

Tackling antimicrobial resistance: the role of formative assessments



August 2018

Developing people
for health and
healthcare

www.hee.nhs.uk

Introduction

Formative assessments are designed to provide learners with feedback on progress and informs development but does not contribute to the overall assessment.

Traditional methods to assess knowledge use the ‘teach and then assess’ approach. This method focuses on individuals identifying what has been learned only after the assessment has been completed (and graded) i.e. an example of this type of summative assessment would be an end of unit exam.

For more student centred and personalised learning environments, we need to move beyond assessing to determine knowledge and move into assessing as part of the learning process. This formative assessment can give students an immediate feedback loop that enhances learning.^{1,2,3} Online formative assessments have been used successfully in health student training.^{4,5,6,}

Formative assessments should:

- Inform knowledge
- Inform and redirect practice
- Provide immediate feedback to learners
- Occur frequently
- Provide useful data
- Be ongoing and embedded
- Include formal and informal assessments of knowledge

Background

Health Education England has surveyed the inclusion of [competencies](#) developed by the Government’s expert advisory committee on Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) and Public Health England (PHE) [into health professional curricula](#) and the [education approaches for the responsible prescribing of antimicrobials](#).

Within both these reports we made a recommendation that HEE will explore the feasibility of an individualised online formative assessment tool for health students and health professionals to support learning on infection prevention and control (IPC) and antimicrobial resistance (AMR) and stewardship (AMS).

¹ Hanson et al (2001). Developing a methodology for online feedback and assessment. Proceedings of the 5th CAA Conference, Loughborough: [Loughborough University](#).

² The Open University. Promoting learning with instant feedback. [Webpage](#).

³ Centre for Educational Research and Innovation. Assessment for learning formative assessment. [OECD/CERI International Conference “Learning in the 21st Century: Research, Innovation and Policy”](#)

⁴ Velan et al (2008). Integrated online formative assessments in the biomedical sciences for medical students: benefits for learning. [BMC Medical Education](#); 8:52.

⁵ Marden et al (2013). Online feedback assessments in physiology: effects on students’ learning experiences and outcomes. [Adv Physiol Educ](#); 37: 192–200.

⁶ Bijol et al (2015). Medical student web-based formative assessment tool for renal pathology. [Medical Education Online](#), 20:1.

Why?

A key area for the [UK AMR Strategy 2013 to 2018](#) is to improve professional education and training to improve clinical practice and promote wider understanding of the need for more sustainable use of antibiotics. This to improve infection prevention and control practices and optimise prescribing practice and more needs to be done to build clinical capability and deliver effective antimicrobial stewardship. HEE has a [mandate](#) objective to explore improvements in the education and training of healthcare workers to ensure that antimicrobial stewardship and good infection prevention and control practices are embedded across the health and care systems.

Longer term outcome

A comprehensive tool to ensure system wide understanding of AMR and IPC competencies and the promotion of standard learning materials.

Methodology

This work to explore the need and feasibility for a formative assessment was divided in four stages:

Stage 1: Engage professional organisations/bodies/societies and royal colleges via an online survey to:

- identify training materials available on AMR and/or IPC and/or AMS that individual professional organisations/bodies/societies and royal colleges have developed, supported, commissioned, hosted or recommended – this could include sessions on the management of specific infections.
- identify those sessions that have been incorporated into healthcare professional training (for example work on [sexually transmitted infections](#)) and linked relevant professional standards (for example [Professional Standards or Public Health Practice for Pharmacy](#) that includes AMR) or those linked to the [PHE/ARHAI AMR competencies](#). The context for this includes initial education, structured postgraduate training and/or CPD.
- Identify a named contact who could help support discussions around the feasibility of developing an individualised online formative assessment tool on AMR and/or IPC and/or AMS.

Stage 2: Identify sessions that could be added to the HEE AMR [guide to training resources](#) and seek endorsement of this guide from individual professional organisations/bodies/societies and royal colleges. The purpose of developing this guide is to signpost healthcare workers to learning materials currently available in the system on AMR/IPC/AMS that could help support their learning and development in this area. The learning sessions in this guide can then be linked to individual questions developed as part of the online formative assessment to help healthcare workers address any knowledge gaps they may have on AMR/IPC/AMS?

Stage 3: Set up a stakeholder group consisting of members from individual professional organisations/bodies/societies and royal colleges to scope the feasibility and development of an online formative assessment tool.

Stage 4: Build the individualised online formative assessment tool. Launch and promote to the system via other arm's length bodies (ALBs) and stakeholders.

The outcomes from this report are specific to stage 3, where we invited all of those that contributed to our survey (stage 1), to a workshop where further questions were explored to scope the feasibility and development of an online formative assessment tool (workshop responses can be found in the Appendix).

Conclusions

A number of learning resources are already available for different professional groups around antimicrobial resistance and stewardship and infection prevention and control (details in the Appendix below). Most professional groups do not have formal assessment processes to support learning on AMR/IPC/AMS. An individualised assessment on AMR would be a valuable asset targeted towards post-registration trainees and embedded within current training pathways, delivery training/standards, CPD, appraisal and revalidation mechanisms. However, the term 'individualised' needs defining with a clear scope on whether individuals or professional groups will be targeted in different working environments and stages in their career. In addition, standards need to be set first supported by an evidence base that underpins the assessment process. The assessment needs to be linked to outcomes described within national strategies with defined outcome measures based on clinical case based scenarios of the patient journey covering both health and social care and targeting all staff groups. Barriers include confusion on the role of antimicrobial stewardship definitions and issues in aligning standards that are not common or understood for the wider multidisciplinary team. A framework could be developed, that would be drawn from professional bodies with associated learning and assessment outcomes involving user based research on the best approach of an assessment and patient scenarios. This should also consider individual and organisational levers that will support uptake and improvements in outcomes.

Next steps

HEE will consider outcomes from this work with our recently published [report](#) exploring what helps and hinders awareness raising and behaviour change on AMR, that will inform the future direction of our antimicrobial resistance and sepsis programme.

Acknowledgements

British Infection Association (BIA).
British Association for Sexual Health and HIV (BAASH).
British Dentistry Associations (BDA).
British Pharmacological Society (BPS).
British Society of Antimicrobial Chemotherapy (BSAC).
e-Learning for Healthcare (eLH).
Faculty of Dental Surgery, Royal College of Surgeons (RCS) of England.
Medical Schools Council (MSC).
Public Health England (PHE).
Royal College of Nursing (RCN).
Royal Pharmaceutical Society (RPS).
United Kingdom Clinical Pharmacy Association (UKCPA).

Appendix

A workshop was held on March 23rd 2018, where we invited all of those who contributed to our survey, where they expressed an interest in being involved in further discussions. We asked those that attended:

What is already being done

Dentistry – Faculty of Dental Surgery (FDS) Royal College of Surgeons (RCS) of England, The Faculty of General Dental Practice FGDP (UK), British Association of Oral Surgeons (BAOS), Association of Clinical Oral Microbiologists (ACOM)

The BAOS, with support from FGDP and ACOM, has developed a stewardship scenario based e-learning package that tests stewardship knowledge and appropriate prescribing. Some scenarios and questions on patient management are also built in. The package consists of 3 modules of 10 scenarios covering a range of common dental presentations. The learning is available to all dentists at all levels and uses a formative assessment approach. If participants achieve over 80%, they get a certificate of completion and CPD points. Learners are given feedback for each question at the point of answering for both right and wrong answers where the correct answer provides the scientific evidence and the wrong answers highlight the lack of information or evidence for the wrong answers. There is continued interest in the training as regulators are interested in pursuing inappropriate prescribing, particularly in primary care. Scenario learning forms part of audit assessments. FDS is responsible for ensuring AMS Dental educational material on e-Den, part of e-Learning for Healthcare, is up to date.

British Pharmacological Society (BPS) – Prescribing Safety Assessment (PSA)

The BPS works in partnership with the Medical Schools Council to deliver the online Prescribing Safety Assessment. 8,000-8,500 candidates sit the PSA year. The PSA is a valid and reliable assessment that allows final year medical students to demonstrate that they have the necessary knowledge, skills and judgement (in relation to the safe and effective use of medicines) to begin

A survey of prescriber education and training on antimicrobial resistance

their work as independent junior prescribers in UK hospitals. It is supported by the General Medical Council and the Foundation Programme Board to the extent that all new entrants will be expected to have passed it to enter training as a doctor in the UK whether they come from UK medical schools or from overseas. With HEE support the assessment has been piloted with pharmacists for the last two years. AMR is one of 5 high risk drug areas and forms 2 out of 60 assessment topics. The BPS is delivering the PSA to other prescribing groups within the UK and internationally as a formative training tool, including as part of CPD. It is available in Canada, Australia, NZ, Ireland, Malta, and with pilots taking place in 2018 in the Middle East, India, China and Europe in 2018. As one would expect AMR features very highly in this international engagement.

BASHH - British Association for Sexual Health and HIV

In Sexual Health and HIV there is less emphasis on antimicrobial stewardship (AMS) as antiretroviral therapy is guideline driven. Clinician prescribing is based on national guidelines and recommendations are evaluated via audits in practice, for example national audits have taken place for AMR in Gonorrhoea. It is important that clinicians working in isolation are provided with decision making tools to support their practice that are easily accessible. The 'bacterial specialist interest group' (BSIG) of BASHH is developing a web-based and App training resource on sampling and diagnostic methods for sexually transmitted infections (STIs) including the use of microscopy for doctors and nurses. There is not a formal mechanism for assessment of knowledge via revalidation.

RCN – Royal College of Nursing

RCN do not set formal standards; this is done by NMC. There are changes to nursing standards and pre-registration nursing curricula as there will be more prescribing nurses in the future. In pre-registration nursing, there is increasing pressure to ensure that trainees are competent to prescribe. Infection prevention and control (IPC) features across the broad scope of standards and curricula. A foundation module on IPC is available however antimicrobial stewardship (AMS) is linked to specialist training. A foundation module is available for care assistants on IPC. Antimicrobial stewardship (AMS) is not currently defined as within nursing there is no clear definition for this, which is causing confusion around differing priorities. AMR & AMS is included within advanced nursing practice as part of their prescribing portfolio assessment. They then need further evidence and undertake an assessment that is demonstrated against the standards.

BIA – British Infection Association

There is no training package for AMR competencies for allied professionals. There is an eLearning for Healthcare (eLfH) package available as part of the safer prescribing programme. WHO is currently looking to develop a curriculum, however it will not be mandated. There is a focus on AMS for clinical scientists, virologists and microbiologists. As part of the microbiology curriculum, registrars have a competency framework on stewardship.

BSAC - British Society of Antimicrobial Chemotherapy

BSAC has recently launched an [e-book](#) on AMR and AMS to complement the freely available 'massive open online course' (MOOC) on [antimicrobial stewardship](#). Further MOOCs are also available on [point prevalence surveys](#) and [gram negative bacteria](#). An [antimicrobial resource centre](#) (ARC) has been developed as a global repository of information for all people interested in the effective management of infectious diseases.

Pharmacy – Royal Pharmaceutical Society (RPS) and United Kingdom Clinical Pharmacy Association (UKCPA)

Training material for pharmacists is available through a dedicated AMR and AMS [webpage](#). An expert professional practice [curriculum](#) is available for all pharmacists. Assessments have not been mandated and competency is assessed as part of the appraisal process.

Workshop questions:

Three groups were asked the following questions to probe debate to explore developing an individualised assessment tool on AMR. This is a summary of responses.

Question 1:

Should we develop an individualised assessment (formative or summative) for the current and future health workforce?

- There was general agreement that an individualised assessment on AMR would be a valuable asset.
- Summative assessment was suggested for pre-registration/undergraduate trainees. Another comment suggested that undergraduate assessments are sound and do not need much development.
- Formative assessment was suggested for post-registration trainees.
- There is a perceived need for an assessment to be adaptable to current appraisal and revalidation mechanisms.
- In terms of promotion and system buy in - a question was raised in considering certification to act as an incentive to those undertaking the assessment. Evidence on assessments raising educational standards was also suggested
- Consideration and integration of continuous professional development (CPD), and its' associated funding was also mentioned. Antimicrobial stewardship is important to consider as an overarching theme and how this relates to CPD. IPC mandatory stewardship was also highlighted.
- In terms of development - core principles (common standards) were considered easy to implement, whilst clinical scenarios would be more relevant, yet could be harder to achieve.
- In terms of a multidisciplinary approach, there could be an issue in aligning standards that are not common or understood.

Scope

- A wide scope of the assessment was suggested, covering infections – IPC, diagnosis, sepsis and antimicrobial use / review.
- There is a perceived need to define the term ‘individualised’ and whether the scope would be towards a particular individual or a professional group, professional environment, stage of career. Within this it was suggested to filter for staff groups - clinical, managerial, trainers.
- Using case based scenarios was suggested, with the consideration of a patient journey, from primary to secondary care, that could be utilised by all staff groups such as care homes, community, GP and hospital. Scenario based learning is already available and could be easy to adapt. An importance was raised on focussing on the whole staff group and not just prescribers.
- Patient centred care is a key factor to consider.
- It was suggested that a framework may need to be developed, that would be drawn from professional bodies with associated learning and assessment outcomes.

Question 2:

What opportunities will help support the development and embedding of individualised assessments (formative or summative)?

a. Can this be embedded in current training pathways?

- In hospital – it could be possible to extend statutory and mandatory training for staff on a yearly or biannually basis, if the content was universal. IPC mandatory training was suggested as the most likely to utilise. It was further suggested that IPC mandatory training could be renamed, or changed to accommodate a formative assessment. It was also noted that there is a perceived issue around mandatory training that can be viewed negatively, which should be considered in any of this type of development.
- [Core Skills Framework](#) was suggested to be mapped against an assessment and where it could sit in IPC mandatory training.
- Certificate of completion of training ([CCT](#)) relevant to speciality training (medical curriculum embedded).
- The Health and Social Care Act ([2008](#)) code of practice on the prevention and control of infections and related guidance and regulatory mechanisms via the CQC.

b. How will this be developed?

- It was suggested that the best development of the assessment would be a blend of classroom and e-learning options. A distinction could be made between delivering the training and what the assessment tool looks like.
- It would be important to start with standards first, then assess knowledge. There is the need to talk about the evidence base. Quality and measures need to be linked to the strategy.
- There would need to be a way to assure AMR knowledge, attitude and behaviours in practise.

A survey of prescriber education and training on antimicrobial resistance

- A general suggestion was made to consult with healthcare workers to ascertain the best approach of an assessment and whether a specialised clinical scenario would be preferred to a generalised situation.
- An example approach suggested for development, was to choose a current focus area, such as gram negative bacteraemia, with a specific workforce, run a pilot, then consider to scale this out, informing the evidence base of the most suitable type of assessment.
- Link to the national AMR strategy.

c. System buy in

- For an assessment to be successful, it was suggested that ample time be allocated for those undertaking it, whether allotted study time, CPD hours.
- For development consideration – a ground up approach was suggested, involving user research based on government digital service (GDS) [standards](#). It could be possible to use existing tools e.g. PSA and could be embedded into curricula. For medics, it could be linked to CCT. For nursing, it was suggested that mandatory training could be utilised and specialist areas of practice could be linked to NMC standards. For dentistry, it could be linked to CPD.
- It is important for organisations to feel that the assessment would fill perceived gaps in AMR training.

d. Levers

- For health professionals this could be embedded within training pathways, delivery training/standards were considered along with CPD and revalidation.
- System embedding could utilise organisational levers and quality levers. However, standards need to be set first supported by an evidence base then knowledge assessed. The assessment needs to be linked to outcomes described within national strategies with defined outcome measures. This can then be embedded via revalidation/recertification, CPD, commissioning for quality and innovation (CQUIN) or another comparable payment system like a quality premium. There could also be alignment with regulations at a system level, like NICE guidance and standards for stewardship. It could also be utilised for organisational audits that link with NICE, CQUINs and government legislation were considered.

Population Health and Prevention - Antimicrobial Resistance and Sepsis team

Health Education England

Stewart House

Russell Square

London

WC1B 5DN

php@hee.nhs.uk