ESCMID generic competencies in antimicrobial stewardship and prescribing

Introduction
This document contains a set of generic competencies in antimicrobial prescribing and stewardship which is the result of a structured consensus procedure including a multidisciplinary expert panel from 24 European countries. These competencies are intended to be relevant for all independent prescribers in Europe. These are generic competencies, and so they can be further adapted by all prescribing professional groups.

There are other important competencies that are relevant for antimicrobial prescribers and stewards, such as competencies in infection prevention and control, public health, and the use of vaccines. However, competencies were only considered for inclusion if they were focused on the domains of antimicrobial prescribing and stewardship. It is essential that these other competencies are also considered in any strategy to help curb the emergence and spread of antimicrobial resistance, and so preserve the use of our antimicrobials.

Guiding definitions for developing competencies set:
• Competencies are the minimum standards that all independent prescribers of antimicrobials should reach to practise according to the principles of responsible antibiotic use
• An independent prescriber is in general an unsupervised and unrestricted prescriber, although specific prescribing rules vary from country to country

Prescribers are considered to be competent if they demonstrate their understanding, for example through using the specific knowledge or skill when prescribing an antibiotic.

Section 1: Core concepts in microbiology, pathogenesis and diagnosing infections

1. Every independent prescriber must understand:
   1.1. The nature and classification of micro-organisms that commonly cause infections in humans
   1.2. The common microbiological aetiology of human infections, and the ways in which micro-organisms are commonly acquired in community and hospital settings
   1.3. The differences between colonisation (e.g. isolation of bacteria from a venous leg ulcer with no signs of inflammation) and infection
   1.4. That an inflammatory response can be due to both infectious and non-infectious causes (e.g. acute pancreatitis)

2. Every independent prescriber must know how to:
   2.1. Take a thorough history and perform a physical examination to diagnose common infections and to assess their severity
   2.2. Use and interpret investigations that can help in informing diagnosis of an infection and in monitoring the response to treatment (e.g. microbiological investigations, biomarkers, point-of-care tests)
Section 2: Antimicrobial prescribing

1. Every independent prescriber must understand:
   1.1. How and where to access relevant guidance on antimicrobial prescribing and stewardship
   1.2. When not to prescribe antimicrobials (e.g. antibiotics for viral infections, or when there is bacterial colonisation)
   1.3. That best practices for some infections may not include antimicrobial treatment (e.g. incision and drainage of abscesses, removal of foreign material)

2. Every independent prescriber must understand how to select the appropriate antimicrobial, using relevant guidance when possible, as well as the key elements of initiating prescribing an antimicrobial:
   • obtaining relevant microbiological cultures or relevant tests before commencing treatment
   • the timing of antimicrobial administration in different situations (e.g. as soon as possible for life-threatening infections, less urgently for chronic bone infections)
   • the choice and dose of agent, and the route of administration
   • the duration of treatment, review dates and stop dates

3. Every independent prescriber must understand the key elements of continuing and rationalizing antimicrobial therapy:
   • monitoring antimicrobial levels when indicated, and adjusting doses (e.g. for patients with renal impairment)
   • changing antibiotics according to microbiology results and clinical condition, ideally to a narrower spectrum (de-escalation) or if needed to a broader spectrum (escalation)
   • reviewing antibiotic therapy at 48 to 72h and regularly thereafter in hospitalised patients, and in appropriate situations in the community
   • switching antibiotics from intravenous to oral administration as soon as possible when indicated (according to guidelines)
   • stopping antimicrobials if there is no evidence of infection based on clinical findings and investigations (e.g. negative microbial cultures, imaging reports)

4. Every independent prescriber must understand the need to document the important details of the antimicrobial treatment plan (e.g. agent, dosing, administration route, clinical indication, duration and review dates) in the prescription chart, medical records and transfer notes to other healthcare institutions

5. Every independent prescriber must understand:
   5.1. That empirical treatment should be guided by local antimicrobial susceptibility patterns
5.2. The clinically relevant spectrum of activity for commonly prescribed antimicrobials
5.3. The basic principles of pharmacokinetics and pharmacodynamics

6. When prescribing an antimicrobial, every independent prescriber must know:
   6.1. The antimicrobial class that the agent belongs to, and the contraindications to its use
   6.2. The name and class of antimicrobial being prescribed, if prescribing by trade name

7. Every independent prescriber must understand single prophylactic dosing for surgical and other procedures for which prophylaxis has been shown to be effective, and that additional prophylactic antimicrobial doses can occasionally be needed (e.g. when the duration of the operation/procedure is prolonged).

8. Every independent prescriber must know:
   8.1. Common antimicrobial and drug/food interactions
   8.2. Common side-effects of antimicrobials, including allergy, how to monitor for them, and what to do when they are suspected (e.g. documenting allergic reactions in patient records, reporting side-effects)

9. Every independent prescriber must understand any legal requirements for prescribing antimicrobials in their country, and comply with these when prescribing

Section 3: Antimicrobial stewardship

1. Every independent prescriber must understand that:
   1.1. Antimicrobials need to be used responsibly to prevent the emergence and spread of antimicrobial resistance
   1.2. Optimising antimicrobial use can limit the common side effects and collateral damage related to treatment (e.g. their disruptive effects on the normal host flora, which may lead to Clostridium difficile infection, super-infection with Candida spp.)
   1.3. It is important to avoid unnecessary uses of antimicrobials, especially those with a broad spectrum
   1.4. Transmission of micro-organisms in community and hospital settings can significantly amplify antimicrobial resistance

2. Every independent prescriber must understand local stewardship policies based on national (or international where these do not exist) evidence-based guidelines

3. Every independent prescriber must understand and engage with any locally or nationally agreed quality measures for assessing antimicrobial prescriptions (e.g. compliance with
4. Every independent prescriber must know how to communicate with patients and their carers, nurses, pharmacists and other healthcare professionals about:
   4.1. When antimicrobials are not needed
   4.2. Complying with the duration and frequency of administration of their prescribed antimicrobials

5. Every independent prescriber must recognise that it is a duty of care to co-operate with others more expert than oneself, such as the antimicrobial stewardship team, when such expertise is needed