Prophylaxis against infective endocarditis

NICE guideline: short version

Draft for consultation, May 2015

If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the 2015 guideline addendum.

Contents

Introduction

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, the British Society for Antimicrobial Chemotherapy Guidelines for the prevention of endocarditis (2006) and the American Heart Association guideline Prevention of infective endocarditis (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 (Incidence of infective endocarditis in England, 2000-13 Dayer MJ et al). In light of this paper, NICE felt it was important to assess any new evidence published since the 2008 NICE guideline.

Recommendations about medicines

The guideline will assume that prescribers will use a medicine's summary of product characteristics to inform decisions made with individual patients.

Patient-centred care

This guideline offers best practice advice on antimicrobial prophylaxis against infective endocarditis before an interventional procedure for adults and children in primary dental care, primary medical care, secondary care and care in community settings.

Patients and healthcare 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 healthcare professionals. If the patient 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. Healthcare professionals should follow the Department of Health's advice on consent. If someone does not have capacity to make decisions, healthcare professionals 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 healthcare professionals should follow the recommendations in Patient experience in adult NHS services.

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 at risk of infective endocarditis. Management should be reviewed throughout the transition process, and there should be clarity about who is the lead clinician to ensure continuity of care.

Strength of recommendations

Some recommendations can be made with more certainty than others. The Guideline Committee makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the Guideline Committee is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

For all recommendations, NICE expects that there is discussion with the patient about the risks and benefits of the interventions, and their values and preferences. This discussion aims to help them to reach a fully informed decision (see also ‘Patient-centred care’).

Interventions that must (or must not) be used

We usually use ‘must’ or ‘must not’ only if there is a legal duty to apply the recommendation. Occasionally we use ‘must’ (or ‘must not’) if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions that should (or should not) be used – a ‘strong’ recommendation

Recommendations that an intervention should be used are made when we are confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. Similarly, we recommend that an intervention should not be used when we are confident that an intervention will not be of benefit for most patients.

Interventions that could be used

Recommendations that an intervention could be used are made when we are confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The

choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Update information

This guideline is an update of the NICE guideline on prophylaxis against infective endocarditis CG64 (published March 2008) and will replace it.

You are invited to comment on the recommendations in this guideline. These are marked as **[2015]** because the evidence has been reviewed but no change has been made to the recommended action.

The original NICE guideline and supporting documents are available here.

1 Recommendations

The following guidance is based on the best available evidence. The guideline addendum gives details of the methods and the evidence used.

1.1 List of all 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 risk of developing infective endocarditis:

- acquired valvular heart disease with stenosis or regurgitation
- valve replacement
- 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
- previous infective endocarditis
- hypertrophic cardiomyopathy. **[2015]**

Patient advice

1.1.2 Healthcare professionals should offer people at 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]**

Prophylaxis against infective endocarditis

1.1.3 Antibiotic prophylaxis against infective endocarditis is not recommended:

- for people undergoing dental procedures
- for people undergoing non-dental procedures at the following sites[1]:
  - 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]**

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]**

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]**

[1] 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).

2 Research recommendations

In 2008, the Guideline Development Group made two recommendations for research (2.1 and 2.2 below), based on its review of evidence, to improve NICE guidance and patient care in the future.

As part of the 2015 update, the Standing Committee made an additional research recommendation on antibiotic prophylaxis against infective endocarditis (2.3). Further details for this recommendation can be found in the addendum.

It is noted that infective endocarditis is a rare condition and that research in this area in the UK would be facilitated by the availability of a national register that could offer data into the 'case' arm of proposed case–control studies.

2.1 Cardiac conditions and infective endocarditis

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

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.

2.2 Interventional procedures and infective endocarditis

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

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

2.3 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 this is important

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.

3 Other information

3.1 Scope and how this guideline was developed

The scope for the 2008 guideline covers the original recommendations. These recommendations were not changed after reviewing new evidence on prophylaxis against infective endocarditis.

How this guideline was developed

The 2008 guideline was developed by the NICE Internal Clinical Guidelines Programme. The Internal Clinical Guidelines Programme worked with a Guideline Development Group, comprising healthcare professionals (including consultants, GPs and nurses), patients and carers, and technical staff, which reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

NICE's Clinical Guidelines Update Programme updated this guideline in 2015. This guideline was updated using a Standing Committee of healthcare professionals, methodologists and lay members from a range of disciplines and localities, as well as topic experts.

The methods and processes for developing NICE guidelines can be found here.

3.2 Related NICE guidance

See the cardiovascular conditions: general and other page on the NICE website for related NICE guidance.

4 Standing Committee and NICE staff

4.1 Standing Committee

Members of Standing Committee A and the topic experts for the 2015 update are listed on the NICE website.

For the composition of the previous Guideline Development Group, see the full guideline.

4.2 Clinical Guidelines Update Team

Philip Alderson
Clinical Adviser

Emma Banks
Co-ordinator

Paul Crosland
Health Economist

Nicole Elliott
Associate Director

Sarah Glover
Information Specialist

Cheryl Hookway
Technical Analyst

Rebecca Parsons
Project Manager

Charlotte Purves
Administrator

Nitara Prasannan
Technical Analyst

Toni Tan

Technical Adviser

4.3 NICE project team

Mark Baker

Clinical Adviser

Christine Carson

Guideline Lead

Louise Shires

Guideline Commissioning Manager

Joy Carvill

Guideline Coordinator

Jessica Fielding

Public Involvement Adviser

Beth Shaw

Technical Lead

Catharine Baden-Daintree

Editor

4.4 Declarations of interests

The following members of the Standing Committee made declarations of interest. All other members of the Committee stated that they had no interests to declare.

Committee member	Interest declared	Type of interest	Decision taken
Damien Longson	Family member employee of NICE.	Personal family non-specific	Declare and participate
Damien Longson	Director of Research & Innovation, Manchester Mental Health & Social Care NHS Trust.	Personal non-specific financial	Declare and participate
Catherine Briggs	Husband is a consultant anaesthetist at the University Hospital of South Manchester.	Personal family non-specific	Declare and participate
Catherine Briggs	Member of the Royal College of Surgeons, the Royal College of General Practitioners, the Faculty of Sexual and Reproductive Health and the BMA.	Personal non-specific financial	Declare and participate
John Cape	Trustee of the Anna Freud Centre, a child and family mental health charity which applies for and receives grants from the Department of Health and the National Institute for Health Research.	Personal non-specific non-financial	Declare and participate
John Cape	Member of British Psychological Society and British Association for Behavioural & Cognitive Psychotherapists who seek to influence policy towards psychology and psychological therapies.	Personal non-specific non-financial	Declare and participate
John Cape	Clinical Services Lead half-day a week to Big Health, a digital health company that has one commercial product; an online CBT self-help programme for insomnia with online support.	Personal non-specific financial	Declare and participate
Alun Davies	Research grant funding – commercial: Vascular Insights; Acergy Ltd; Firstkind; URGO laboratoire; Sapheon Inc (terminated 2013). All administered by Imperial College London as Sponsor and Professor Davies as CI.	Personal non-specific financial	Declare and participate
Alun Davies	Research grant funding – non-commercial: National Institute for Health Research, British Heart Foundation, Royal College of Surgeons, Circulation Foundation,	Personal non-specific financial	Declare and participate

	European Venous Forum.		
Alun Davies	Non-commercial: Attendance at numerous national and international meetings as an invited guest to lecture, where the organising groups receive funding from numerous sources including device and pharmaceutical manufacturers. Organising groups pay expenses and occasionally honoraria – the exact source of funding is often not known.	Personal non-specific financial	Declare and participate
Alison Eastwood	Member of an independent academic team at Centre for Review & Dissemination, University of York commissioned by NICE through NIHR to undertake technology assessment reviews.	Non-personal non-specific financial	Declare and participate
Sarah Fishburn	Organises workshops for physiotherapists treating pelvic girdle pain. Paid for this work.	Personal non-specific financial	Declare and participate
Sarah Fishburn	Receives payment and expenses from the Nursing and Midwifery Council as a lay panellist of the Fitness to Practise Investigating Committee.	Personal non-specific financial	Declare and participate
Sarah Fishburn	Lay reviewer with the Local Supervising Authority auditing supervision of midwives – receives payment and expenses for this work.	Personal non-specific financial	Declare and participate
Sarah Fishburn	Lay reviewer for the National Institute for Health Research; has reviewed a number of research proposals being considered for funding. Paid for carrying out these reviews.	Personal non-specific financial	Declare and participate
Sarah Fishburn	Chair of the Pelvic Partnership, a support group for women with pregnancy-related pelvic girdle pain. This is a voluntary position.	Personal non-specific financial	Declare and participate
Sarah Fishburn	Trained as a chartered physiotherapist and qualified in 1988 but have not been in clinical practice since 1997. Remains a non-practicing member of the Chartered Society of Physiotherapy.	Personal non-specific financial	Declare and participate
Sarah	Appointed by Mott MacDonald to carry out reviews as a lay reviewer	Personal non-	Declare and

Fishburn	on behalf to the Nursing and Midwifery Council of Local Supervising Authorities and Universities providing courses for nurses and midwives. This is paid work.	specific financial	participate
Jim Gray	Deputy Editor, Journal of Hospital Infection, funded by the Healthcare Infection Society (HIS pay the hospital for my time).	Personal financial non-specific	Declare and participate
Jim Gray	Co-investigator in 4 major trials (3 HTA-funded; 1 British Council funded). 2 trials are about antibiotic prophylaxis on obstetrics and gynaecology to prevent pelvic infections, 1 is comparing different suture materials and the 4th is a diagnostic test accuracy study for use in woman in labour.	Non-personal financial non-specific	Declare and participate
Jim Gray	Associate Editor, International Journal of Antimicrobial Agents.	Non-personal financial non-specific	Declare and participate
Jim Gray	Associate Editor Journal of Pediatric Infectious Diseases.	Non-personal financial non-specific	Declare and participate
Jim Gray	Expert Advisor, British National Formulary for Children.	Non-personal financial non-specific	Declare and participate
Jim Gray	My Department is in receipt of an Educational Grant from Pfizer Ltd to develop improved diagnosis of invasive fungal infections in immunocompromised children.	Non-personal financial non-specific	Declare and participate
Kath Nuttall	None		No action
Tilly Pillay	None		No action
Nick Screaton	Attended Thorax meeting – travel expenses paid.	Non-specific personal financial	Declare and participate
Nick Screaton	Clinical Commissioning Group stakeholder member.	Non-specific personal non-financial	Declare and participate
Nick Screaton	Senior Editor British Journal of	Non-	Declare and

	Radiology.	specific personal non-financial	participate
Nick Screaton	Advisory Editor Clinical Radiology.	Non-specific personal non-financial	Declare and participate
Nick Screaton	Chair East of England British Institute of Radiology.	Non-specific personal non-financial	Declare and participate
Nick Screaton	Director – Cambridge Clinical Imaging LTD.	Non-specific personal financial	Declare and participate
Nick Screaton	British Thoracic Society Bronchiectasis Guidelines Group.	Non-specific personal non-financial	Declare and participate
Nick Screaton	Specialised Imaging Clinical Commissioning Group stakeholder member.	Non-specific personal non-financial	Declare and participate
Lindsay Smith	None		Declare and participate
Philippa Williams	None		Declare and participate
Sophie Wilne	Recipient of NHS Innovation Challenge Award for clinical awareness campaign to reduce delays in diagnosis of brain tumours in children and young adults. Award will be used to develop the campaign.	Personal non-specific non-financial	Declare and participate
Sophie Wilne	Co-investigator for RFPB grant to undertake systematic reviews in childhood brain tumours.	Personal non-specific non-financial	Declare and participate
Sophie Wilne	Co-investigator for grant awards from charity to evaluate impact of brain tumour awareness campaign.	Personal non-specific non-financial	Declare and participate
Sophie Wilne	Funding for travel and accommodation from Novartis to	Personal non-	Declare and participate

	attend a conference on the management of tuberous sclerosis.	specific financial	
Topic expert	**Interest declared**	**Type of interest**	**Decision**
Richard Balmer	Co-author: Hollis A, Willcoxon F, Smith A, Balmer R. An investigation into dental anxiety amongst paediatric cardiology patients. International Journal of Paediatric Dentistry. Article first published online.	Specific personal non-financial	Declare and participate
Richard Balmer	Committee member (representing British Society of Paediatric Dentistry) on specialist advisory committee for paediatric dentistry.	Specific personal non-financial	Declare and participate
Mark Dayer (non-voting expert)	Fees and expenses paid as a member of an advisory board to RESMED (developers, manufacturers and distributors of medical equipment for sleep-disordered breathing and other respiratory disorders).	Non-specific personal financial	Declare and participate
Mark Dayer (non-voting expert)	Fees paid by Pfizer/Bristol-Myers Squibb, for presentations on the diagnosis and management of atrial fibrillation.	Non-specific personal financial	Declare and participate
Mark Dayer (non-voting expert)	Fees paid by Boehringer-Ingelheim, for presentations on the diagnosis and management of atrial fibrillation.	Non-specific personal financial	Declare and participate
Mark Dayer (non-voting expert)	Fee paid by Roche, for presentations on the diagnosis and management of heart failure.	Non-specific personal financial	Declare and participate
Mark Dayer (non-voting expert)	Expenses paid by Sorin for educational support to attend 'New Horizons in Heart Failure' conference in London.	Non-specific personal financial	Declare and participate
Mark Dayer (non-voting expert)	Commercial trial sponsored by Novartis (PARAGON: heart failure) undertaken by department.	Non-specific non-personal financial	Declare and participate
Mark Dayer (non-voting expert)	Commercial trial sponsored by Novartis (CANTOS: coronary artery disease) undertaken by	Non-specific non-	Declare and participate

	department.	personal financial	
Mark Dayer (non-voting expert)	Commercial trial sponsored by Boehringer-Ingelheim (GLORIA AF: atrial fibrillation) undertaken by department.	Non-specific non-personal financial	Declare and participate
Mark Dayer (non-voting expert)	Commercial trial sponsored by Bristol-Myers Squibb (AEGEAN: atrial fibrillation) undertaken by department.	Non-specific non-personal financial	Declare and participate
Mark Dayer (non-voting expert)	Commercial trial sponsored by Biotronik (MATRIX: device registry) undertaken by department.	Non-specific non-personal financial	Declare and participate
Mark Dayer (non-voting expert)	Commercial trial sponsored by AstraZeneca (TIGRIS: coronary artery disease) undertaken by department.	Non-specific non-personal financial	Declare and participate
Mark Dayer (non-voting expert)	Lead author of a publication in The Lancet that has in part led to the review of the PIE guideline.	Specific personal non-financial	Declare and leave prior to the recommendations being made (non-voting expert)
Suzannah Power	None		Declare and participate
Craig Ramsay (non-voting expert)	None		Declare and leave (non-voting expert)
Jon Sandoe	Registration for 24th European Congress of Clinical Microbiology and Infectious Diseases in Barcelona provided by Abbott.	Specific personal financial	Declare and participate
Jon Sandoe	Accommodation/travel/subsistence for 24th European Congress of Clinical Microbiology and Infectious Diseases in Barcelona funded by Eumedica.	Specific personal financial	Declare and participate
Jon Sandoe	Honoraria paid by Astellas to a Leeds Charitable Trust Account for lecturing on the 7-point summary and implementation of AMR (antimicrobial resistance) Strategy.	Non-specific non-personal financial	Declare and participate
Jon Sandoe	Advisor board: Cubicin (medication used to treat serious bacterial infections).	Specific personal Non-financial	Declare and participate

Jon Sandoe	Chairman of the British Society for Antimicrobial Chemotherapy endocarditis working party.	Non-specific personal non-financial	Declare and participate
Jon Sandoe	Member of a British Heart Valve Society valve disease working party.	Non-specific personal non-financial	Declare and participate
Richard Watkin	Expenses paid to attend Medtronic sponsored EURO PCR meeting (technological advances in complex cardiovascular interventions).	Non-specific personal financial	Declare and participate
Richard Watkin	Expenses paid to attend 2015 Medtronic sponsored BCIS advanced coronary intervention meeting.	Personal financial non-specific	Declare and participate
Valentina Gallo	None		Declare and participate
Alison Loescher	None		Declare and participate