regionale. 61 edn. Bollettino Ufficiale della Regione Veneto.

Encourage small-scale study … there is potential for this to inform practice and to be published

How is Antimicrobial Stewardship linked to environmental sustainability?

If no action is taken in addressing AMR, the global economic cost by 2050 will be US$ 100 trillion, impacting low-middle countries the most, widening the inequity gap. (1)

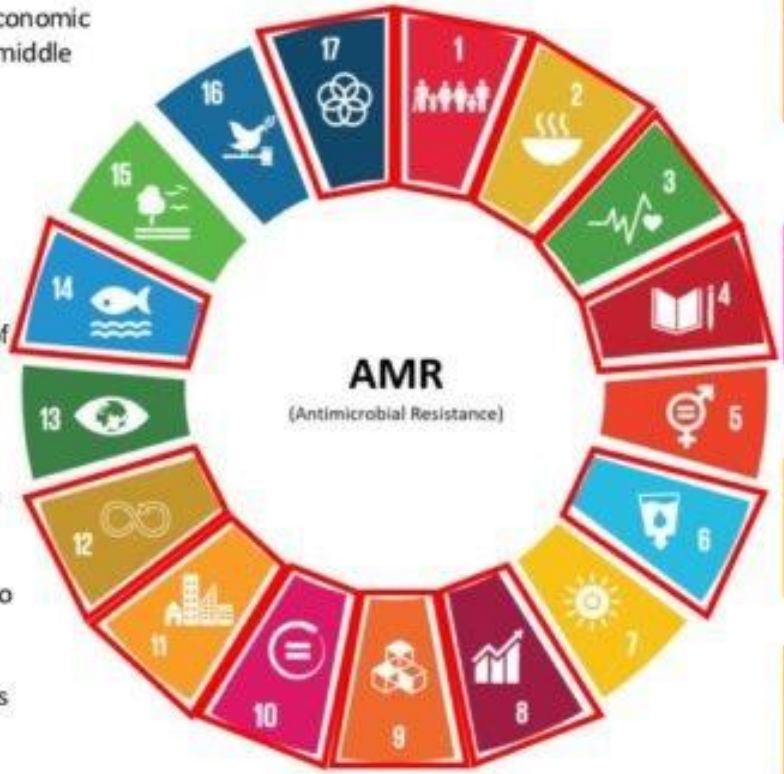
Misuse of veterinarian medicine in animals leads to additional use of other medicines, accumulating in ground water, land, humans, and back into animals. However, as agricultural pathogens become more resistant, we will not be able to ensure food security for our exponentially growing population. Taxation of antibiotics can push farmers to seek alternatives to their current practices. (1, 2, 3)

By 2050, 300 million individuals will die of AMR. Today, it is estimated that more than 30,000 women giving birth and 200,000 newborns die each year because of severe infections that are resistant to available drugs. Moreover, AMR is a huge threat to cancer treatment as antibiotics may no longer be effective. In the EU alone annually, it is estimated that AMR costs €1.5 billion a year in health care costs and productivity losses. (1)

Unless AMR is introduced in all school curricula, particularly for health care professionals to promote sustainable development, the rapidly growing number of people dying of AMR will not be reduced. (4)

Pharmaceutical and microbial hazard waste can reach and contaminate groundwater, drinking-water, soils, food crops and sediments. These potentially have serious environmental effects, including toxicity to wildlife and the generation of antibiotic-resistant bacteria. (1, 5)

The cost of drug-resistant infections is estimated to cause a decrease in economic output of US$ 1-3 trillion. (1)



Current authorization guidelines, such as those in the EU, tend to favour existing products, such as antibiotics or chemical pesticides. They at the same time create significant barriers for the development of alternatives in human health, meat production and agriculture. This obstructs SMEs to innovate and compete on a global market dominated by the antibiotic producing and distributing pharmaceutical industry. (6, 7, 8)

AMR affects all countries, but the burden is disproportionately higher in LMICs. Inadequate access to safe water and sanitation adds to the emergence and spread of drug resistance and is a key challenge for LMICs. Therefore, most of the direct and indirect impact of AMR will fall on LMICs if clinicians and veterinarians do not prescribe antibiotics when they are not needed. (9)

The cheap production of APIs (active pharmaceutical ingredients) particularly in China and India, contaminates local communities' natural resources. Importation of such APIs, in for instance the EU, robs the EU of drug independence and puts populations in emerging economies at serious risk. (10)

Global consumption of antimicrobials in food and animal production is estimated to rise by 70% by 2030. Instead of reduction, the use of antibiotics in agriculture is expected to rise by 67% according to the World Bank, due to the increasing demand for meat. (1, 11)

The overuse of antibiotics in fish farming results in the presence of many infectious drug-resistant pathogens. For instance, experiments on aquaculture found that farmed fish pathogens are resistant to up to 15 drugs. (12)

The EU Commission's Scientific Steering Committee in 1999 advised the immediate reduction in production and distribution of antibiotics, in order to prevent a future AMR catastrophe. No body heeded that advice, leading to then-WHO DG Margaret Chan to warn in 2012 about the rapidly dawning post-antibiotic era, which would disable curing of infections and disallow surgical operations. New partnerships are required to ensure the development and production of new antibiotics while securing limited use only. (13, 14, 15)

How can pharmacists support AMS therefore indirectly becoming involved in environmental sustainability?

Review patients on intravenous antibiotics for their suitability to change to oral

Familiarise ourselves with the local guidelines and provide advice to prescribers as/when required

Ensure safe disposal of antibiotics – for example if more syrup dispensed than prescribed

Educate patients particularly when no antibiotics are required and provide self-care advice

Get involved in new services that may be offered locally such as near-patient testing and vaccination

Explore ways of getting involved with educating school children about antibiotics (e.g. e-bug programme)

Get involved in providing prescribers with feedback following audit

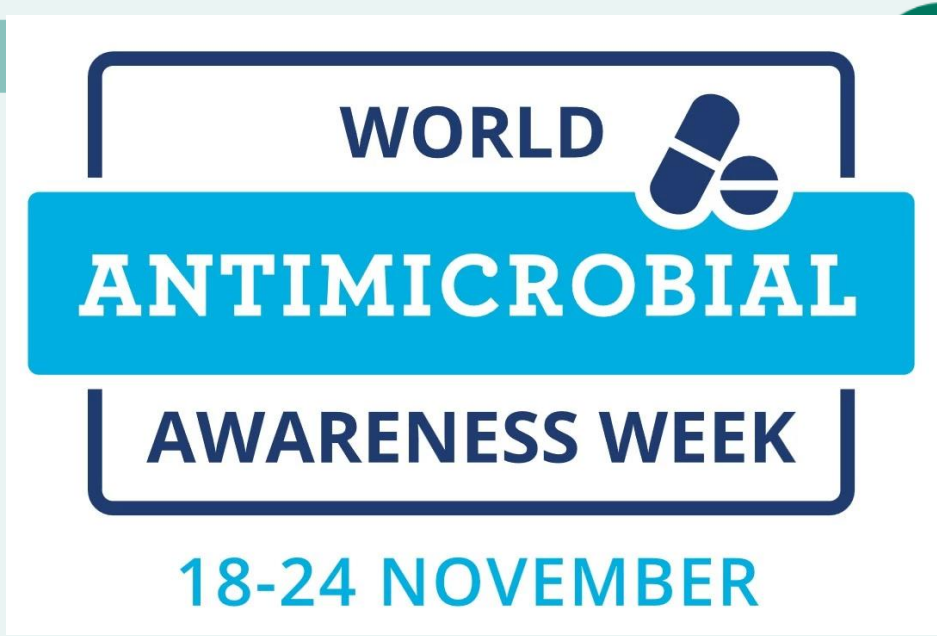
Getting involved in planning a campaign

18 to 24 November is World AMR Awareness Week

Antimicrobial resistance (AMR) occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines, making infections harder to treat and increasing the risk of disease spread, severe illness and death. As a result of drug resistance, antibiotics and other antimicrobial medicines become ineffective and infections become increasingly difficult or impossible to treat.

A global action plan to tackle the growing problem of resistance to antibiotics and other antimicrobial medicines was endorsed at the Sixty-eighth World Health Assembly in May 2015. One of the key objectives of the plan is to improve awareness and understanding of AMR through effective communication, education and training.

World AMR Awareness Week (WAAW) is a global campaign that is celebrated annually to improve awareness and understanding of AMR and encourage best practices among the public, One Health stakeholders and policymakers, who all play a critical role in reducing the further emergence and spread of AMR.



Plan a campaign

Translate this page

The toolkits offer template campaign materials which may be adapted for use at national level and advises on how campaign organisers could engage to promote appropriate and responsible use of antibiotics. These support the activity carried out by European national health authorities so as to achieve a comprehensive and consistent communications campaign across Europe with regard to the rational use of antibiotics.

Branding - Logo

The European Antibiotic Awareness day logo was designed to be used in all materials related to European Antibiotic Awareness Day and provide a consistent visual identity to all communications materials developed on this occasion.

Toolkit for primary care prescribers

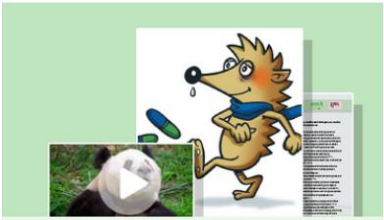
The toolkit contains template materials and key messages for health professionals, ideas for awareness raising activities, and suggested tactics for getting the messages across to both primary care providers and patients.

Toolkit for professionals in hospitals and other healthcare settings

The primary target audience for this toolkit is professionals in hospitals and other healthcare settings, such as long-term care facilities, who have different roles and influence in the use of antibiotics in such settings.

Toolkit on self-medication

The toolkit contains template materials and key messages focusing on self-medication with antibiotics, ideas for awareness raising activities, and suggested tactics for getting the messages across to the general public.



Toolkit for the general public

The toolkit offers template materials and advice on how campaign organisers could engage with the general public so as to promote appropriate and responsible use of antibiotics.

Toolkit - social media

Social media activities that could be undertaken as part of national prudent antibiotic use campaigns, targeting the general public, primary care prescribers and hospital prescribers.

GET INVOLVED!

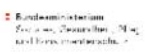
Campaigns in Europe

Translate this page

A number of initiatives are taking place across Europe to spread the messages on the risks associated with inappropriate use of antibiotics and how to take antibiotics responsibly.

Austria

AURES - der österreichische Antibiotikaresistenz-Bericht:
Bundesministerium für Soziales, Gesundheit Pflege und Konsumentenschutz



Maßnahmen im Bereich antimikrobieller Resistenzen (AMR)
Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz

NAP-AMR: Der österreichische Nationale Aktionsplan zur Antibiotikaresistenz
Bundesministerium für Soziales, Gesundheit Pflege und Konsumentenschutz

Symposium zum Europäischen Antibiotikatag:
Bundesministerium für Soziales, Gesundheit Pflege und Konsumentenschutz

Belgium

Gebruik antibiotica correct

Post activity evaluation

Thank you for your participation; kindly take a few minutes to complete the post-activity evaluation.

This is available at the link below or scan the QR code provided here.

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Thank you for joining this webinar tonight