

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

Centre for Clinical Practice

Review consultation document

Review of Clinical Guideline (CG64) - Prophylaxis against infective endocarditis

1. Background information

Guideline issue date: 2008

3 year review: 2011

National Collaborating Centre: Short Clinical Guidelines - Centre for Clinical Practice (NICE)

2. Consideration of the evidence

Literature search

From initial intelligence gathering and a high-level randomised control trial (RCT) search clinical areas were identified to inform the development of clinical questions for focused searches. Through this stage of the process eight studies were identified relevant to the guideline scope. The identified studies were related to the following clinical area within the guideline:

- Antibiotic prophylaxis to prevent infective endocarditis

Two clinical questions were developed based on the clinical area above, qualitative feedback from other NICE departments and the views expressed by the Guideline Development Group, for more focused literature searches. The results of the focused searches are summarised in the table below.

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Two additional studies were identified through the high-level RCT search related to clinical areas not included in the focused searches:

- One study compared saline rinse with povidone-iodine prior to scaling of gingivitis patients at risk of infective endocarditis.⁽¹⁾ The results indicated that rinsing with povidone-iodine reduced the incidence of bacteraemia.
- The second study assessed whether poor oral hygiene is a risk factor for infective endocarditis-related bacteraemia.⁽²⁾ The study concluded that improved oral hygiene may reduce the risk of developing infective endocarditis.

In summary, insufficient evidence was identified through the above studies to change the direction of current guideline recommendations.

All references identified through the initial intelligence gathering, high-level RCT search and the focused searches can be viewed in [Appendix 1](#).

Clinical area 1: Adults and children with structural cardiac defects at risk of developing infective endocarditis		
Clinical question and related recommendation(s)	Summary of evidence	Relevance to guideline recommendations
<p>Q: What is the risk of developing infective endocarditis in those with acquired valvular disease and structural congenital heart disease? (NICE research recommendation)</p> <p><u>Relevant section of the guideline:</u> Adults and children with</p>	<p>Two studies were identified through the focused search relating to this clinical question.</p> <p>The first study aimed to assess the risk of surgery in adults with congenital valve disease (CVD) compared with acquired valve disease (AVD). Fifty-two patients had undergone 75 prior operations and 14 required urgent surgery. The results demonstrated that three (0.8%) hospital deaths occurred due to endocarditis.⁽³⁾</p> <p>Secondly, a retrospective observational cohort study in paediatric and adult patients with congenital heart disease (CHD) was identified.⁽⁴⁾ The aim of this study was to report risk factors for in-hospital mortality during infective endocarditis in patients with CHD.</p>	<p>No conclusive new evidence was identified which would change the direction of current guideline recommendations.</p>

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<p>structural cardiac defects at risk of developing infective endocarditis.</p> <p><u>Recommendation:</u> 1.1.1.</p>	<p>In summary, there appears to be no convincing evidence that would warrant a change of the existing guideline recommendations.</p>	
<p>Clinical area 2: Antibiotic prophylaxis to prevent infective endocarditis</p>		
<p>Clinical question and related recommendation(s)</p>	<p>Summary of evidence</p>	<p>Relevance to guideline recommendations</p>
<p>Q: Does antibiotic prophylaxis in those at risk of developing infective endocarditis reduce the incidence of infective endocarditis when given before a</p>	<p>Through the focused search six studies relevant to the clinical question were identified.</p> <p>An RCT was identified which aimed to compare the incidence, duration, nature, and magnitude of endocarditis-related bacteremia from single-tooth extraction and toothbrushing and to determine the impact of amoxicillin prophylaxis on single-tooth extraction.⁽⁵⁾ Participants were</p>	<p>No conclusive new evidence was identified which would change the direction of current guideline recommendations.</p>

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<p>defined interventional procedure?</p> <p><u>Relevant section of the guideline:</u> Antibiotic prophylaxis to prevent infective endocarditis.</p> <p><u>Recommendations:</u> 1.1.3 and 1.1.4.</p>	<p>randomised to toothbrushing, single-tooth extraction with amoxicillin prophylaxis, or single-tooth extraction with identical placebo. Blood was taken for bacterial culturing at varying time points before, during and after the interventions. The results indicated that the cumulative incidence of endocarditis-related bacteria from all blood draws was 23%, 33%, and 60% for the toothbrushing, extraction-amoxicillin, and extraction-placebo groups, respectively. The study authors concluded that due to the frequency for oral hygiene, toothbrushing may be a greater threat for individuals at risk for infective endocarditis</p> <p>An update of a Cochrane systematic review that was used in the original guideline was identified.⁽⁶⁾ The aim of this review was to determine the effect of antibiotic prophylaxis versus no prophylaxis or placebo before invasive dental procedures on the incidence of bacterial endocarditis in people at increased risk. The review included one case-control study which indicated no significant effect of penicillin prophylaxis on the incidence of endocarditis. As such, the review concluded that it is unclear whether antibiotic prophylaxis is effective or ineffective against</p>	
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	<p>bacterial endocarditis in people at risk who are about to undergo an invasive dental procedure.</p> <p>One systematic review was identified which evaluated the use of preoperative antibiotic prophylaxis among children and adults undergoing dental extraction or implant placement.⁽⁷⁾ Included studies were methodologically poor however as sample sizes were small and studies lacked comparator groups.</p> <p>Another systematic review assessed the evidence for the use of antibiotic prophylaxis in oral healthcare.⁽⁸⁾ One case-control study meeting the inclusion criteria included patients with specific cardiac conditions. The review concluded that there is a lack of evidence to support the use of antibiotic prophylaxis in oral healthcare.</p> <p>One systematic review evaluated the evidence base for the efficacy of antibiotic prophylaxis in dental practice.⁽⁹⁾ The review has a particular focus on specific medical conditions including cardiac-native heart valve</p>	
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	<p>disease, prosthetic heart valves and pacemakers; hip, knee and shoulder prosthetic joints; renal dialysis shunts; cerebrospinal fluid shunts; vascular grafts; immunosuppression secondary to cancer and cancer chemotherapy; systemic lupus erythematosus; and insulin-dependent (type 1) diabetes mellitus. The review concluded that there is little or no evidence to support the use of antibiotic prophylaxis in people with the medical conditions that were the focus of the review.</p> <p>A before-and-after study was identified which aimed to quantify the change in prescribing of antibiotic prophylaxis before invasive dental procedures for patients at risk of infective endocarditis following the introduction of the NICE guideline.⁽¹⁰⁾ The results indicated that following introduction of the NICE guideline there has been a significant reduction in prescribing of antibiotic prophylaxis. In addition, a large increase in the incidence of cases of or deaths from infective endocarditis in the two years after the guideline was published was not observed.</p> <p>In summary, no conclusive new evidence was identified which would</p>	
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	change the direction of the current recommendation that antibiotic prophylaxis against infective endocarditis is not recommended for people undergoing dental procedures.	
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Guideline Development Group and National Collaborating Centre perspective

A questionnaire was distributed to GDG members and the National Collaborating Centre (NCC) to consult them on the need for an update of the guideline. Six responses were received with respondents highlighting that since publication of the guideline the European Society of Cardiology and the American Heart Association have published updated guidelines on prophylaxis against infective endocarditis. In addition, GDG members also highlighted that there is concern among cardiologists that not providing prophylaxis against infective endocarditis poses a risk to patients with valvular heart disease or a history of valve replacement. This feedback contributed towards the development of the clinical questions for the focused searches.

Ongoing research relevant to the guideline was highlighted by GDG members including:

- A controlled study of prophylaxis in valve patients (RCT of antibiotic prophylaxis versus no prophylaxis for patients with prosthetic heart valves)
- A study suggesting that there has been no increase in infective endocarditis in children and that dental treatment does not appear to be the cause when infective endocarditis does occur
- Potential pilot of a national endocarditis registry in the north of England

The majority of questionnaire respondents felt that there is insufficient variation in current practice supported by adequate evidence at this time to warrant an update of the current guideline.

Implementation and post publication feedback

In total 204 enquiries were received from post-publication feedback, most of which were routine. The main theme emerging from post-publication feedback

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was concern about the recommendations relating to antibiotic prophylaxis. This feedback contributed towards the development of the clinical questions described above.

An analysis by the NICE implementation team was undertaken as part of the review process. As such, qualitative input from the field team was identified which indicated that implementation of the guideline has been variable.

Relationship to other NICE guidance

The following NICE guidance is related to CG64:

Guidance	Review date
CG74: Prevention and treatment of surgical site infection, 2008.	Currently being considered for an update. Review decision date October 2011.
PA25: Prevention of cardiovascular disease at the population level, 2010.	Review date: TBC.
Related NICE guidance in progress	
Clinical guideline: Infection control, prevention of healthcare-associated infection in primary and community care (update of CG2).	Currently in progress. Expected publication date March 2012.

Anti-discrimination and equalities considerations

No evidence was identified to indicate that the guideline scope does not comply with anti-discrimination and equalities legislation. The original scope

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contains recommendations for adults and children with known underlying structural cardiac defects, including those who have previously had infective endocarditis and adults and children who have previously had infective endocarditis (irrespective of whether they have a known underlying cardiac defect).

Conclusion

Through the process no additional areas were identified which were not covered in the original guideline scope or would indicate a significant change in clinical practice. There are no factors described above which would invalidate or change the direction of current guideline recommendations. The Prophylaxis against infective endocarditis guideline should not be updated at this time.

3. Review recommendation

The guideline should not be updated at this time.

The guideline will be reviewed again according to current processes.

Centre for Clinical Practice
11 July 2011

Appendix 1

- (1) Cherry M, Daly CG, Mitchell D, Highfield J. Effect of rinsing with povidone-iodine on bacteraemia due to scaling: a randomized-controlled trial. *Journal of Clinical Periodontology* 2007 Feb;34(2):148-55.
- (2) Lockhart PB, Brennan MT, Thornhill M, Michalowicz BS, Noll J, Bahrani-Mougeot FK, et al. Poor oral hygiene as a risk factor for infective endocarditis-related bacteremia. *Journal of the American Dental Association* 2009 Oct;140(10):1238-44.
- (3) Luciani GB, Viscardi F, Pilati M, Barozzi L, Faggian G, Mazzucco A. Operative risk and outcome of surgery in adults with congenital valve disease. *ASAIO Journal* 2008 Sep;54(5):458-62.
- (4) Yoshinaga M, Niwa K, Niwa A, Ishiwada N, Takahashi H, Echigo S, et al. Risk factors for in-hospital mortality during infective endocarditis in patients with congenital heart disease. *American Journal of Cardiology* 2008 Jan 1;101(1):114-8.
- (5) Lockhart PB, Brennan MT, Sasser HC, Fox PC, Paster BJ, Bahrani-Mougeot FK. Bacteremia associated with toothbrushing and dental extraction. *Circulation* 2008 Jun 17;117(24):3118-25.
- (6) Oliver R, Roberts GJ, Hooper L, Worthington HV. Antibiotics for the prophylaxis of bacterial endocarditis in dentistry. *Cochrane Database of Systematic Reviews* 2008;(4).

- (7) Schwartz AB, Larson EL. Antibiotic prophylaxis and postoperative complications after tooth extraction and implant placement: A review of the literature. *Journal of Dentistry* 2007;35(12):881-8.
- (8) Martin MV. Summary of: Antibiotic prophylaxis in oral healthcare - the agreement between Swedish recommendations and evidence. *British Dental Journal* 2010 Feb 13;208(3):114-5.
- (9) Lockhart PB, Loven B, Brennan MT, Fox PC. The evidence base for the efficacy of antibiotic prophylaxis in dental practice. *Journal of the American Dental Association* 2007;138(4):458-74.
- (10) Thornhill MH, Dayer MJ, Forde JM, Corey GR, Chu VH, Couper DJ, et al. Impact of the NICE guideline recommending cessation of antibiotic prophylaxis for prevention of infective endocarditis: before and after study. *BMJ* 2011;342:d2392.