

TONNA, A. 2023. Pharmacist involvement in antimicrobial stewardship in the UK. Presented at the 2nd MasterPharm 2023: international module: clinical pharmacy around the world models and systems, 8-10 March 2023, Turin, Italy.

Pharmacist involvement in antimicrobial stewardship in the UK.

TONNA, A.

2023

2nd EDITION

asterPharm 2023 **TURIN**

**International Module:
Clinical Pharmacy around the world
Models and Systems**

November 9th -10th 2023



In collaboration with



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Città della Salute e della Scienza di Torino

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Pharmacist involvement in antimicrobial stewardship in the UK

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DECLARATION ON COMMERCIAL INTERESTS

The undersigned Dr. Antonella Tonna

DECLARES:

the absence of commercial interests with companies
operating in the healthcare sector





An overview of education and training of pharmacists in the UK



An overview of settings in which UK pharmacists practice



Role of pharmacist in antimicrobial stewardship in the different settings



Preparation of the workforce for antimicrobial stewardship roles

GENERAL PHARMACEUTICAL COUNCIL INITIAL EDUCATION & TRAINING FOR PHARMACISTS IN THE UK (2021)

The independent regulator that regulates
pharmacists, pharmacy technicians and pharmacies
in the UK

5 years: 4 years UG and 1 year foundation training in practice

Structured upon a competency-based, spiral curriculum

Student/trainee pharmacists' skills, knowledge, understanding and professional behaviours will progress throughout their initial education and training.

As they go through their MPharm degree they will be expected to demonstrate the learning outcomes to a greater depth, breadth and degree of complexity.

The foundation training year will further expose student/trainee pharmacists to new situations and environments. Students sit a registration exam following completion of this year.

This will give them opportunities to build upon their knowledge and skills and demonstrate these with patients in clinical settings.



GPhC accredited pharmacy MPharm or OSPAP qualification

Must be awarded before starting the foundation training year, unless it is a sandwich course or an integrated degree.

GPhC foundation training year

Must be completed at an accredited training site with a designated supervisor and follow an approved training plan to meet interim learning outcomes.

GPhC registration assessment

Trainees are eligible to enter the assessment which tests the skills and knowledge they need to practise safely as a pharmacist, if they meet the interim learning outcomes at the appropriate levels.

Registering as a pharmacist

Trainees must meet the registration criteria, by completing all previous steps within a time limit, and confirming they are fit to practise.

2nd EDITION



General
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Standards for the initial education and training of pharmacists

January
2021

Domain: Person-centred care and collaboration

If they are to pass, students/trainees must be able to demonstrate the following at the end of each element of their initial education and training:

Table 1: Learning outcomes for person-centred care and collaboration

Learning outcome	MPharm degree	Foundation training year
1. Demonstrate empathy and keep the person at the centre of their approach to care at all times	Does	Does
2. Work in partnership with people to support and empower them in shared decision-making about their health and wellbeing	Shows how	Does
3. Demonstrate effective communication at all times and adapt their approach and communication style to meet the needs of the person	Does	Does
4. Understand the variety of settings and adapt their communication accordingly	Shows how	Does
5. Proactively support people to make safe and effective use of their medicines and devices	Shows how	Does
6. Treat people as equals, with dignity and respect, and meet their own legal responsibilities under equality and human rights legislation, while respecting diversity and cultural differences	Does	Does
7. Obtain informed consent before providing care and pharmacy services	Does	Does
8. Assess and respond to the person's particular health risks, taking account of individuals' protected characteristics and background	Shows how	Does
9. Take responsibility for ensuring that personal values and beliefs do not compromise person-centred care	Does	Does
10. Demonstrate effective consultation skills, and in partnership with the person, decide the most appropriate course of action	Does	Does
11. Take into consideration factors that affect people's behaviours in relation to health and wellbeing	Shows how	Does

Describing and assessing outcomes

The outcome levels in this standard are based on an established competence and assessment hierarchy known as 'Miller's triangle':

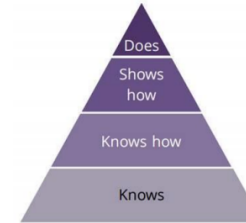


Figure 1: Miller's triangle

Because what is being assessed at each of the four levels is different, the assessment methods needed are different too - although there will be some overlap.

Level 1 - Knows

Has knowledge that may be applied in the future to demonstrate competence. Assessments may include essays, oral examinations and multiple-choice question examinations (MCQs).

Level 2 - Knows how

Knows how to use knowledge and skills. Assessments may include essays, oral examinations, MCQs and laboratory books.

Level 3 - Shows how

Can demonstrate that they can perform in a simulated environment or in real life. Assessments may include objective structured clinical examinations (OSCEs) and other observed assessments; simulated patient assessments; designing, carrying out and reporting an experiment; dispensing tests and taking a patient history.

Level 4 - Does

Can act independently and consistently in a complex but defined situation. Evidence for this level is provided when a student pharmacist demonstrates the learning outcomes in a complex, familiar or everyday situation repeatedly and reliably. Assessments may include OSCEs or other observed assessments.



Pharmacist independent prescribing in the UK

- 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.

[General
Pharmaceutical
Council](#)

**Standards for the education and
training of pharmacist
independent prescribers**

Updated October 2022

- 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



Domain: professional knowledge and skills

If they are to pass, trainees must be able to demonstrate the following at the end of each element of their pharmacist independent prescribing education and training:

Table 3: Professional knowledge and skills

Learning outcome	Level
16. Apply evidence-based decision-making in all aspects of prescribing	Does
17. Manage the risks and benefits associated with prescribing decisions	Does
18. Demonstrate the application of pharmacology in relation to their own prescribing practice	Does
19. Demonstrate clinical and diagnostic skills in clinical settings appropriate to their scope of practice	Does
20. Create and maintain appropriate records which ensure safe and effective care and align with relevant legislation	Does
21. Identify relevant investigations and interpret results and data in their	Does

AN OVERVIEW OF PHARMACIST PRACTICE SETTINGS

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 professionals
- 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



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

2nd EDITION



The pharmacy contribution to antimicrobial stewardship

Pharmacist expertise and clinical knowledge must be fully utilised to ensure appropriate use of antibiotics and improve stewardship, in order to reduce antimicrobial resistance.

SEPTEMBER 2017

**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 Union² (PGEU) and the International Pharmaceutical Federation³ (FIP) in the global fight against Antimicrobial Resistance (AMR).



Evolution of the
role of the
pharmacist in
antimicrobial
stewardship in UK

Initially main focus
only on hospitals

Around 2001, shift
from only
monitoring role to
an advising role

Development of
concept of specialist
antimicrobial
pharmacists

Expansion of role to
be integral part of
AMS
multidisciplinary
team

Seen as crucial to
reduce resistance
and antibiotic
associated
complications



Some 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.



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

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.

Check microbiology results; can you narrow the spectrum of IV therapy?

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 IVOST once the initial bacterial burden has been sufficiently reduced by intravenous therapy.

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



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.

54

Tackling antimicrobial resistance 2019–2024

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.

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.



HM Government

Tackling antimicrobial resistance 2019–2024

The UK's five-year national action plan

Published 24 January 2019

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



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



**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

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

the PHARMACEUTICAL JOURNAL

Monthly edition	News	CPD & Learning	Research	PJ Jobs	
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Diagnostics

04 May 2018



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 (60%) 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 optimization 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

<p>✗ ANTIBIOTICS DON'T WORK FOR</p> <ul style="list-style-type: none"> Colds Flu Coronavirus (COVID-19) Viruses Sore throats Most coughs Most ear infections Most sore throats Most diarrhoea Most cystitis <p>TAKE YOUR PHARMACIST'S ADVICE</p>	<p>✓ ANTIBIOTICS ARE NEEDED FOR</p> <ul style="list-style-type: none"> Serious bacterial infections including: <ul style="list-style-type: none"> Septis Pneumonia Urinary tract infections Sexually transmitted infections like gonorrhoea Meningococcal meningitis <p>TAKE YOUR DOCTOR'S ADVICE</p>
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Keep Antibiotics Working

UNFORTUNATELY, NO AMOUNT OF ANTIBIOTICS WILL GET RID OF YOUR COLD.

The best way to treat most colds, coughs or sore throats is plenty of fluids and rest. For more advice talk to your pharmacist or doctor.

NHS

IF A COLD IS MAKING YOU FEEL UNDER THE WEATHER, ANTIBIOTICS AREN'T GOING TO HELP.

Antibiotics don't work on viruses, which cause a sore throat. The best way to treat most colds, coughs or sore throats is plenty of fluids and rest. Taking antibiotics for your cold or sore throat can be harmful to your health. For more advice talk to your pharmacist or doctor.

NHS

REMEMBER, ANTIBIOTICS WON'T HELP YOUR DEFENCES AGAINST A COLD.

The best way to treat most colds, coughs or sore throats is plenty of fluids and rest. For more advice talk to your pharmacist or doctor.

NHS

I DON'T CURE THE COLD

NOT FOR A SORE THROAT

DON'T NEED ME FOR SINUS INFECTIONS

I'M NO HELP WITH A COUGH



**How are healthcare
professionals trained to
ensure they are competent
in antimicrobial
stewardship?**

Competency-based education approach in UK

- Imperative to embed AMS into the curricula of all healthcare professionals
- AMS is a key activity that all healthcare professionals need to master, both for patient benefit, and to ensure environmental sustainability through sustainable prescribing
- A UK wide set of consensus-based, AMS competencies for undergraduate healthcare professional education was published in 2018
- Competency based education is the better pedagogic approach here since it is not just about knowledge but also about having the skills and behaviours to apply this knowledge effectively

Undergraduate education

Journal of Hospital Infection 100 (2018) 245–256



Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevier.com/locate/jhin



Development of consensus-based national antimicrobial stewardship competencies for UK undergraduate healthcare professional education

M. Courtenay^{a,*}, R. Lim^b, E. Castro-Sanchez^c, R. Deslandes^d, K. Hodson^d, G. Morris^{a,e}, S. Reeves^f, M. Weiss^d, D. Ashiru-Oredope^g, H. Bain^h, A. Blackⁱ, J. Bosanquet^g, A. Cockburn^j, C. Duggan^k, M. Fitzpatrick^l, R. Gallagher^m, D. Grant^b, J. McEwenⁿ, N. Reid^o, J. Sneddon^p, D. Stewart^q, A. Tonna^q, P. White^r

Courtney, (2018) AMS competencies for UG HCP education in the UK

6 domains, with competency statements, and 54 descriptors

Domain	Description
1	Infection Prevention & Control
2	Antimicrobials & Antimicrobial Resistance
3	Antimicrobial Prescribing
4	Antimicrobial Prescribing Practice
5	Person-centred Care
6	Interprofessional Collaborative Practice

Domain 1: Infection Prevention & Control

1	Describing what a micro-organism is
2	Describing the different types of organisms that may cause infections
3	Explaining what an antimicrobial resistant organism is.
4	Explaining the 'chain of infection'.
5	Defining the components required for infection transmission (i.e. presence of an organism, route of transmission of the organism from one person to another, a host who is susceptible to infection).
6	Describing the routes of transmission of infectious organisms, i.e. contact, droplet, airborne routes.
7	Present and recognize the characteristics of a susceptible host.
8	Demonstrate an understanding of the importance of surveillance.
9	Describe how vaccines can prevent infections in susceptible persons
10	Demonstrate the application of standard precautions in healthcare environments.
11	Apply appropriate policies/procedures and guidelines when collecting and handling specimens.
12	Apply policies, procedures and guidelines relevant to infection control when presented with infection control cases and situations.
13	Implement work practices that reduce risk of infection (such as taking appropriate immunization or not coming to work when sick to ensure patient and other healthcare worker protection).
14	Appreciate that healthcare workers have the accountability and obligation to follow infection control protocols as part of their contract of employment.
15	Act as a role model to healthcare workers and members of the public by adhering to infection prevention and control principles.
16	Demonstrating knowledge and awareness of international/national strategies on infection prevention and control and antimicrobial resistance such as Global Action Plan for AMR and Save Lives – Clean Your Hands http://www.who.int/gpsc/5may/en/ and the UK Government's 5-year Antimicrobial Resistance Strategy.

Group set up in September 2022: National Antimicrobial Stewardship Pharmacist Educator Group

Implementation of the national antimicrobial stewardship competencies for UK undergraduate healthcare professional education within undergraduate pharmacy programmes: a survey of UK schools of pharmacy.

Objective:

To explore which of the AMS competencies are delivered, including when and at which level within UK undergraduate pharmacy programmes.

Methods:

A cross-sectional online questionnaire captured the level of study in which each competency was taught, the method of delivery and assessment of AMS education and examples of student feedback.

Conclusions

- UK schools of pharmacy should utilize the competency framework to identify gaps in their AMS, AMR and infection teaching.
- To prepare newly qualified pharmacists to be effective at delivering AMS and prescribing antimicrobials, schools of pharmacy should utilize more simulated environments and clinical placements for education and assessment of AMS.

Findings:

- No institution reported covering all 54 AMS competencies and 5 of these were taught at half or fewer of the institutions.
- Key gaps were identified around taking samples, communication, outpatient parenteral antimicrobial therapy and surgical prophylaxis.
- The minimum time dedicated to AMS teaching differed between institutions (range 9–119 h).
- Teaching was generally through didactic methods, and assessment was generally through knowledge recall and objective structured clinical examinations.

JOURNAL ARTICLE

Implementation of the national antimicrobial stewardship competencies for UK undergraduate healthcare professional education within undergraduate pharmacy programmes: a survey of UK schools of pharmacy

Ryan A Hamilton, Molly Courtenay, Kevin J Frost, Roger Harrison, Helen Root, David G Allison, Antonella P Tonna, Diane Ashiru-Oredope, Mamoona A Aldeyab, Katherine Shemilt, Sandra J Martin 

JAC-Antimicrobial Resistance, Volume 5, Issue 4, August 2023, dlad095,
<https://doi.org/10.1093/jacamr/dlad095>

Published: 08 August 2023 [Article history](#) ▼

INFECTION AND ANTIMICROBIAL STEWARDSHIP

EXPERT PROFESSIONAL PRACTICE CURRICULUM

Professional curriculum to support members with
the knowledge, skills, experience and behaviours
to advance in their practice

2014

ROYAL PHARMACEUTICAL SOCIETY
FACULTY

UKCPA
CLINICAL PHARMACY ASSOCIATION



Guidance ... Currently
being updated

In practice ...

4 Management of clinical syndromes	Specialist or Generalist	Advanced Stage I, Advanced Stage II or Mastery
Gastrointestinal System		
Common bacterial GI infections presenting in UK clinical practice e.g. intra-abdominal infections, infective diarrhoea, travellers' diarrhoea, H. Pylori.	G	-
Management options for bacterial GI infections.	G	-
Management of Candida fungal infections affecting the GI tract.	G	-
Management of H. pylori including antimicrobial regimens used.	G	-
Risk factors for development of Clostridium difficile infection (CDI).	G	-
Management of CDI including infection control precautions, severity assessment and antimicrobial therapy.	S	ASI
Strategies and local protocols for managing recurrence of CDI.	S	ASI
Norovirus (winter vomiting virus) and precautions required to prevent spread.	G	-
Outbreak management for norovirus in hospital and/or community settings.	S	ASII
Management of tropical and protozoal infections.	S	ASII
Surgical conditions of the GI tract which may require antimicrobial therapy.	G	-
Use of antimicrobial therapy in surgical conditions affecting the GI tract.	S	ASI
Use of antimicrobials for surgical prophylaxis in patients undergoing GI surgery.	G	-
Management of surgical site infections following GI surgery.	G	-
Cardiovascular System		
Risk factors, clinical features and diagnosis of infective endocarditis (IE).	S	ASI
Common causative organisms for IE.	S	ASI
Initial management of IE including investigations and antimicrobial therapy.	S	ASI
Ongoing treatment options for completion of antimicrobial therapy.	S	ASII
Role of antimicrobial prophylaxis for prevention of IE.	G	-
Use of antimicrobials for surgical prophylaxis in patients undergoing cardiac surgery.	G	-
Management of surgical site infections following cardiac surgery.	S	ASI
Respiratory System		
Main types of upper respiratory infections (URTI) presenting in primary care.	G	-
Management strategies available for URTL.	G	-
Evidence base supporting prudent use of antimicrobials in URTL.	G	-
Differentiation of upper and lower respiratory tract infections.	G	-
Main types of lower respiratory tract infections (LRTI).	G	-
Differentiation between community acquired, hospital acquired and ventilator associated pneumonias.	S	ASI
Pneumonia causative organisms, use of severity assessment scores and choice of antimicrobial therapy.	S	ASI
Antimicrobial therapy options for complicated respiratory infections e.g. legionella, ventilator associated pneumonia, Pneumocystis carinii.	S	ASII
Chronic lung infections e.g. cystic fibrosis, bronchiectasis, and their management.	S	ASI
Diagnosis and management of drug sensitive pulmonary tuberculosis.	S	ASI
Diagnosis and management of multi-drug resistant pulmonary tuberculosis.	S	ASII
Diagnosis and management of non-pulmonary tuberculosis.	S	ASII



Thank you

