NICE
National Institute for
Health and Care Excellence

Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use

NICE guideline

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Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

> This guideline is the basis of QS121.

Overview

This guideline covers the effective use of antimicrobials (including antibiotics) in children, young people and adults. It aims to change prescribing practice to help slow the emergence of antimicrobial resistance and ensure that antimicrobials remain an effective treatment for infection.

Who is it for?

- Health and social care practitioners

- Organisations commissioning, providing or supporting the provision of care

- People who are taking antimicrobials and their families and carers.

What is this guideline about and who is it for?

Purpose of this guideline

The purpose of this guideline is to provide good practice recommendations on systems and processes for the effective use of antimicrobials.

Audience for this guideline

- Health and social care practitioners (a term used to define the wider care team of hospital staff [including microbiologists and infection control staff], community matrons and case managers, GPs, dentists, podiatrists, pharmacists and community nurses [including those staff working in out-of-hours services], domiciliary care workers and care home staff [registered nurses and social care practitioners working in care homes], social workers and case managers).

- Organisations commissioning (for example, clinical commissioning groups or local authorities), providing or supporting the provision of care (for example, national or professional bodies, directors of public health, health and wellbeing boards, healthcare trusts and locum agencies).

- Adults, young people and children (including neonates) using antimicrobials or those caring for these groups. This includes people and organisations involved with the prescribing and management of antimicrobials in health and social care settings.

- The guideline may also be relevant to individual people and organisations delivering non-NHS healthcare services, and to other devolved administrations.

It is anticipated that health and social care providers and commissioners of services will need to work together to ensure that patients benefit from the good practice recommendations in this guideline.

Scope of this guideline

The guideline covers the effective use of antimicrobials as part of all publicly funded health and social care commissioned or provided by NHS organisations, local authorities (in England), independent organisations or independent contractors.

The guideline may also be relevant to care delivered by non-NHS healthcare services, and to other devolved administrations.

The guideline does not cover:

- specific clinical conditions (although some evidence identified included patients with a specific infection such as community acquired pneumonia)

- named medicines

- public health awareness of antimicrobial resistance

- research into new antimicrobials

- immunisation and vaccination

- antimicrobial household cleaning products

- antimicrobial use in animals

- hand hygiene, decolonisation and infection prevention and control measures

- medicines adherence, except where there are specific issues for health and social care practitioners to address relating to antimicrobials

- access to medicines, including local decision-making for medicines not included on local formularies

- medicines shortages, including supply issues and discontinued medicines

- prescription charges

- waste medicines.

All NICE guidelines are developed in accordance with the NICE equality scheme.

Person-centred care

This guideline offers best practice advice on the effective use of antimicrobial medicines.

Patients and health professionals have rights and responsibilities as set out in the NHS Constitution for England – all NICE guidance is written to reflect these. Treatment and care should take into account individual needs and preferences. Patients should have the opportunity to make informed decisions about their care and treatment, in partnership with their health professionals. If the person is under 16, their family or carers should also be given information and support to help the child or young person to make decisions about their treatment. If it is clear that the child or young person fully understands the treatment and does not want their family or carers to be involved, they can give their own consent. Health professionals should follow the Department of Health's advice on consent. If a person does not have capacity to make decisions, health and social care practitioners should follow the code of practice that accompanies the Mental Capacity Act and the supplementary code of practice on deprivation of liberty safeguards.

NICE has produced guidance on the components of good patient experience in adult NHS services. All health professionals should follow the recommendations in NICE's guideline on patient experience in adult NHS services. In addition, all health and social care practitioners working with people using adult NHS mental health services should follow the recommendations in NICE's guideline on service user experience in adult mental health. If a young person is moving between paediatric and adult services, care should be planned and managed according to the best practice guidance described in the Department of Health's Transition: getting it right for young people. Adult and paediatric healthcare teams should work jointly to provide assessment and services to young people and diagnosis and management should be reviewed throughout the transition process. There should be clarity about who is the lead clinician to ensure continuity of care.

1 Recommendations

The following guidance is based on the best available evidence. The underline full guideline gives details of the methods and the evidence used to develop the guidance.

> The wording used in the recommendations in this guideline (for example, words such as 'offer' and 'consider') denotes the certainty with which the recommendation is made (the strength of the recommendation). See how we develop NICE guidelines for more details.
>
> This guideline should be read in conjunction with NICE's guideline on antimicrobial stewardship: changing risk-related behaviours in the general population and the NICE guidance on managing common infections.

Terms used in this guideline

Antimicrobial stewardship

The term 'antimicrobial stewardship' is defined as 'an organisational or healthcare-system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness'.

Antimicrobial resistance

The term 'antimicrobial resistance' is defined as the 'loss of effectiveness of any anti-infective medicine, including antiviral, antifungal, antibacterial and antiparasitic medicines'.

Antimicrobials and antimicrobial medicines

The term 'antimicrobials' and 'antimicrobial medicines' includes all anti-infective therapies, (antiviral, antifungal, antibacterial and antiparasitic medicines) and all formulations (oral, parenteral and topical agents).

Organisations

The term 'organisations' (also known as the 'service') is used to include all commissioners (clinical commissioning groups and local authorities) and providers (hospitals, GPs, out-of-hours services,

dentists and social enterprises) of health or social care services, unless specified otherwise. Occasionally, in order to make a recommendation more specific to the intended care setting, the setting is specified; for example, the recommendation will state 'hospital'.

Health and social care practitioners

The term 'health and social care practitioners' is used to define the wider care team, including but not limited to, case managers, care coordinators, GPs, hospital doctors, microbiologists, pharmacists, nurses and social workers.

1.1   All antimicrobials

Recommendations for organisations (commissioners and providers)

Antimicrobial stewardship programmes

1.1.1   Commissioners should ensure that antimicrobial stewardship operates across all care settings as part of an antimicrobial stewardship programme.

1.1.2   Establish an antimicrobial stewardship programme, taking account of the resources needed to support antimicrobial stewardship across all care settings.

1.1.3   Consider including the following in an antimicrobial stewardship programme:

- monitoring and evaluating antimicrobial prescribing and how this relates to local resistance patterns

- providing regular feedback to individual prescribers in all care settings about:

  — their antimicrobial prescribing, for example, by using professional regulatory numbers for prescribing as well as prescriber (cost centre) codes

  — patient safety incidents related to antimicrobial use, including hospital admissions for potentially avoidable life-threatening infections, infections with *Clostridium difficile* or adverse drug reactions such as anaphylaxis

- providing education and training to health and social care practitioners about antimicrobial stewardship and antimicrobial resistance

- integrating audit into existing quality improvement programmes.

1.1.4   Ensure that roles, responsibilities and accountabilities are clearly defined within an antimicrobial stewardship programme.

1.1.5   Involve lead health and social care practitioners in establishing processes for developing, reviewing, updating and implementing local antimicrobial guidelines in line with national guidance and informed by local prescribing data and resistance patterns.

1.1.6   Consider developing systems and processes for providing regular updates (at least every year) to individual prescribers and prescribing leads on:

- individual prescribing benchmarked against local and national antimicrobial prescribing rates and trends

- local and national antimicrobial resistance rates and trends

- patient safety incidents related to antimicrobial use, including hospital admissions for potentially avoidable life-threatening infections, infections with *C. difficile* or adverse drug reactions such as anaphylaxis.

1.1.7   Consider developing systems and processes for identifying and reviewing whether hospital admissions are linked to previous prescribing decisions in patients with potentially avoidable infections (for example, *Escherichia coli* bacteraemias, mastoiditis, pyelonephritis, empyema, quinsy or brain abscess).

Antimicrobial stewardship teams

1.1.8   <u>Organisations</u> establishing antimicrobial stewardship teams should ensure that the team has core members (including an antimicrobial pharmacist and a medical microbiologist) and can co-opt additional members depending on the care setting and the antimicrobial issue being considered.

1.1.9   Support antimicrobial stewardship teams, by developing processes that promote antimicrobial stewardship or by allocating resources, to:

- review prescribing and resistance data and identify ways of feeding this information back to prescribers in all care settings

- promote education for prescribers in all care settings

- assist the local formulary decision-making group with recommendations about new antimicrobials

- update local formulary and prescribing guidance

- work with prescribers to explore the reasons for very high, increasing or very low volumes of antimicrobial prescribing, or use of antimicrobials not recommended in local (where available) or national guidelines

- provide feedback and advice to prescribers who prescribe antimicrobials outside of local guidelines when it is not justified.

Antimicrobial stewardship interventions

1.1.10   Consider using the following antimicrobial stewardship interventions:

- review of prescribing by antimicrobial stewardship teams to explore the reasons for increasing, very high or very low volumes of antimicrobial prescribing, or use of antimicrobials not recommended in local (where available) or national guidelines

- promotion of antimicrobials recommended in local (where available) or national guidelines

- IT or decision support systems

- education-based programmes for health and social care practitioners, (for example, academic detailing, clinical education or educational outreach).

1.1.11   Consider providing IT or decision support systems that prescribers can use to decide:

- whether to prescribe an antimicrobial or not, particularly when antimicrobials are frequently prescribed for a condition but may not be the best option

- whether alternatives to immediate antimicrobial prescribing may be appropriate (for example, back-up [delayed] prescribing or early review if concerns arise).

1.1.12   Consider developing systems and processes to ensure that the following information is provided when a patient's care is transferred to another care setting:

- information about current or recent antimicrobial use

- information about when a current antimicrobial course should be reviewed

- information about who a patient should contact, and when, if they have concerns about infection.

1.1.13   Consider prioritising the monitoring of antimicrobial resistance, to support antimicrobial stewardship across all care settings, taking into account the resources and programmes needed.

1.1.14   Consider supplying antimicrobials in pack sizes that correspond to local (where available) and national guidelines on course lengths.

1.1.15   Consider evaluating the effectiveness of antimicrobial stewardship interventions by reviewing rates and trends of antimicrobial prescribing and resistance.

Communication

1.1.16   Encourage and support prescribers only to prescribe antimicrobials when this is clinically appropriate.

1.1.17   Encourage health and social care practitioners across all care settings to work together to support antimicrobial stewardship by:

- communicating and sharing consistent messages about antimicrobial use

- sharing learning and experiences about antimicrobial resistance and stewardship

- referring appropriately between services without raising expectations that antimicrobials will subsequently be prescribed.

1.1.18   Consider developing local networks across all care settings to communicate information and share learning on:

- antimicrobial prescribing

- antimicrobial resistance

- patient safety incidents.

1.1.19   Consider developing local systems and processes for peer review of prescribing. Encourage an open and transparent culture that allows health professionals to question antimicrobial prescribing practices of colleagues when these are not in line with local (where available) or national guidelines and no reason is documented.

1.1.20   Encourage senior health professionals to promote antimicrobial stewardship within their teams, recognising the influence that senior prescribers can have on prescribing practices of colleagues.

1.1.21   Raise awareness of current local guidelines on antimicrobial prescribing among all prescribers, providing updates if the guidelines change.

Laboratory testing

1.1.22   Ensure that laboratory testing and the order in which the susceptibility of organisms to antimicrobials is reported is in line with:

- national and local treatment guidelines

- the choice of antimicrobial in the local formulary

- the priorities of medicines management and antimicrobial stewardship teams.

Recommendations for prescribers and other health and social care practitioners

Antimicrobial guidelines

1.1.23   Health and social care practitioners should support the implementation of local antimicrobial guidelines and recognise their importance for antimicrobial stewardship.

Recommendations for prescribers

Antimicrobial prescribing

1.1.24   When prescribing antimicrobials, prescribers should follow local (where available) or national guidelines on:

- prescribing the shortest effective course

- the most appropriate dose

- route of administration.

1.1.25   When deciding whether or not to prescribe an antimicrobial, take into account the risk of antimicrobial resistance for individual patients and the population as a whole.

1.1.26   When prescribing any antimicrobial, undertake a clinical assessment and document the clinical diagnosis (including symptoms) in the patient's record and clinical management plan.

1.1.27   For patients in hospital who have suspected infections, take microbiological samples before prescribing an antimicrobial and review the prescription when the results are available.

1.1.28   For patients in primary care who have recurrent or persistent infections, consider taking microbiological samples when prescribing an antimicrobial and review the prescription when the results are available.

1.1.29   For patients who have non-severe infections, consider taking microbiological samples before making a decision about prescribing an antimicrobial, providing it is safe to withhold treatment until the results are available.

1.1.30   Consider point-of-care testing in primary care for patients with suspected lower respiratory tract infections as described in the NICE guideline on pneumonia in adults.

1.1.31   Prescribers should take time to discuss with the patient and/or their family members or carers (as appropriate):

- the likely nature of the condition

- why prescribing an antimicrobial may not be the best option

- alternative options to prescribing an antimicrobial

- their views on antimicrobials, taking into account their priorities or concerns for their current illness and whether they want or expect an antimicrobial

- the benefits and harms of immediate antimicrobial prescribing

- what they should do if their condition deteriorates (safety netting advice) or they have problems as a result of treatment

- whether they need any written information about their medicines and any possible outcomes.

1.1.32   When an antimicrobial is a treatment option, document in the patient's records (electronically wherever possible):

- the reason for prescribing, or not prescribing, an antimicrobial

- the plan of care as discussed with the patient, their family member or carer (as appropriate), including the planned duration of any treatment.

1.1.33   Do not issue an immediate prescription for an antimicrobial to a patient who is likely to have a self-limiting condition.

1.1.34   If immediate antimicrobial prescribing is not the most appropriate option, discuss with the patient and/or their family members or carers (as appropriate) other options such as:

- self-care with over-the-counter preparations

- back-up (delayed) prescribing

- other non-pharmacological interventions, for example, draining the site of infection.

1.1.35   When a decision to prescribe an antimicrobial has been made, take into account the benefits and harms for an individual patient associated with the particular antimicrobial, including:

- possible interactions with other medicines or any food and drink

- the patient's other illnesses, for example, the need for dose adjustment in a patient with renal impairment

- any drug allergies (see the NICE guideline on drug allergy; these should be documented in the patient's record)

- the risk of selection for organisms causing healthcare-associated infections, for example, *C. difficile*.

1.1.36   When prescribing is outside local (where available) or national guidelines, document in the patient's records the reasons for the decision.

1.1.37   Do not issue repeat prescriptions for antimicrobials unless needed for a particular clinical condition or indication. Avoid issuing repeat prescriptions for longer than 6 months without review and ensure adequate monitoring for individual patients to reduce adverse drug reactions and to check whether continuing an antimicrobial is really needed.

Prescribing intravenous antimicrobials

1.1.38   Use an intravenous antimicrobial from the agreed local formulary and in line with local (where available) or national guidelines for a patient who needs an empirical intravenous antimicrobial for a suspected infection but has no confirmed diagnosis.

1.1.39   Consider reviewing intravenous antimicrobial prescriptions at 48–72 hours in all health and care settings (including community and outpatient services). Include response to treatment and microbiological results in any review, to determine if the antimicrobial needs to be continued and, if so, whether it can be switched to an oral antimicrobial.

1.2   New antimicrobials

Recommendations for organisations (commissioners and providers)

1.2.1   Consider establishing processes for reviewing national horizon scanning to plan for the release of new antimicrobials.

1.2.2   Consider using an existing local decision-making group (for example, a drug and therapeutics committee, area prescribing committee or local formulary decision-making group) to consider the introduction of new antimicrobials

locally. The group should include representatives from different care settings and other local organisations to minimise the time to approval.

1.2.3   Consider using multiple approaches to support the introduction of a new antimicrobial, including:

- electronic alerts to notify prescribers about the antimicrobial

- prescribing guidance about when and where to use the antimicrobial in practice

- issuing new or updated formulary guidelines and antimicrobial prescribing guidelines

- peer advocacy and advice from other prescribers

- providing education or informal teaching on ward rounds

- shared risk management strategies for antimicrobials that are potentially useful but may be associated with patient safety incidents.

1.2.4   Once a new antimicrobial has been approved for local use, organisations should consider ongoing monitoring by:

- conducting an antimicrobial use review (reviewing whether prescribing is appropriate and in line with the diagnosis and local [where available] and national guidelines)

- costing the use of the new antimicrobial

- reviewing the use of non-formulary antimicrobial prescribing

- evaluating local prescribing and resistance patterns

- reviewing clinical outcomes such as response to treatment, treatment rates, emerging safety issues, tolerability and length of hospital stay.

Recommendations for local decision-making groups

1.2.5   Consider co-opting members with appropriate expertise in antimicrobial stewardship when considering whether to approve the introduction of a new antimicrobial locally; this may include those involved in the antimicrobial stewardship team (see also recommendation 1.1.8).

1.2.6   Ensure that local formularies, prescribing guidelines and care pathways are

updated when new antimicrobials are approved for use.

1.2.7   When evaluating a new antimicrobial for local use and for inclusion in the local
         formulary, take into account:

- the need for the new antimicrobial

- its clinical effectiveness

- the population in which it will be used

- the specific organisms or conditions for which it will be used

- dose, dose frequency, formulation and route of administration

- likely tolerability and adherence

- any drug interactions, contraindications or cautions

- local rates and trends of resistance

- whether use should be restricted and, if so, how use will be monitored

- any additional monitoring needed

- any urgent clinical need for the new antimicrobial

- any plans for introducing the new antimicrobial.

1.2.8   Local decision-making groups should assess the benefits and risks of restricting
         access to a new antimicrobial.

1.2.9   If access to a new antimicrobial is restricted:

- document the rationale for and the nature of the restriction, and ensure that this
  information is publicly available

- review the restriction regularly to determine that it is still appropriate.

1.2.10   Ensure that there is a plan for the timely introduction, adoption and diffusion of
         a new antimicrobial when this has been recommended for use.

1.2.11   Discuss with commissioners early in the approval process if funding concerns

for a new antimicrobial are likely to cause delay in its introduction, adoption and diffusion.

1.2.12 Indicate where prescribers can find accurate, evidence-based and up-to-date information about the new antimicrobial, such as the:

- British National Formulary (BNF)

- British National Formulary for Children (BNFC)

- electronic Medicines Compendium (eMC)

- European Medicines Agency (EMA)

- Medicines and Healthcare products Regulatory Agency (MHRA).

2   Implementation: getting started

This section highlights interventions for changing prescribing practice (education and feedback, and information systems to support data collection and feedback), as these could have a big impact on practice and be challenging to implement. We identified these with the help of healthcare practitioners including GPs and pharmacists, commissioners and Guideline Development Group (GDG) members.

2.1   The challenge: changing prescribing practice for antimicrobials

The benefits

Reducing the use of antimicrobials where they are not indicated will:

- slow down the emergence of antimicrobial resistance

- ensure that antimicrobials remain an effective treatment for infection

- improve clinical outcomes for the population as a whole

- conserve healthcare resources.

See the World Health Organization's factsheet on antimicrobial resistance.

2.1.1   Using education and feedback to change prescribing practice

See recommendations 1.1.3, 1.1.6, 1.1.9, 1.1.10, 1.1.17, 1.1.18, 1.1.19

Education and feedback have been recommended as a way of changing prescribers' attitudes and supporting antimicrobial stewardship. Potential barriers that may affect prescribers acting on messages about antimicrobial stewardship include:

- the possible risk of adverse outcomes from not treating

- not seeing the direct impact of their prescribing on antimicrobial resistance

- lack of critical evaluation, review and reflection on their own prescribing practice.

Managers and leads of services could support a change in prescribing practice by:

- allocating resources for education and feedback in their local area

- using governance processes such as audit so that prescribers follow antimicrobial guidelines

- creating an open and transparent culture so that prescribers can question prescribing when this doesn't follow antimicrobial guidelines

- providing regular updates across the service on individual prescribing, antimicrobial resistance and patient safety incidents

- including antimicrobial stewardship interventions in education programmes which are designed for the setting in which they are to be used

- encouraging prescribers to reflect on their personal practice

- including objectives for antimicrobial stewardship in prescribers' annual reviews

- signposting prescribers to relevant resources (see further resources for details of resources you may wish to include)

- using the NICE baseline assessment tool to evaluate current practice and plan changes.

Commissioners could support a change in prescribing practice by:

- using contracts to ensure that prescribers have the training and skills for antimicrobial stewardship

- using contracts to ensure that there are programmes for education and feedback on antimicrobial prescribing and resistance, which for secondary care could include the Antimicrobial stewardship: Start Smart - Then Focus toolkit, designed to provide an outline of evidence-based antimicrobial stewardship in the secondary care setting

- working with NHS England primary care commissioners to use the TARGET resource for commissioners

- ensuring that providers have data about rates and trends of antimicrobial prescribing (for example, from the NHS Business Service Authority)

- encouraging local learning networks, possibly across clinical areas or services, linking to NHS England where required (clinical commissioning groups could lead on this).

Those responsible for planning pre- and post-registration training for prescribers could support a change in prescribing practice by:

- including information about antimicrobial stewardship in training courses

- providing opportunities for prescribers to demonstrate via continuing professional development (CPD)/revalidation that they are following the principles of antimicrobial stewardship.

2.1.2   **Using information systems to change prescribing practice**

See recommendations 1.1.3, 1.1.6, 1.1.10, 1.1.11, 1.1.12

Information systems can help antimicrobial stewardship by capturing data to allow feedback on:

- rates and trends of antimicrobial prescribing

- rates and trends of antimicrobial resistance

- patient use of standard and back-up (delayed) prescriptions.

However the relevant data are not always captured or easily accessible.

Commissioners could support the use of information systems to change prescribing practice by:

- offering a central facility, which presents national and local data on antimicrobial prescribing and resistance in a format that is easy to use

- encouraging the introduction of electronic prescribing where systems are not in place (if a phased approach is needed, this could start with electronic prescribing for antimicrobials)

- learning from services such as orthopaedic wound clinics, which make significant contributions to local surveillance and antimicrobial stewardship

- commissioning the planning and designing of information systems to support antimicrobial stewardship by establishing working groups (to include IT specialists) across all services; this will need coordination and subgroup working to address differences between the various primary and secondary care services.

Commissioners and managers of services could support the use of information systems to change prescribing practice by:

- including the information standard 'Prescriber ID' (when available) as part of the set-up of the cost centre and registering of prescribers' codes

- circulating the data they receive about rates and trends of prescribing within their organisation

- using data on rates and trends of prescribing in programmes for educating prescribers about antimicrobial stewardship.

Further resources

- Antimicrobial prescribing and stewardship competencies (Public Health England, 2013).

- Antimicrobial resistance local indicators (Public Health England) provides national and local information on antimicrobial resistance, antibiotic prescribing, healthcare-associated infections, infection prevention and control, and antimicrobial stewardship.

- For primary care, the TARGET antibiotics toolkit designed to support CPD, audit, training and self-assessment for the whole primary care team within a GP practice or out-of-hours setting.

- Further resources are available from NICE to support implementation of this guideline.

- NICE produces indicators annually for use in the Quality and Outcomes Framework (QOF) for the UK. The process for this and the NICE menu are available.

- NICE uptake data about guideline recommendations and quality standard measures are available on the NICE website.

3 Research recommendations

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future. The Guideline Development Group's full set of research recommendations is detailed in the full guideline.

3.1 Reducing antimicrobial resistance

What interventions, systems and processes are effective and cost effective in reducing antimicrobial resistance without causing harm to patients?

Recommendation

One or more randomised controlled trials should be undertaken to determine whether short versus longer courses of antimicrobials, directly administered (or observed) therapy, continuous versus intermittent therapy and inhaled antimicrobials reduce the emergence of antimicrobial resistance and maintain patient outcomes compared with usual care in the UK setting.

3.2 Decision-making

What interventions, systems and processes are effective and cost effective in changing health and social care practitioners' decision-making and ensuring appropriate antimicrobial stewardship?

Recommendation

Randomised controlled trials should be undertaken to determine whether using point-of-care tests in decision-making is clinically and cost effective when prescribing antimicrobials in children, young people and adults presenting with respiratory tract infections.

Update information

Minor changes since publication

January 2018: Some links to other guidelines and external sources of information were updated.

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