

ANTIMICROBIAL STEWARDSHIP

Infections that cannot be easily treated with antibiotics present a serious threat to human health across the world. In healthcare, many routine treatments and surgery depend on antibiotics to prevent the development of infections. As antibiotic resistance is encouraged by exposure to antibiotics, it is essential that these are used only when necessary. However, many factors can lead healthcare workers to prescribe antibiotics when their use may not be required.

Increasing and improving the education of healthcare professionals about antibiotics and antibiotic resistance has been highlighted as a key element of efforts to improve antibiotic use [1]. Current undergraduate healthcare professional students in the UK receive limited knowledge about antibiotics during their training, and perhaps more importantly, they do not receive any training in communication and teamwork surrounding the management of antibiotics [2]. For such reasons, a collaboration of researchers and healthcare workers from several universities and health centres across the UK led by Professor Molly Courtenay, Cardiff University, developed a competency framework for use by UK undergraduate healthcare professional students, which supports the optimal use of antibiotics.

The project, which was conducted between October and December 2017, involved selecting a group of expert lecturers, researchers, practitioners and policy-makers from across the UK, and inviting them to participate in several rounds of a voting process ('Delphi'), where an initial list of competencies identified from previous research was gradually refined until a definite set was agreed upon by all participants.

The competency framework was published in the Journal of Hospital Infection [[https://www.journalofhospitalinfection.com/article/S0195-6701\(18\)30357-8/pdf](https://www.journalofhospitalinfection.com/article/S0195-6701(18)30357-8/pdf)] in July 2018

The framework supports National Institute for Health and Care Excellence (NICE) guidance and recommendations [3] and quality statements [4]. It is aimed primarily at students to identify gaps in their knowledge, and secondarily at educators involved in undergraduate healthcare professional education to ensure antimicrobial stewardship (AMS) competencies are covered in curricula.

The framework comprises of six domains including:

- Domain 1: Infection prevention and control
- Domain 2: Antimicrobials and antimicrobial resistance

- Domain 3: The diagnosis of infection and the use of antibiotics
- Domain 4: Antimicrobial prescribing Practice
- Domain 5: Person centred care
- Domain 6: Interprofessional collaborative practice

Each Domain has an overarching competency statement (each statement represents the knowledge, skills, attitudes, and values that shape the judgements essential for AMS), and individual descriptors, designed to reflect the level of experience of the learner and type of practice setting, therefore enabling educators to easily incorporate the competencies onto any existing curricula or develop suitable resources for learners.

The competencies have been endorsed by scientific and professional societies including the Royal College of Nursing in the UK.

Future research will investigate whether experts and students around the world identify a similar set of competencies and explore any differences. Additionally, the impact of the competencies and resources developed on prescribing practice will be evaluated.

ANTIMICROBIAL STEWARDSHIP COMPETENCY FRAMEWORK

DOMAIN ONE: INFECTION PREVENTION AND CONTROL

COMPETENCY STATEMENT: All qualified health care professionals must understand the core knowledge underpinning infection prevention and control, and use this knowledge appropriately to prevent the spread of infection.

Descriptors

To support AMS learners must demonstrate infection prevention and control by:

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 & Save Lives- Clean Your Hands <http://www.who.int/gpsc/5may/en/> and the UK Governments 5-year Antimicrobial Resistance Strategy

DOMAIN TWO: ANTIMICROBIALS AND ANTIMICROBIAL RESISTANCE

COMPETENCY STATEMENT: All qualified health care professionals need to understand the core knowledge underpinning the concept of antimicrobial resistance and use this knowledge to help prevent antimicrobial resistance.

Descriptors

To support AMS learners must be able to:

1. Recognise the symptoms of infection.
2. Describe at least two different ways that antimicrobials may kill bacteria.
3. Discuss how inappropriate antimicrobial use (including non-adherence to treatment regime) may lead to antimicrobial resistance
4. Identify approaches to support optimal prescribing of antimicrobials
5. Describe at least two different ways that antimicrobials may kill bacteria

DOMAIN THREE: THE DIAGNOSIS OF INFECTION AND THE USE OF ANTIBIOTICS

COMPETENCY STATEMENT: All qualified health care professionals need to demonstrate knowledge in how infections are diagnosed and the appropriate use of antimicrobials, and use this knowledge appropriately to support the accurate diagnosis of infection and the appropriate use of antimicrobials.

Descriptors

To support AMS, learners must be able to:

1. Explain how microbiology samples may aid diagnosis of infection
2. Describe how and demonstrate (following local procedures) the appropriate taking of samples
3. Interpret microbiology results/reports from the laboratory at a basic level
4. Understand the importance of following relevant national and/or local guidelines to inform microbiological sample taking and treatment review
5. Explain why self-limiting bacterial or viral infections are unlikely to benefit from antimicrobials
6. Describe and demonstrate the self-management strategies required to treat self-limiting infections (i.e. analgesia /rest /fluids)
7. Understand the importance of following local antimicrobial policies (i.e. their development is based on local resistance patterns) and follow these policies in practice
8. Explain the importance of documenting the indications for an antimicrobial i.e. the clinical indication, the route by which it is administered, its duration, dose, dose interval, review date, and drug allergy status (taking into account NICE guidance [5]), in clinical notes, and demonstrate this in practice
9. Demonstrate an understanding of the factors that need to be considered when choosing an antimicrobial (including site of infection and type of bacteria likely to cause an infection at a particular site)
10. Describe broad spectrum and narrow spectrum antimicrobials and the contribution of broad spectrum antimicrobials to AMR
11. Present and be able to recognise the common side effects associated with commonly administered antimicrobials
12. Demonstrate an understanding of why documenting a patient allergy to an antimicrobial is important
13. Explain why it is important to consider certain physiological conditions (such as renal function) in patients who receive an antimicrobial
14. Describe what is meant by delayed prescribing
15. Explain why it is essential that an accurate diagnosis of an allergy to an antimicrobial is based on history and laboratory tests.

DOMAIN FOUR: ANTIMICROBIAL PRESCRIBING PRACTICE

COMPETENCY STATEMENT: All qualified health care professionals need to be aware of how antimicrobials are used in practice in terms of their dose, timing, duration and appropriate route of administration, and apply this knowledge as part of their routine practice as follows:

Descriptors

To support AMS, learners must be able to:

1. Explain how you would recognise and manage sepsis
2. Describe why it is important to use local guidelines to initiate prompt effective antimicrobial treatment in patients with life threatening infections
3. Describe why it is important to switch from IV antimicrobials to oral therapy
4. Describe how to switch from IV antimicrobials to oral therapy
5. Understand the appropriateness of antimicrobial administration models such as outpatient parenteral antimicrobial therapy (OPAT)
6. Demonstrate an understanding of the rationale and use of perioperative prophylactic antimicrobials to prevent surgical site infection
7. Discuss factors that can influence antimicrobial prescribing and the implications for antimicrobial stewardship programmes
8. Describe the national guidance on completion of a course of antimicrobials
9. Describe some of the medicines with which antimicrobials can sometimes interact

DOMAIN FIVE: PERSON CENTRED CARE

COMPETENCY STATEMENT: All qualified health care professionals must seek out, integrate and value as a partner the input and engagement of the patient /carer in designing and implementing care

Descriptors: To support AMS that is patient centred, learners need to:

- 1) Support participation of patients/carers, as integral partners when planning/delivering their care
- 2) Share information with patients/carers in a respectful manner and in such a way that is understandable, encourages discussion, and enhances participation in decision-making
- 3) Ensure that appropriate education and support is provided by learners to patients/carers, and others involved with their care or service;
- 4) Listen respectfully to the expressed needs of all parties in shaping and delivering care or services.
- 5) Discuss patient/carers expectations or demands of antimicrobials and the need to use antimicrobials appropriately.
- 6) Discuss with the patient/carers what they should do if their condition deteriorates (safety netting advice) or if they have problems as a result of treatment

DOMAIN SIX: INTERPROFESSIONAL COLLABORATIVE PRACTICE

COMPETENCY STATEMENT: Within the context of an AMS programme, all qualified health care professionals need to understand each other's roles, responsibilities, and

accountabilities, and how different professions collaborate in relation to how they contribute to AS.

Descriptors: To support AMS learners are able to:

- 1) Demonstrate an understanding of the roles, responsibilities, and competencies of other health professionals involved in antimicrobial treatment policy decisions.
- 2) Explain why it is important that healthcare professionals, involved in the delivery of antimicrobial therapy (including the prescription, delivery and supply), have a common understanding of antimicrobial treatment policy decisions, the quantity of antimicrobial use, and effective patient/client outcomes
- 3) Establish collaborative communication principles and actively listen to other professionals and patients/carer involved in the delivery of antimicrobial therapy
- 4) Communicate effectively to ensure common understanding of care decisions
- 5) Develop trusting relationships with patients /carer and other health/social care professionals
- 6) Effectively use information and communication technology to improve interprofessional patient-centred care

References

1. WHO. Global action plan on antimicrobial resistance, 2016 http://apps.who.int/iris/bitstream/10665/193736/1/9789241509763_eng.pdf?ua=1
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3. NICE (2015). Antimicrobial stewardship: systems and processes for effective antimicrobial medicines use. <https://www.nice.org.uk/guidance/ng15/chapter/2-Implementation-getting-started>
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The competencies have been endorsed by scientific and professional societies including the Royal College of Nursing, the Royal College of General Practitioners, the College of Podiatry, and the Association of Chartered Physiotherapists in Respiratory Care.

