NICE National Institute for Health and Care Excellence®

NICE guideline

Prophylaxis against infective endocarditis: antimicrobial prophylaxis against infective endocarditis in adults and children undergoing interventional procedures

Clinical guideline
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www.nice.org.uk/guidance/cg64

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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.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

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.

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Overview

This guideline covers preventing infective endocarditis (IE) in children, young people and adults. It focuses on people at increased risk of infective endocarditis undergoing dental, gastrointestinal tract, genitourinary and respiratory tract procedures.

Who is it for?

- Healthcare professionals
- Commissioners
- Children, young people and adults, and their families and carers

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Using this guideline

People have the right to be involved in discussions and make informed decisions about their care, as described in NICE's information about shared decision making.

Healthcare professionals should follow our general guidelines for people delivering care:

- Babies, children and young people's experience of healthcare
- Decision-making and mental capacity
- Medicines adherence
- Medicines optimisation
- Multimorbidity
- Patient experience in adult NHS services
- Shared decision making
- Transition from children's to adults' services

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

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Recommendations

Adults and children with structural cardiac defects at risk of developing infective endocarditis

1.1.1 Healthcare professionals should regard people with the following cardiac conditions as being at increased risk of developing infective endocarditis:

- acquired valvular heart disease with stenosis or regurgitation
- hypertrophic cardiomyopathy
- previous infective endocarditis
- structural congenital heart disease, including surgically corrected or palliated structural conditions, but excluding isolated atrial septal defect, fully repaired ventricular septal defect or fully repaired patent ductus arteriosus, and closure devices that are judged to be endothelialised
- valve replacement. **[2015]**

Patient advice

1.1.2 Healthcare professionals should offer people at increased risk of infective endocarditis clear and consistent information about prevention, including:

- the benefits and risks of antibiotic prophylaxis, and an explanation of why antibiotic prophylaxis is no longer routinely recommended
- the importance of maintaining good oral health
- symptoms that may indicate infective endocarditis and when to seek expert advice
- the risks of undergoing invasive procedures, including non-medical procedures such as body piercing or tattooing. **[2015]**

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Prophylaxis against infective endocarditis

1.1.3 Antibiotic prophylaxis against infective endocarditis is not recommended routinely:

- for people undergoing dental procedures
  - For advice on antibiotic prophylaxis for people at high risk of infective endocarditis undergoing dental procedures and for relevant patient information, see the Scottish Dental Clinical Effectiveness Programme's implementation advice on antibiotic prophylaxis against infective endocarditis (this programme is part of NHS Education for Scotland). It has been endorsed for use across the UK by the Chief Dental Officers of the UK.
- for people undergoing non-dental procedures at the following sites:
  - upper and lower gastrointestinal tract
  - genitourinary tract; this includes urological, gynaecological and obstetric procedures, and childbirth
  - upper and lower respiratory tract; this includes ear, nose and throat procedures and bronchoscopy. **[2015]**

    The evidence reviews for this guideline covered only procedures at the sites listed in this recommendation. Procedures at other sites are outside the scope of the guideline (see the scope for details).

1.1.4 Chlorhexidine mouthwash should not be offered as prophylaxis against infective endocarditis to people at risk of infective endocarditis undergoing dental procedures. **[2015]**

Infection

1.1.5 Any episodes of infection in people at risk of infective endocarditis should be investigated and treated promptly to reduce the risk of endocarditis developing. **[2015]**

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1.1.6 If a person at risk of infective endocarditis is receiving antimicrobial therapy because they are undergoing a gastrointestinal or genitourinary procedure at a site where there is a suspected infection, the person should receive an antibiotic that covers organisms that cause infective endocarditis. **[2015]**

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Context

Infective endocarditis is a rare condition with significant morbidity and mortality. It may arise after bacteraemia in a person with a predisposing cardiac lesion.

In the past, people at risk of infective endocarditis were given antibiotic prophylaxis before dental and certain non-dental interventional procedures. However, Gould et al. (2006) and Wilson et al. (2007) recommended changes in clinical practice that aimed to limit the use of antibiotic prophylaxis in people having these procedures.

In 2008 NICE published a guideline to give clear, evidence-based guidance on best clinical practice for prophylaxis against infective endocarditis in people having dental and certain non-dental interventional procedures. The guideline recommended that people at risk of infective endocarditis having interventional procedures (dental procedures, upper and lower respiratory tract procedures, upper and lower gastrointestinal tract procedures, genitourinary tract procedures) should not be offered antibiotic prophylaxis against infective endocarditis. It also recommended which patients with pre-existing cardiac lesions should be regarded as at risk. These recommendations marked a further change from accepted practice.

The incidence of infective endocarditis has been shown to be increasing over time. The reasons for this are not well understood. However, in 2014 the Lancet published a paper that reported an increase in cases of infective endocarditis from 2000 to 2013, which showed a higher rate of increase following the publication of the NICE guideline (Dayer et al. 2015). In light of this paper, NICE felt it was important to assess any new evidence published since the 2008 NICE guideline. This evidence has been taken into account in the 2015 update of this guideline.

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Recommendations for research

In 2008, the Guideline Committee made 3 recommendations for research.

As part of the 2015 update, the Standing Committee made an additional recommendation for research on antibiotic prophylaxis against infective endocarditis, found in the addendum.

1 National register of infective endocarditis

Infective endocarditis is a rare condition. The development of a national register of infective endocarditis in the UK to support research is recommended.

Why the committee made the recommendation for research

Such research would be facilitated by the availability of a national register that could offer data into the 'case' arm of proposed case control studies and should be an anonymised database that would not require patient consent and hence more straightforward case ascertainment. Although it is a rare condition, it is likely that across the country there are enough patients to generate evidence from well conducted national studies.

2 Cardiac conditions and infective endocarditis

What is the risk of developing infective endocarditis in people with acquired valvular disease and structural congenital heart disease?

Why the committee made the recommendation for research

Such research should use a population-based cohort study design to allow direct comparison between groups and allow estimation of both relative and absolute risk.

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3 Interventional procedures and infective endocarditis

What is the frequency and level of bacteraemia caused by non-oral daily activities (for example, urination or defaecation)?

Why the committee made the recommendation for research

Such research should quantitatively determine the frequency and level of bacteraemia.

4 Antibiotic prophylaxis against infective endocarditis

Does antibiotic prophylaxis in those at risk of developing infective endocarditis reduce the incidence of infective endocarditis when given before a defined interventional procedure?

Why the committee made the recommendation for research

There is limited evidence about the effectiveness of antibiotic prophylaxis in reducing the incidence of infective endocarditis in people at risk of developing infective endocarditis. The current evidence includes very limited data from observational studies with inconclusive findings. The study should be a randomised controlled trial with long term follow up comparing antibiotic prophylaxis with no antibiotic prophylaxis in adults and children with underlying structural cardiac defects undergoing interventional procedures. Outcomes should include the incidence infective endocarditis in those receiving prophylaxis compared to those not, and the incidence of adverse effects including anaphylaxis.

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Finding more information and committee details

To find NICE guidance on related topics, including guidance in development, see the NICE topic page on structural heart defects.

For full details of the evidence and the guideline committee's discussions, see the evidence reviews. You can also find information about how the guideline was developed, including details of the committee.

NICE has produced tools and resources to help you put this guideline into practice. For general help and advice on putting our guidelines into practice, see resources to help you put NICE guidance into practice.

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Update information

July 2016: Recommendations 1.1.1 and 1.1.2 have been amended to clarify they apply to people at increased risk.

'Routinely' has been added to recommendation 1.1.3 for consistency with recommendation 1.1.2. This addition emphasises NICE's standard advice on healthcare professionals' responsibilities. Doctors and dentists should offer the most appropriate treatment options, in consultation with the patient and/or their carer or guardian. In doing so, they should take account of the recommendations in this guideline and the values and preferences of patients, and apply their clinical judgement.

September 2015: This guideline is an update of NICE guideline CG64 (published March 2008). No new recommendations have been added. For recommendations marked as **[2015]** the evidence has been reviewed but no change has been made to the recommended action.

Minor changes since publication

December 2024: We clarified recommendation 1.1.3 for people undergoing dental procedures and the implementation advice provided by the Scottish Dental Clinical Effectiveness Programme.

October 2024: A link has been added to recommendation 1.1.3 to an implementation resource from the Scottish Dental Clinical Effectiveness Programme. For more information, see the surveillance report.

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