

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



Disclaimer

This publication is intended as a guide and may not always include all information relating to its subject matter.

You should interpret all information and advice in light of your own professional knowledge and all relevant pharmacy and healthcare literature and guidelines.

Nothing in this publication constitutes legal advice and cannot be relied upon as such.

Whilst care has been taken to ensure the accuracy of content RPSGB excludes to the fullest extent permissible by law any liability whether in contract, tort or otherwise arising from your reliance on any information or advice.

This curriculum has been produced by RPS Faculty partners to support continued advancement in all areas of pharmacy practice.

During 2014 the Curricula Panel of the RPS Faculty will continue to develop the vision for post graduate development to produce the highest quality pharmacy workforce. The Faculty will continue to work with experts and specialist groups to form new guidance for professional advancement. The layout and themes in these curricula may be subject to change. Reviews of curricula can be expected annually while the Faculty is being set up. Please check that you are using the most up to date version of the curricula on the RPS Faculty website (www.rpharms.com/faculty).

Acknowledgements

The mapping tables in this document use the Royal Pharmaceutical Society Advanced Pharmacy Framework (APF) which builds on the widely used Advanced to Consultant Level Framework (ACLF) which was developed by the Competency Development and Evaluation Group (CoDEG).

Primary Contributors

- Mark Gilchrist. Chair of UKCPA Infection Management Group (IMG), Consultant Pharmacist – Infection, Imperial College Healthcare NHS Trust.
- Jacqueline Sneddon. IMG Lead for Certification portfolio, Project Lead for Scottish Antimicrobial Prescribing Group, Scottish Medicines Consortium.
- Hayley Wickens. IMG Lead for Certification portfolio, Consultant Pharmacist, Anti-infectives, University Hospital Southampton NHS Foundation Trust.

Comments and additions from

- Mala Shah, Senior Pharmacist Antimicrobials, Cork University Hospital.
- Kevin Frost, Antimicrobial Pharmacist, Airedale NHS Foundation Trust.
- Naomi Fleming, Antibiotics Pharmacist, Milton Keynes Community Health Partnership.
- Katie Hatton, Clinical Pharmacist Acute Medicine, Addenbrooke's NHS Trust.
- Members of the UKCPA Infection Management Group committee.
- Members of the Infection Consultant Pharmacists group.
- Executive Team, Association of Scottish Antimicrobial Pharmacists group.

Reviewed by

- Pending – see disclaimer

Professional Curriculum for Advanced Pharmacy Practice in Infection and Antimicrobial Stewardship

This curriculum provides an overview of the knowledge, skills, experiences and behaviours required to practice at advanced level in Infection and Antimicrobial Stewardship at three stages: Advanced Stage I, Advanced Stage II and Mastery, in line with the requirements of the APF.

The document is intended to be used by practitioners to support the development of their practice at an advanced level within Infection and Antimicrobial Stewardship. It encourages practitioners to think critically and to use knowledge in Infection and Antimicrobial Stewardship supporting informed decision making using knowledge from this and other related therapeutic areas to promote optimal medicines management for patients. The curriculum also encourages the development of skills in informed, critically relevant, effective discussion with other health and social care practitioners, peers and managers, where appropriate, to maximise optimal medicines related care for patients.

It is intended to be as useful to the wider community working within Infection and Antimicrobial Stewardship as possible from all sectors of care. The syllabus is not intended to cover every aspect of practice and inevitably overlaps with a number of specialities. Users are encouraged to link this syllabus with others in related fields, e.g. Critical Care, and HIV (also known as critical adjacencies).

This curriculum will be reviewed annually as to whether any update or changes are required. Every five years there will be an external review including external experts to re-evaluate the curriculum. Feedback is encouraged to ensure that the document is error-free, fit for purpose and accurately reflects the needs of pharmacists working at the specified stages.

Knowledge, Skills, Experience and Behaviours

Practitioners will develop their portfolios linked to the APF (www.rpharms.com). The recommended knowledge, skills, experience and behaviours which practitioners require to demonstrate competence at Advanced Stage I, Advanced Stage II and Mastery stage for the Expert Professional Practice and Collaborative Working Relationships clusters of the APF in an area of advanced practice, are listed here with additional notes and specific examples for working within Infection and Antimicrobial Stewardship. The APF mapping tables in this document link the recommended knowledge, skills, experience and behaviours with the relevant developmental descriptors. Examples of the recommended knowledge, skills, experience and behaviours are included below. For a comprehensive list see the mapping tables.

Advanced Stage I

- New to specialist post with background in clinical pharmacy. More senior Antimicrobial Pharmacist is line manager. Provides basic antimicrobial pharmacy service including review of policy/guidance (under supervision), data collection and analysis and education of healthcare staff, usually in a single hospital setting.
- May also have a clinical commitment and/or a primary care remit.

Advanced Stage II

- Experience in antimicrobial pharmacy or related clinical post e.g. Infectious Diseases. May be sole post within a region and line manager is more senior clinical pharmacist or team leader or more senior Antimicrobial Pharmacist.
- Has greater autonomy and involvement in some strategic areas relating to use of antimicrobials at hospital/regional level. Member of Antimicrobial Team and may be pharmacy representative on Infection Prevention Control Team.
- Provides basic antimicrobial pharmacy service including review of policy/guidance, data collection and analysis and education of healthcare staff. May also have a clinical commitment and/or a primary care remit.

Mastery

- Experience in antimicrobial pharmacy and management of staff and/or service. Chief Pharmacist/Director of Pharmacy is line manager.
- Pharmacy representative on Antimicrobial Team and Infection Prevention Control Team plus extensive links with Risk Management staff and Board/Trust Management.
- Key role in developing and delivering strategy for antimicrobial stewardship at hospital and regional levels and inputs to national strategy. Input to hospital and regional HAI agenda including outbreak management and significant event analysis.
- Responsible for implementation of national guidance on antimicrobial use/infection, provision of local antimicrobial use and audit data and development/ delivery of antimicrobial education at regional level.
- May provide some elements of basic antimicrobial pharmacy service but main role is in leading the antimicrobial pharmacy team and wider clinical pharmacy team in delivering stewardship.

Resources for Curriculum Development

Useful Websites

- Public Health England (PHE)
- Scottish Antimicrobial Prescribing Group (SAPG)
- British Society for Antimicrobial Chemotherapy (BSAC)
- British Infection Association (BIA)
- Prudent Antibiotic User website (Pause)
- Royal Pharmaceutical society of Great Britain (RPS)
- National Institute for Health and Care Excellence (NICE)
- Scottish Intercollegiate Guideline Network (SIGN)
- United Kingdom Clinical Pharmacy Association (UKCPA)
- British National formulary (BNF)
- Electronic Medicines Compendium (medicines.org)
- European Centre for Disease Prevention and Control (ECDC)
- Infectious Diseases Society of America (IDSA)
- Centers for Disease Control and Prevention (CDC)
- John Hopkins Medicine

Textbooks

- The Sanford Guide to Antimicrobial Therapy
- Kucers' The Use of Antibiotics: A Clinical Review of Antibacterial, Antifungal and Antiviral Drugs Renal drug handbook

Examples of Journals to Refer to

- Journal of Antimicrobial Chemotherapy
- Journal of Infection
- Antimicrobial Agents and Chemotherapy
- Clinical Infectious Diseases
- Lancet infectious Diseases
- International Journal of Antimicrobial Agents
- New England Journal of Medicine
- American Journal of Health-System Pharmacy

National Guidance

- Secondary Care
- Start Smart then Focus, Department of Health 2011
- UK Five Year Antimicrobial Resistance Strategy 2013 to 2018
- Antimicrobial prescribing and stewardship competencies, ARHAI 2013
- Primary care
- Public Health England Management of Infection Guidance for Primary Care
- Target Antibiotics, Royal College of General Practitioners

Supporting References and External Resources

- Chief Medical Officer annual report 2013, Department of Health
- Regional Antimicrobial Pharmacists Groups (contact UKCPA IMG secretary for details)

APF Mapping Tables

The following tables list the knowledge, skills, experience and behaviours for Infection and Antimicrobial Stewardship recommended to demonstrate the APF competencies for the Expert Professional Practice (EPP) clusters which are mapped against the relevant APF developmental descriptors. It is intended primarily to support practitioners to develop their practice, but may be useful for portfolio preparation. All statements relate to the practitioner's area of practice speciality.

These tables do not include competency mapping tables for the following Core Professional Practice Curricula: Leadership; Management; Research and Evaluation; Collaborative Working Relationships; Education, Training and Development. These competencies are essential to the Infection and Antimicrobial Stewardship Expert Professional Curriculum and can be found on the RPS website under Advanced Pharmacy Framework.

The competencies listed for "Advanced Stage I", "Advanced Stage II" and "Mastery" stage are additive, i.e. those at "Advanced Stage II" build on the competencies established in "Advanced Stage I". Practitioners are expected to demonstrate "Advanced Stage I" first before moving on to "Advanced Stage II". Those wishing to demonstrate "Advanced Stage II" will usually be expected to have demonstrated "Advanced Stage I" previously. Those wishing to demonstrate "Mastery" stage will usually be expected to have demonstrated "Advanced Stage II" previously.

A pharmacist starting to specialise in an area of Expert Professional Practice might be expected to be working towards attaining competencies at Advanced Stage I. A practitioner having attained Advanced Stage I in an area of Expert Professional Practice might be expected to be working towards attaining competencies at Advanced Stage II.

At Advanced Stage I practitioners are expected to build on the General Level Framework (see CoDEG's website: www.codeg.org) competencies and (for the relevant developmental descriptors) to demonstrate experience of caring for patients with disorders, pharmaceutical care issues and co-morbidities that are commonly found within Infection and Antimicrobial Stewardship.

At Advanced Stage II practitioners are expected to build on Advanced Stage I competencies and (for the relevant developmental descriptors) to demonstrate experience of caring for patients with complex co-morbidities or pharmaceutical care issues or those with more specialist conditions within Infection and Antimicrobial Stewardship.

At Mastery stage practitioners are expected to build on Advanced Stage II competencies and (for the relevant developmental descriptors) to demonstrate experience of caring for patients with complex co-morbidities or pharmaceutical care issues, or those with more specialist conditions within Infection and Antimicrobial Stewardship.

Expert Professional Practice – Expert Skills and Knowledge (Cluster I.1)

Improving standards of pharmaceutical care for patients.

I.1 EXPERT SKILLS AND KNOWLEDGE	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
<p>APF competency developmental descriptors</p>	<p>Demonstrates general pharmaceutical skills and knowledge in core areas.</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review general pharmaceutical care programmes for patients in core areas.</p>	<p>Demonstrates in-depth pharmaceutical skills and knowledge in defined area(s).</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review in-depth/complex pharmaceutical care programmes for patients in defined area(s).</p>	<p>Advances the knowledge base in defined area(s).</p> <p>In addition for patient focussed roles: Advances in-depth/complex pharmaceutical care programmes for patients.</p>
<p>Recommended knowledge, skills, experience and behaviours</p>	<p>Application of core specialist antimicrobial knowledge of common infections and common co-morbidities (including: aetiology, physiology, common signs and symptoms, epidemiology, risk factors).</p> <p>Application of core specialist antimicrobial knowledge of common antimicrobials (including: place in therapy, mechanism of action, indications, common adverse effects and drug interactions, and precautions).</p> <p>Application of core specialist antimicrobial knowledge for the therapeutic management of common infections and to ensure safe prescribing.</p> <p>Application of core specialist antimicrobial knowledge in the management of common pharmaceutical issues.</p> <p>Able to develop and implement plans for the pharmaceutical care of patients with common infections.</p>	<p>Application of advanced knowledge of common infections and co-morbidities seen in people with infections.</p> <p>Application of advanced knowledge and understanding of antimicrobials, including high-risk drugs, unlicensed drugs and off-label use of drugs.</p> <p>Application of advanced knowledge of antimicrobials for the therapeutic management of patients with complex co-morbidities and high risk factors, and to ensure safe prescribing for these patients.</p> <p>Able to identify, manage and advise on complex infective pharmaceutical care issues.</p> <p>Able to develop and implement plans for the care of patients with complex pharmaceutical care issues and those with more complex infective conditions. This may include non-medical prescribing.</p>	<p>Application of expert knowledge of common and complex infections and co-morbidities seen in people with infections.</p> <p>Application of expert knowledge and understanding of antimicrobials, including high-risk drugs, unlicensed drugs and off-label use of drugs.</p> <p>Application of expert knowledge of antimicrobials for the therapeutic management of patients with complex co-morbidities and high risk factors, and to ensure safe prescribing for these patients.</p> <p>Able to develop a personalised pharmaceutical care plan for complex and specialist infection conditions and take responsibility for that plan. This may include non-medical prescribing.</p>

Expert Professional Practice – Expert Skills and Knowledge (Cluster I.1)

Improving standards of pharmaceutical care for patients.

I.1 EXPERT SKILLS AND KNOWLEDGE	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
<p>APF competency developmental descriptors</p>	<p>Demonstrates general pharmaceutical skills and knowledge in core areas.</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review general pharmaceutical care programmes for patients in core areas.</p>	<p>Demonstrates in-depth pharmaceutical skills and knowledge in defined area(s).</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review in-depth/complex pharmaceutical care programmes for patients in defined area(s).</p>	<p>Advances the knowledge base in defined area(s).</p> <p>In addition for patient focussed roles: Advances in-depth/complex pharmaceutical care programmes for patients.</p>
<p>Recommended knowledge, skills, experience and behaviours</p>	<p>Able to identify patients with complex co-morbidities, pharmaceutical needs, interface or social issues that may impact on pharmaceutical care, and ensures that appropriate pharmaceutical care is provided (including referring where appropriate).</p> <p>Able to recognise, recommend and review appropriate monitoring of common infections and medicines for the pharmaceutical care of patients with infections.</p> <p>Able to interpret and use common lab tests and/or disease markers for the pharmaceutical care of patients with infections.</p> <p>Able to carry out medication review and develop and implement a medicines management plan for patients with common infections and common pharmaceutical care needs.</p> <p>Able to make recommendations on the pharmaceutical care of patients with infections based on the evidence-base and/or best practice.</p>	<p>Actively identifies and manages patients with complex co-morbidities, pharmaceutical needs, interface or social issues that may impact on pharmaceutical care.</p> <p>Able to advise on the appropriate monitoring of infections and medicines for patients with complex infective pharmaceutical care needs.</p> <p>Able to interpret and use complex/specialist lab tests and/or disease markers for the pharmaceutical care of patients with infections.</p> <p>Able to carry out medication review and develop and implement a medicines management plan for patients with infections and complex co-morbidities, high risk disorders and/or complex pharmaceutical needs.</p> <p>Able to make recommendations on the pharmaceutical care of complex patients with infections based on the evidence-base and/or best practice.</p>	<p>Able to develop and be accountable for an appropriate monitoring plan for patients with complex infective pharmaceutical care needs.</p> <p>Uses expert clinical practice to interpret complex laboratory tests and/or disease markers in the management of patients with infections.</p> <p>Accountable for medication review and medicines management plans for patients with complex co-morbidities, high risk disorders and/or complex infective pharmaceutical care needs.</p> <p>Accountable for the pharmaceutical care of complex patients with infections based on the evidence-base and/or best practice.</p>

Expert Professional Practice – Expert Skills and Knowledge (Cluster 1.1)

Improving standards of pharmaceutical care for patients.

1.1 EXPERT SKILLS AND KNOWLEDGE	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
<p>APF competency developmental descriptors</p>	<p>Demonstrates general pharmaceutical skills and knowledge in core areas.</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review general pharmaceutical care programmes for patients in core areas.</p>	<p>Demonstrates in-depth pharmaceutical skills and knowledge in defined area(s).</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review in-depth/complex pharmaceutical care programmes for patients in defined area(s).</p>	<p>Advances the knowledge base in defined area(s).</p> <p>In addition for patient focussed roles: Advances in-depth/complex pharmaceutical care programmes for patients.</p>
<p>Recommended knowledge, skills, experience and behaviours</p>	<p>Able to describe the main principles of the relevant key papers and national documents relating to management of infection and antimicrobial stewardship.</p> <p>Able to follow relevant policies and local and national guidance on management of infection and antimicrobial stewardship.</p> <p>Able to advise others in the team on the management of patients with common infective pharmaceutical care issues.</p> <p>Able to consult with, educate and advise patients, carers, pharmacy staff, students, medical staff, nursing staff and other allied healthcare professionals (AHPs) effectively on common infective pharmaceutical care issues and related relevant healthcare issues within the organisation.</p> <p>Able to support other staff in core specialist aspects of pharmaceutical and related care.</p> <p>Able to describe the structure of the service, the system of care, and the roles of the healthcare professionals and other relevant teams, disciplines or agencies involved in patient care.</p>	<p>Applies the main principles of key papers, policies, national documents, and local and national guidance to the care of patients with infection, complex co-morbidities, high risk disorders and/or complex pharmaceutical needs.</p> <p>Advises others in the team on the management of patients with complex infective pharmaceutical care issues.</p> <p>Able to advise on the choice and use of relevant specialist resources to resolve complex infective pharmaceutical care issues.</p> <p>Applies and advises on pharmacokinetic and pharmacodynamic principles to ensure safe and effective prescribing of antimicrobials.</p> <p>Able to consult with, educate and advise patients, carers, pharmacy staff, students, medical staff, nursing staff and other allied healthcare professionals (AHPs) effectively on complex infective pharmaceutical care issues and related relevant healthcare issues within and outside the organisation.</p>	<p>Accountable within the team for the management of patients with complex infective pharmaceutical care issues.</p> <p>Accountable for the choice and use of relevant specialist resources to resolve complex infective pharmaceutical care issues.</p> <p>Accountable for advice on pharmacokinetic and pharmacodynamic principles to ensure safe and effective prescribing of antimicrobials.</p>

Expert Professional Practice – Expert Skills and Knowledge (Cluster I.1)

Improving standards of pharmaceutical care for patients.

I.1 EXPERT SKILLS AND KNOWLEDGE	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
<p>APF competency developmental descriptors</p>	<p>Demonstrates general pharmaceutical skills and knowledge in core areas.</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review general pharmaceutical care programmes for patients in core areas.</p>	<p>Demonstrates in-depth pharmaceutical skills and knowledge in defined area(s).</p> <p>In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review in-depth/complex pharmaceutical care programmes for patients in defined area(s).</p>	<p>Advances the knowledge base in defined area(s).</p> <p>In addition for patient focussed roles: Advances in-depth/complex pharmaceutical care programmes for patients.</p>
<p>Recommended knowledge, skills, experience and behaviours</p>	<p>Able to apply and comply with the relevant legal, ethical, professional and organisational policies and procedures and codes of conduct issues that have implications for the pharmaceutical care of patients with infections.</p> <p>Able to apply pharmacoeconomic principles and support drug expenditure analysis work for antimicrobials.</p>	<p>Able to support other staff in advanced aspects of specialist pharmaceutical and related care of patients with infections.</p> <p>Able to influence the structure of the antimicrobial stewardship service, the system of care, and the roles of the healthcare professionals and other relevant teams, disciplines or agencies involved in patient care.</p> <p>Able to advise on the relevant legal, ethical, professional and organisational policies and procedures and codes of conduct issues that have implications for the pharmaceutical care of patients with infections.</p> <p>Interprets, undertakes and communicates drug expenditure analysis and advises on relevant pharmacoeconomic issues relating to antimicrobials.</p>	<p>Displays expert practice on the relevant legal, ethical, professional and organisational/strategic policies and procedures and codes of conduct issues that have implications for the pharmaceutical care of patients with infections.</p> <p>Interprets, undertakes and communicates drug expenditure analysis and advises on relevant pharmacoeconomic issues relating to antimicrobials at a higher/strategic level.</p>

Expert Professional Practice – Delivery of Professional Expertise (1.2)

Improving standards of pharmaceutical care for patients.

1.2 DELIVERY OF PROFESSIONAL EXPERTISE	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
APF competency developmental descriptors	Demonstrates accountability for delivering professional expertise and direct service provision as an individual.	Demonstrates accountability for the delivery of professional services and expertise via a team or directly to groups of patients/clients/users.	Demonstrates accountability for the delivery of professional expertise at a defined higher level. May include providing expertise and service delivery nationally or at a strategic level.
Recommended knowledge, skills, experience and behaviours	<p>Able to provide a clinical pharmacy service and deliver effective pharmaceutical care to patients with common infective pharmaceutical needs.</p> <p>Monitors prescribing quality and addresses and resolves issues identified with the appropriate member(s) of the multi-disciplinary team (MDT).</p> <p>Contributes to service development, clinical audit and evaluation of the pharmacy service for patients with infections.</p> <p>Ensures that appropriate patient documentation is maintained.</p>	<p>Responsible for the provision of a clinical pharmacy service and the delivery of effective pharmaceutical care to patients with infections and complex co-morbidities or pharmaceutical needs.</p> <p>Monitors prescribing quality and addresses and resolves any issues identified within the locality. Initiates and leads service development, clinical audit and evaluation of the pharmacy service for patients with infections.</p> <p>Actively involved in the development of medicines-related aspects of patient documentation systems.</p> <p>Advises on and manages the entry of new drugs for management of infections.</p>	<p>Advises on workforce planning and strategic direction of specialist antimicrobial pharmacy services.</p> <p>Advises on antimicrobial medicines optimisation including procurement, entry of new drugs and treatment guidelines at a network/regional/national level.</p>

Expert Professional Practice – Reasoning and Judgement (Cluster 1.3)

Improving standards of pharmaceutical care for patients.

I.3 REASONING AND JUDGEMENT	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
APF competency developmental descriptors	<p>Demonstrates ability to use skills in a range of routine situations requiring analysis or comparison of a range of options.</p> <p>Recognises priorities when problem-solving and identifies deviations from the normal pattern.</p>	<p>Demonstrates ability to use skills to make decisions in complex situations where there are several factors that require analysis, interpretation and comparison.</p> <p>Demonstrates an ability to see situations holistically.</p>	<p>Demonstrates ability to use skills to manage difficult and dynamic situations.</p> <p>Demonstrates ability to make decisions in the absence of evidence or data or when there is conflicting evidence or data.</p>
Recommended knowledge, skills, experience and behaviours	<p>Able to recognise and resolve basic problems.</p> <p>Monitors patient visits under supervision/ mentorship.</p> <p>Able to recommend justifiable courses of action.</p> <p>Demonstrates accurate reasoning.</p> <p>Able to make decisions with limited information.</p> <p>Able to make decisions in a timely manner.</p> <p>Able to prioritise problems.</p> <p>Able to assess prescriptions or work for adherence to local/national guidelines.</p> <p>Recognises own limitations and able to refer appropriately.</p>	<p>Recognises, evaluates and resolves complex problems.</p> <p>Able to appraise information, make an informed decision with the evidence available and be able to justify/defend the decision to others, including in situations where evidence is lacking.</p> <p>Recognises limitations of supporting data.</p> <p>Demonstrates an ability to see situations holistically.</p> <p>Able to take into consideration different values and views when making decisions.</p> <p>Able to refer appropriately to others within and outside own team.</p>	<p>Provides expert advice to external agencies and/or professionals on complex and novel situations.</p>

Expert Professional Practice – Professional Autonomy (Cluster I.4)

Improving standards of pharmaceutical care for patients.

I.4 PROFESSIONAL AUTONOMY	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
APF competency developmental descriptors	Is able to follow legal, ethical, professional and organisational policies/procedures and codes of conduct.	Is able to take action based on own interpretation of broad professional policies/procedures where necessary.	Is able to take action based on own interpretation of broad professional policies/procedures where necessary.
Recommended knowledge, skills, experience and behaviours	<p>Able to follow organisation guidance related to the local antimicrobial pharmacy service.</p> <p>Follows legal, ethical and organisational policy and procedures and codes of conduct.</p> <p>Contributes to the development of policies and procedures specifically for the local antimicrobial pharmacy service, under supervision.</p> <p>Able to identify areas of practice relating to antimicrobials requiring pharmaceutical input and development.</p> <p>Able to work for short periods of time in the absence of senior support.</p> <p>Demonstrates awareness and knowledge about issues relating to record keeping, confidentiality and communication (including the Data Protection Act, and Caldicott guidance).</p> <p>Demonstrates awareness and knowledge about legislation pertaining to consent.</p> <p>Demonstrates awareness and application of cultural and gender issues in specialist area, application of the principles and practices of anti-discriminatory practice.</p>	<p>Develops policies, procedures and treatment guidelines specifically for the local antimicrobial pharmacy service.</p> <p>Involved in the development and implementation supplementary/ independent prescribing in organisations where this is being developed.</p> <p>Participates in organisation or service-wide multidisciplinary groups with respect to antimicrobial pharmacy issues.</p> <p>Able to work for extended periods of time in the absence of senior support.</p>	<p>Leads on organisation-wide issues related to on antimicrobial stewardship and management of infection.</p> <p>Responsible for the application of national guidelines on antimicrobial stewardship and management of infection within the organisation.</p> <p>Accountable for clinical decision making in the management of individual and groups of patients with infections.</p>

Expert Professional Practice – Professional Autonomy (Cluster I.4)

I.4 PROFESSIONAL AUTONOMY	ADVANCED STAGE I	ADVANCED STAGE II	MASTERY
APF competency developmental descriptors	Is able to follow legal, ethical, professional and organisational policies/procedures and codes of conduct.	Is able to take action based on own interpretation of broad professional policies/procedures where necessary.	Is able to take action based on own interpretation of broad professional policies/procedures where necessary.
Recommended knowledge, skills, experience and behaviours	<p>Understands and adheres to legal frameworks including the Mental Capacity Act, Medicines Act, Controlled Drugs legislation etc.</p> <p>Understands the broad remit and powers of the mental capacity act (MCA).</p> <p>Demonstrates an understanding of the legal requirements surrounding the use of medicines as detailed in the MCA.</p> <p>Demonstrates an understanding of the issues involved, and legal stance of covert administration.</p>		

Syllabus for Advanced Infection and Antimicrobial Stewardship

This syllabus is a recommended list of the specific elements of pharmaceutical and related care that a practitioner developing towards advanced and consultant level will need to know about and apply in their practice in Infection and Antimicrobial Stewardship.

These examples are not about non-medical prescribing or administration of medicines, which falls outside the scope of this document. Their purpose is to be used as an outline intended to guide practice rather than to be a prescriptive list that has to be adhered to in all cases.

Advanced Stage I

Scope

Entry Point: Diploma in General Practice Pharmacy and Statement of Completion of General Level Framework (e.g. Band 6 (DipGPP)) or NHS Education for Scotland (NES) Stage 2 Vocational Training or appropriate proof of equivalent qualification and practice.

Completion Point: Statement of Completion of Advanced Stage I competencies (including application of knowledge during experience in the defined area of practice).

Description

Whilst working towards Advanced Stage I the aim is for practitioners to develop and deliver competent clinical care with a focus on Infection and Antimicrobial Stewardship.

The individual works towards becoming competent at delivering a clinical pharmacy service to patients with infection through experience of delivering a service to these patients.

Advanced Stage II

Scope

Entry Point: Statement of Completion of Advanced Stage I competencies with (including application of knowledge during experience in the defined area of practice).

Completion Point: Statement of Completion of Advanced Stage II competencies (including application of advanced knowledge during experience in Infection and Antimicrobial Stewardship area(s)).

Description

Whilst working towards Advanced Stage II the aim is for practitioners to continue to develop advanced knowledge and skills in order to deliver good quality clinical care to the various groups of Infection and Antimicrobial Stewardship patients. The practitioner is expected to be an integrated member of the wider multi-professional team and as such works alongside other professionals to achieve the aims of the team, leading where appropriate.

Mastery

Scope

Entry Point: Statement of Completion of Advanced Stage II competencies with (including application of knowledge during experience in the defined area of Infection and Antimicrobial Stewardship).

Completion Point: Statement of Completion of Mastery stage competencies (including application of advanced knowledge during experience in Infection and Antimicrobial Stewardship area or areas).

Description

Whilst working towards Mastery stage the aim is for practitioners to continue to develop advanced knowledge and skills in order to deliver good quality clinical care to the various groups of Infection and Antimicrobial Stewardship. The practitioner is expected to be an integrated member of the wider multi-professional team and as such works alongside other professionals to achieve the aims of the team, leading where appropriate. The practitioner will also be expected to contribute to regional and/or national antimicrobial stewardship strategy and communicate widely with a range of stakeholders working within the HAI agenda.

The following tables are the syllabus for Infection and Antimicrobial Stewardship. The final column of the table shows whether the syllabus item is expected at Advanced Stage I, Advanced Stage II or Mastery stage.

It is acknowledged that practitioners may have already covered some of this syllabus at general level and also that some practitioners may not be able to gain experience in all areas of the syllabus. Practitioners are reminded that a piece of evidence of a specific knowledge should not be resubmitted to achieve the requirements for another award as credit can only be awarded once for each piece of evidence. However, knowledge gained previously could be used in conjunction with experience to develop and demonstrate competency at Advanced Stage I, Advanced Stage II or Mastery level of the APF.

Specialist knowledge is defined here as knowledge that is specific to Infection and Antimicrobial Stewardship, and is not generally used outside this area. Generalist knowledge is defined here as common clinical pharmacy knowledge that may be pertinent to other areas of practice outside Infection and Antimicrobial Stewardship.

The sections within the syllabus are:

1. Setting the scene: Infection and Antimicrobial Stewardship in context
2. Clinical Infection Management Principles
3. Clinical Microbiology
4. Antimicrobials
5. Management of clinical syndromes (by BNF body system category)
6. Principles of an Antimicrobial Stewardship Plan

I Setting the Scene: Infection and Antimicrobial Stewardship in context		
	Specialist or Generalist	Advanced Stage I, Advanced Stage II or Mastery
Burden of infectious disease/infection		
Prevalence of infectious diseases/ infection within your own healthcare setting including key healthcare acquired infection (HCAI) rates and targets.	S	AS I
Local prevalence of infectious diseases/ infection within region including key HCAI rates.	S	AS II
National burden of infectious diseases/ infection including the national trends of HCAI.	S	M
Antimicrobial prescribing		
Importance of local monitoring of antimicrobial prescribing.	S	AS I
Local initiatives to monitor antimicrobial prescribing.	S	AS I
Relationship of local initiatives to the national antimicrobial agenda.	S	AS II
Antimicrobial resistance		
Local antimicrobial resistance patterns and their importance.	S	AS I
Antimicrobial resistance trends at regional level.	S	AS II
National antimicrobial resistance data.	S	M
Antimicrobial Stewardship		
Definition of antimicrobial stewardship (AS).	G	-
Contribution of prudent antimicrobial use to reduction of AMR.	G	-
Principles of good antimicrobial prescribing and the roles of prescribers, pharmacists and nursing staff in ensuring good practice.	G	-
Role of AS as an integral part of multi-professional interventions to prevent Healthcare Associated Infection (HAI).	S	AS I
Role of government agencies in developing antimicrobial strategy and policy.	S	AS I
National policy documents pertaining to AS and HAI.	S	AS I
Regional and national structures and relevant policy documents for HAI and AS.	S	AS I
European and global stewardship initiatives.	S	AS II
Antimicrobial Pipeline		
New antimicrobials that have been recently introduced to your organisation.	S	AS I
New antimicrobials recently introduced into the UK market and where they may fit in your healthcare setting.	S	AS II
Horizon scanning for new antimicrobials in the drug pipeline.	S	M

2 Clinical Microbiology		
	Specialist or Generalist	Advanced Stage I, Advanced Stage II or Mastery
Theory		
Common pathogens and likely sites of infection.	G	ASI
Structural and pathogenic differences between Gram negative and positive bacteria, and name common organisms in each classification.	S	ASI
Basic structure of viruses and fungi.	S	ASI
Replication of bacteria, viruses and fungi with reference to infection control.	S	ASII
Laboratory		
Common laboratory methods for culture and identification of pathogenic bacteria, fungi and viruses (including serology).	S	ASII
Interpretation of tests carried out in a laboratory and discuss limitations associated with their use.	S	ASII
Use of appropriate laboratory tests in given clinical situations.	S	M
Clinical and resistance		
Objective and subjective measures to differentiate colonisation from infection.	S	ASI
Pathogenic processes in infection and how the host defence system works.	S	ASI
Influence of bacterial structure on drug action and innate sensitivity.	S	ASI
Basic principles of antimicrobial resistance.	G	
Molecular basis of antimicrobial resistance mechanisms.	S	ASII
Mechanisms of transfer of resistance between organisms e.g. plasmids, transposons, conjugation.	S	ASII
Molecular mechanisms of transfer of resistance between organisms e.g. plasmids, transposons, conjugation.	S	M
Interventions to reduce the emergence of resistance.	S	ASI
Epidemiological methods for the surveillance of resistance.	S	ASII/M
Use of antimicrobials in agriculture and the food chain and how this may contribute to the spread of resistance.	S	M

3 Antimicrobials		
	Specialist or Generalist	Advanced Stage I, Advanced Stage II or Mastery
Theory		
Commonly-used antimicrobials for infections at various body sites.	G	
Classes and mechanisms of action for commonly-used antimicrobials.	S	ASI
Classes, mechanisms of action and molecular targets for all antimicrobials.	S	ASII
Therapeutic drug monitoring		
Basic principles of therapeutic drug monitoring for agents with a narrow therapeutic index, e.g. gentamicin and vancomycin.	G	-
Local guidance for prescribing, administration and monitoring of gentamicin and vancomycin.	G	-
Alteration of dosage regimen when antimicrobial levels are high/low.	G	
Basic principles of once-daily aminoglycoside administration.	S	ASI
Situations where once-daily aminoglycosides are inappropriate.	S	ASII
TDM of other antimicrobials e.g. teicoplanin.	S	ASII
Education of healthcare staff on use of gentamicin and vancomycin.	S	ASI

Adverse events, drug allergy and interactions		
Common adverse events e.g. allergy, toxicity associated with antimicrobials.	S	ASI
Impact of drug allergy on choice of antimicrobials and associated outcomes.	S	ASII
Interactions of antimicrobials with other medicines.	G	-
Management of common antimicrobial interactions e.g. clarithromycin.	G	-
Management of complex antimicrobial interactions.	S	ASII
Pharmacokinetics and pharmacodynamics		
Impact of renal and/or hepatic impairment on choice, dosage and monitoring of antimicrobial agents at a basic level.	G	-
Alteration of antimicrobial dosage regimen in renal and/or hepatic impairment.	S	ASI
Interpretation of antimicrobial levels and drug dosage in unstable patients.	S	ASII
Pharmacokinetic and pharmacodynamic parameters in antimicrobial use.	S	ASII
Use of PK/PD theoretical parameters to design dosage regimens.	S	M
IV-PO Switch		
Antimicrobial administration issues e.g. peripheral vs. central administration and follows local protocols for IV-oral switch.	G	-
Principles of IV-oral switch for antimicrobials.	S	ASI
Special Populations		
Antimicrobial issues in special populations (paediatrics, pregnancy, breastfeeding).	G	
Local guidelines on antimicrobial use in special populations.	S	ASI
National guidelines on antimicrobial use in special populations.	S	ASII
Monitoring requirements for use of antimicrobials in patients with liver disease.	G	-
Adverse effects on the liver of antimicrobials and how these are reported.	G	-
Antimicrobial dose adjustment in patients with renal impairment.	G	-
Specific monitoring requirements of patients with renal impairment and for antimicrobials with a high risk of renal toxicity.	G	-
Physiological and pharmacological issues which should be considered when using antimicrobials in elderly patients.	G	-
Risks and benefits of using antimicrobials in frail elderly patients, particularly in 'end of life' situations.	G	-
Issues associated with antimicrobial use in care home settings.	S	ASI
Practical, physiological and pharmacological issues which should be considered when using antimicrobials in children.	G	-
Contra-indications to use of specific antimicrobials in paediatric and neonatal practice.	G	-
Outpatient Parenteral Antimicrobial Therapy (OPAT)		
Principles of OPAT.	S	ASI
Management of OPAT patients (treatment design/ monitoring/ follow up).	S	ASII
Practicalities of development and delivery of an OPAT service.	S	ASII

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 URTI.	G	-
Evidence base supporting prudent use of antimicrobials in URTI.	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

5 Management of clinical syndromes		
	Specialist or Generalist	Advanced Stage I, Advanced Stage II or Mastery
Central nervous system		
Risk factors, clinical features and diagnosis of meningitis.	G	-
Common causative organisms for meningitis.	S	ASI
Initial management of meningitis including investigations and antimicrobial therapy.	S	ASI
Ongoing treatment options for completion of antimicrobial therapy.	S	ASII
Role of antimicrobial prophylaxis in contacts of meningitis patients.	G	-
Main viral CNS Infections and their management.	S	ASI
Use of antimicrobials in surgical prophylaxis for patients undergoing neurosurgery.	S	ASI
Obstetrics and gynaecology		
Main infections occurring during pregnancy, at delivery and post partum.	G	-
Safety issues with use of antimicrobials during pregnancy and while breastfeeding.	G	-
Main infections of the female genital tract and their management.	S	ASI
Use of antimicrobials in surgical prophylaxis for patients undergoing Caesarean section or gynaecological surgery.	S	ASI
Management of surgical site infections following Caesarean section or gynaecological surgery.	S	ASI
Urinary tract		
Symptoms and diagnosis of upper and lower urinary tract infections (UTI) in women, men and catheterised patients.	G	-
Investigations required for diagnosis of UTI and the common causative organisms.	G	-
Antimicrobial therapy of lower and upper UTI.	G	-
Evidence base for use of antimicrobials as UTI prophylaxis.	S	ASI
Care of urinary catheters to prevent catheter-associated UTI.	S	ASI
Use of antimicrobials for surgical prophylaxis in patients undergoing urological surgery.	G	-
Malignant Disease and Immunosuppression		
Aetiology, symptoms and diagnosis of neutropenic sepsis.	G	-
Initial management of neutropenic sepsis and follow up to review therapy.	G	-
Use of prophylactic antimicrobial agents in patients with cancer and those on immunosuppressive therapy.	G	-
Prophylactic antimicrobial regimens required for patients with cancer or on immunosuppressive therapy.	S	ASI
Antimicrobial prophylaxis in complex immunosuppressed patients.	S	ASII
Treatment options for immunosuppressed patients with bacterial, fungal and viral infections.	S	ASII
Blood		
Common types of bacteraemia and their management.	S	ASI
Risk factors, presentation and management of infections due to vascular disease.	S	ASI
Use of antimicrobials for surgical prophylaxis in patients undergoing vascular surgery.	S	ASI
Management of surgical site infections following vascular surgery.	S	ASI
Bones and Joints		
Risk factors and features of infection in bones or joints.	G	-
Treatment options for bone or joint infection including choice of agent, course length and monitoring required.	S	ASI
Use of antimicrobials in orthopaedic trauma.	S	ASI

Use of antimicrobials for surgical prophylaxis in patients undergoing orthopaedic surgery.	G	-
Management of surgical site infections following orthopaedic surgery.	S	ASI
Eye		
Main infections affecting the eye, their symptoms and treatment options.	G	-
Use of antimicrobials for surgical prophylaxis in patients undergoing ophthalmic surgery.	S	ASI
Management of surgical site infections following ophthalmic surgery.	S	ASI
Ear, Nose and Throat		
Main infections affecting ears, nose and throat, their symptoms and treatment options.	G	-
Main dental infections, their symptoms and treatment options.	G	-
Use of antimicrobials for surgical prophylaxis in patients undergoing ENT surgery.	S	ASI
Management of surgical site infections following ENT surgery.	S	ASI
Skin and soft tissue		
Signs and symptoms of skin and soft tissue infections (SSTIs).	G	-
Management of SSTIs including investigations, surgical intervention and antimicrobial therapy.	S	ASI
Causative organisms and potential complications of SSTIs.	S	ASI
Immunological Products and Vaccines		
Background and theory of using immunoglobulin (IG) therapy.	G	-
Role in IG therapy in managing infections in the UK.	G	-
Current UK vaccination programme and its role in preventing infection.	G	-
Use of vaccines for travel including products used and protocols for supply.	G	-
Genito-urinary and sexually transmitted infections		
Main GU infections affecting men and women and their management with antimicrobials.	G	-
Main STIs, their signs and symptoms, diagnosis and follow up required.	S	ASI
Antimicrobial treatment options for STIs and protocols for supply.	S	ASI

6 Principles of an antimicrobial stewardship programme		
	Specialist or Generalist	Advanced Stage I, Advanced Stage II or Mastery
Role of antimicrobial pharmacists and antimicrobial teams		
Roles and responsibilities of an antimicrobial pharmacist.	G	-
Role of the AMT and the different roles of the multidisciplinary team members in antimicrobial stewardship.	S	ASI
Local organisational structures for governance of AS and links between AMT and Infection Prevention Control and patient safety.	S	ASI
Regional and national networks for antimicrobial pharmacists.	S	ASI
Key components of a hospital antimicrobial stewardship programme		
Key elements of a hospital AS programme and the key references in this area.	S	ASI
Role of the antimicrobial pharmacy service in delivering AS.	S	ASI
Local AS strategy and programme of activities.	S	ASII
Regional and national AS strategy and programme of activities.	S	M
Antimicrobial stewardship in primary care		
Key issues and AS activities in primary care.	G	-
Links between the AMT and local Medicines Management teams and primary care prescribers.	S	ASI
Local primary care AS programme of activities.	S	ASII
Regional and national level primary care AS programme of activities.	S	M

Local antimicrobial guidelines and policies.	G	-
Rationale for content of guidelines and policies.	S	AS I
Development process for local policy including where evidence base is lacking.	S	AS II
Development process for national or international guidelines.	S	AS II
Surveillance of antimicrobial use and resistance		
Rationale for surveillance of antimicrobial use and resistance as an element of AS.	G	-
National and local surveillance activities for antimicrobial use and resistance.	S	AS I
European surveillance activities.	S	AS I
Quality improvement, audit and feedback		
Quality improvement methodology and commonly used models for improvement.	G	-
Use of quality improvement methodology in UK clinical practice.	G	-
Local quality improvement initiatives within AS and HAI.	S	AS I
Use of local, regional, national and international audits in AS and HAI.	S	AS I
Data collection, reporting and feedback for local AS audit activities.	S	AS I
Process for feedback of audit results to managers, clinicians and government.	S	AS II
Measuring outcomes of changes in antimicrobial use		
Methods used to measure outcomes of changes in antimicrobial use and key references.	S	AS I
Local programmes to evaluate outcomes of AS activities.	S	AS I
Regional and national programmes to evaluate outcomes of AS activities.	S	AS II
Research to develop evidence base for positive and negative outcomes of AS activities.	S	AS II
Education		
Local, regional and national education resources for AS.	S	AS I
Delivery of education on AS to healthcare staff.	S	AS I
Regional and national education resources on AS.	S	AS II
Education for undergraduate and/or postgraduate pharmacists on infection and AS.	S	AS II
Academic curricula on infection and AS for pharmacists and/or other professions.	S	M
Use of public awareness campaign such as European Antimicrobial Awareness Day and e-bug resource.	S	AS I
Local public campaigns to promote prudent antimicrobial use.	S	AS I
Regional and national campaigns to promote prudent antimicrobial use.	S	M

No part of this publication may be reproduced without written permission of the publishers, RPS Faculty.
© 2014 RPS Faculty, 1 Lambeth High Street, London, SE1 7JN.

