

Antimicrobial stewardship

Learning outcomes for antimicrobial resistance teaching

Courses supporting student-led initiatives

Courses should provide the following.

Professionalism

- An appreciation of antimicrobials as a valuable resource
- An understanding of legislative and regulatory requirements and guidelines to prevent antimicrobial resistance including:
 - The legislative framework that regulates antimicrobial prescribing
 - The prescribing ‘cascade’, intending to protect the food chain, avoid residues and observe withdrawal periods following treatment
 - Current relevant National Action Plans for antimicrobial resistance
 - Assurance schemes that promote good practice in antimicrobial prescribing
- Awareness of existing databases which allow vets and farmers to centrally support or challenge any poor antimicrobial prescribing practices, in terms of client and practice behaviour and the impact of incorrect usage on antimicrobial resistance, including the support of reflective practice.
- Training in communication to clients the importance of good prescribing in reducing antimicrobial resistance, describing alternative approaches and emphasizing the role of diagnostics.

Policies

- Awareness that antimicrobial use guidelines developed by individual organisations and consortiums are important, influential and different. Gov.uk has an 'AMR Collection' page which contains up-to-date links to guidance, policies and resources for awareness of antimicrobial stewardship policies, including those from the Responsible Use of Medicines in Agriculture (RUMA) Alliance, Red Tractor Farm Assurance, British Veterinary Association, British Equine Veterinary Association, British Small Animal Veterinary Association, Pig Veterinary Society and British Cattle Veterinary Association. Students should be aware of national action plans, such as the [Irish National Action Plan \(iNAP\)](#), and the [UK five-year National Action Plan and 20-year vision](#).
- Understanding of the principles and benefits of an annual antimicrobial usage and infection control audit.
- Training in/understanding of how to (i) formulate antimicrobial stewardship policies (or adapt existing policies) for use in practice and (ii) utilise simple methods for monitoring antimicrobial use at practice level.

Underpinning knowledge for antimicrobial resistance

Underpinning knowledge should include the following.

- Mechanisms of action and pharmacokinetics of different antimicrobial groups
- Biosecurity and infection control
- Mechanisms of resistance
- Assessment of resistance
- The co-selection of antimicrobial resistance
- The origin of transfer of resistance
- Clinical relevance of resistance
- 'One Health' and the impact of animal antimicrobial usage on antimicrobial resistance in humans (and vice versa) as well as animal and environmental health.
- Collection of appropriate sampling and interpretation of microbiological diagnostic test results, including antimicrobial susceptibility tests.
- Ability to distinguish situations in which antimicrobial treatment is warranted from those in which other approaches are appropriate.

- Reduction of antimicrobial use through disease prevention strategies such as good animal husbandry, hygiene, prevention (vaccination, etc.) and control of infections and biosecurity.
- Optimising treatment through establishing a clear diagnosis (including antibiogram) prior to prescription where possible. Understanding the use of delayed prescriptions, de-escalation of treatment, diagnostic tests and other methods as appropriate.