Antibiotic Prophylaxis for
Infective Endocarditis

Version 1.0

Date approved: September 2018
Approved by: The Board
Review due: August 2019

Policy will be updated as required in response to a change in national policy or evidence-based guideline.
Clinical Guidelines on Antibiotic Prophylaxis For Infective Endocarditis

This document has been adapted from guidance produced by the Scottish Dental Clinical Excellence Programme (SDCEP) which is available at:


Background

Infective endocarditis (IE) is a potentially life-threatening infection of the inner lining of the heart (endocardium), and often involves the heart valves. The incidence of IE is low (less than 1 case per 10,000 individuals per year in the general population): Invasive surgical procedures including those in the dental office may result in a transient bacteraemia which may lead to IE. Although a history of dental treatment in the preceding 3-12 months may be found in only 2-5% cases of IE, it is important to assess the need for antibiotic prophylaxis in patients at risk of developing IE as the condition is associated with significant mortality (approximately 30%) and high morbidity (approximately 50%).

Previously, sporadic high-grade bacteraemias caused by invasive dental procedures were thought to be the main risk factor for IE of oral origin, with consequent widespread use of antibiotic prophylaxis. However, it is now believed that cumulative, low grade bacteraemias, triggered by normal daily activities such as tooth brushing, flossing and chewing, are of greater significance, emphasising the importance of maintaining good oral hygiene. Additionally, the evidence-base for the efficacy of antibiotic prophylaxis in preventing IE is weak and views on the risk-benefit analysis have shifted in recent years, with moves to reduce the utilisation of antibiotic prophylaxis. Therefore, the use of antibiotics should be considered carefully due to their side effects; development of antibiotic resistance; and cost.
The National Institute for Health and Care Excellence (NICE) has produced guidance on the Prophylaxis Against Infective Endocarditis (CG64) which states that “Antibiotic prophylaxis against infective endocarditis is not recommended routinely for people undergoing dental procedures”. However, for a very small number of patients, it may be prudent to consider antibiotic prophylaxis (non-routine management), in consultation with the patient and their cardiologist or cardiac surgeon. The SDcep guidance offers advice on how to implement the CG64.

Please familiarise yourself with this document including the following appendices:

- Appendix 1: Management of Patients at Increased Risk of Infective Endocarditis Flowchart.
- Appendix 2: Points to Cover During Antibiotic Prophylaxis Discussion With Patient
- Appendix 3: Template Letter for Liaising With Cardiology and Cardiac Surgical Teams.
- Appendix 4: Patient Leaflet – Dental Advice for People at Increased Risk Of Infective Endocarditis
- Appendix 5: Classification of Invasive and Non-invasive Dental Procedures.
- Appendix 6: Regimes for Antibiotic Prophylaxis Against Infective Endocarditis
Who is at Risk of Developing Infective Endocarditis?

NICE recommends that 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.

In addition, the following sub-groups of patients are at a higher risk of developing IE and require **special considerations**:

- patients with any prosthetic valve, including a transcatheter valve, or those in whom any prosthetic material was used for cardiac valve repair;
- patients with a previous episode of infective endocarditis;
- patients with congenital heart disease (CHD):
  - any type of cyanotic CHD;
  - any type of CHD repaired with a prosthetic material, whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if residual shunt or valvular regurgitation remains

**Note:** Patients with other cardiac conditions or cardiac procedures such as a stent or a pacemaker, are not considered to be at an increased risk of IE and antibiotic prophylaxis is not required in such patients.
Who Requires Antibiotic Prophylaxis for Infective Endocarditis?

Each patient needs to be assessed individually to determine their risk of developing IE. Patients may be categorised into those requiring either routine management or non-routine management (Appendix 1)

Routine Management

• Routine management without antibiotic prophylaxis may be offered to vast majority of patients at increased risk of developing IE. However, the patient and/or their carer or guardian must be made aware of their risk of IE and provided advice about prevention (Appendix 2), including:
  o the potential benefits and risks of antibiotic prophylaxis, and an explanation of why antibiotic prophylaxis is not routinely recommended;
  o the importance of maintaining good oral health;
  o symptoms that may indicate infective endocarditis and when to seek expert advice;
  o the risks of undergoing invasive procedures, including non-medical procedures such as body piercing or tattooing.

• Record that this discussion has taken place in the patient’s clinical notes.

• If, following this discussion, the patient requests antibiotic prophylaxis, consider seeking advice from their cardiology consultant, cardiac surgeon or local cardiology centre (Appendix 3).

Non-Routine Management

Patients who need special considerations should be considered for non-routine management in consultation with their cardiac specialist. Initial assessment should be carried out when they register with the dental practice, or when they are first diagnosed with a cardiac condition from the special consideration sub-group, to ensure that the relevant information is available should they require invasive dental treatment or have a dental emergency. Re-assessment of the decision on antibiotic prophylaxis will only be required if there is a change in the patient’s medical history.
If the cardiac specialist advises that antibiotic prophylaxis is not required, follow the advice for routine management.

Where antibiotic prophylaxis is being considered, ensure that the patient and/or their carer or guardian is aware of the risks and potential benefits to allow them to make an informed decision about whether prophylaxis is right for them.

- Provide advice about prevention, including:
  - 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.

Record that this discussion has taken place in the patient’s clinical notes.

- Ensure that any episodes of dental infection in this group of patients are investigated and treated promptly to reduce the risk of endocarditis developing.

**Antibiotic Prophylaxis Regimens**

Where antibiotic prophylaxis is offered for planned invasive procedures:

- Provide the patient with a prescription for antibiotic prophylaxis at the appointment prior to the planned procedure.
- Where a patient’s cardiology consultant, cardiac surgeon or local cardiology centre suggests an alternative prophylaxis regimen, it is acceptable to follow their advice but ensure that the reasons for this are recorded in the patient’s clinical notes.
- Include a note on the prescription that the antibiotic is being prescribed for prophylaxis.
- For patients who require sequential invasive treatments over a short time period, the same antibiotic can be prescribed for the purposes of prophylaxis for each treatment episode.

*Please refer to Appendix 6 for antibiotic regimes for prophylaxis against IE.*
Appendix 1:
Management of Patients at Increased Risk of Infective Endocarditis Flowchart.

Management of Patients at Increased Risk of Infective Endocarditis

Does the patient have a cardiac condition from the special consideration* sub-group?

Yes or don’t know

- Offer advice on prevention as outlined for Routine Management.
- Contact the patient’s cardiology consultant, cardiac surgeon or local cardiology centre to determine if prophylaxis should be considered for invasive procedures.

No

Does the cardiologist advise that prophylaxis should be considered for invasive procedures?

Yes

- Discuss the potential benefits and risks of prophylaxis for invasive dental procedures with the patient to allow them to make an informed decision about whether prophylaxis is right for them.

No

Does the patient want prophylaxis to be prescribed for invasive procedures?

Yes

Non-Routine Management

- If you do not hold a stock of prophylactic antibiotics in your practice, provide the patient with a prescription for antibiotic prophylaxis at the appointment prior to planned invasive procedure(s).
- Advise the patient to bring the antibiotic with them to the dental practice on the day of the procedure(s). Alternatively, the patient may choose to take the antibiotic at home.
- Give advice on possible adverse events such as hypersensitivity, anaphylaxis and antibiotic-related colitis.

No

Routine Management

- Ensure that the patient and/or their carer or guardian are aware of their risk of IE and provide advice about prevention, including:
  - the potential 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.

*These are:
- patients with any prosthetic valve, including a transcatheter valve, or those in whom any prosthetic material was used for cardiac valve repair;
- patients with a previous episode of infective endocarditis;
- patients with congenital heart disease (CHD):
  - any type of cyanotic CHD;
  - any type of CHD repaired with a prosthetic material, whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if residual shunt or valvular regurgitation remains.

Ensure that any episodes of dental infection in people at increased risk of infective endocarditis are investigated and treated promptly to reduce the risk of endocarditis developing.

*If an increased risk patient who is not in the special consideration sub-group expresses a desire for antibiotic prophylaxis, consider contacting the patient’s cardiology consultant, cardiac surgeon or local cardiology centre for advice.

For further details of these recommendations and advice on following them, refer to the full Implementation Advice, available at www.sdcep.org.uk.
Appendix 2: Points to Cover During Antibiotic Prophylaxis Discussion With Patient

Points to cover during antibiotic prophylaxis discussion with patient

**It is important that patients are not discouraged from undergoing dental treatment.**

- Advise the patient that due to their heart condition/previous episode of infective endocarditis, there is a very small risk of developing infective endocarditis following an invasive dental procedure but ensure that they understand that the risk is very low.
  - Explain that infective endocarditis is an infection of the lining of the heart, often involving the heart valves, caused mainly by bacteria which enter the blood from outside the body.
  - Emphasise that infective endocarditis is a very rare but serious condition. The risk of infective endocarditis in the general population is less than 1 case per 10,000 people per year. However, their cardiac condition puts them at increased risk of developing infective endocarditis.

The figure below may help you to explain risk to patients.

<table>
<thead>
<tr>
<th>Risk Frequency</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 10</td>
<td>Someone in your family</td>
</tr>
<tr>
<td>1 in 100</td>
<td>Someone in a street</td>
</tr>
<tr>
<td>1 in 1000</td>
<td>Someone in a village</td>
</tr>
<tr>
<td>1 in 10,000</td>
<td>Someone in a small town</td>
</tr>
<tr>
<td>1 in 100,000</td>
<td>Someone in a large town</td>
</tr>
</tbody>
</table>

(Adapted from Risk Language and Dialects, Calman and Royston, BMJ 1997; 315:939)

- Explain that having an invasive dental procedure, such as an extraction, may increase the chances of bacteria entering the bloodstream.

- Explain that everyday activities, such as toothbrushing, flossing and chewing can also cause transient bacteraemias and stress the importance of good oral hygiene, which can reduce the risk from oral bacteria.

- Give advice on prevention of infective endocarditis to all increased risk patients including:
  - the potential benefits and risks of antibiotic prophylaxis, and an explanation of why antibiotic prophylaxis is no longer routinely recommended;
    - Explain that dental procedures are no longer thought to be the main cause of infective endocarditis.
    - Explain that it is unclear whether antibiotic prophylaxis prevents infective endocarditis and therefore it may occur whether or not prophylaxis is given.
    - Explain that antibiotics can cause side effects, such as nausea, diarrhoea and allergic reactions and, in rare cases, anaphylaxis and antibiotic-related colitis. It may also be helpful to discuss the issues surrounding antibiotic resistance.
  - the importance of maintaining good oral health;
    - Explain the importance of maintaining good oral health to prevent infective endocarditis.
    - Highlight the importance of regular dental check-ups to ensure that any dental disease is treated before invasive dental surgery is required.
Appendix 2: Points to Cover During Antibiotic Prophylaxis Discussion With Patient (Continued)

Points to cover during antibiotic prophylaxis discussion with patient

- Emphasise that excellent oral hygiene is the best way to prevent oral diseases that could require invasive dental treatment and will also reduce the chance of oral bacteria getting into the blood stream.
- Advise the patient to reduce the frequency of sugary snacks and drinks to prevent tooth decay.
- the risks of undergoing invasive procedures, including non-medical procedures such as body piercing or tattooing.

For all patients at increased risk of infective endocarditis, advise them to contact their GMP as soon as possible if they notice any of the following symptoms, particularly if they occur together as a flu-like illness:

- A high temperature (fever) of 38°C or above
- Sweats or chills, especially at night
- Breathlessness, especially during physical activity
- Weight loss
- Tiredness (fatigue)
- Muscle, joint or back pain (unrelated to recent physical activity)

- Emphasise that these symptoms are more likely to be caused by a less serious type of infection but should be investigated.
- Ensure that the patient knows to tell any medical professional they seek advice from about any recent invasive dental treatment they may have had.

Record all discussions with the patient in their clinical notes.

For patients who are considering antibiotic prophylaxis as part of non-routine management, discuss the potential benefits and risks of antibiotic prophylaxis to allow them to make an informed decision.

- Ensure patients are aware of the potential for hypersensitivity, anaphylaxis or antibiotic-associated colitis.
- Ensure that the patient is aware that the antibiotic prophylaxis should be taken in the dental practice one hour prior to the planned procedure and that they will be required to stay in the practice in the intervening period.
- Alternatively, the patient may choose to take the antibiotic at home. Consider suggesting they contact the practice prior to taking the antibiotic to confirm that the procedure will be going ahead.
- Ensure that patients prescribed an antibiotic are aware that they should seek urgent medical attention if they develop colitis (diarrhoea, which may be severe).
Appendix 3: Template Letter for Liaising With Cardiology and Cardiac Surgical Teams.

Dear _____________________

Re: _____________________________                       D.O.B.:_______________________

Address:_________________________________________________________________

__________________________________________ ______________________________

Email:___________________________________________________________________

I understand the above individual is under your care. I have referred to both NICE Clinical Guideline 64 and the SDCEP implementation advice on *Prophylaxis Against Infective Endocarditis* and I am writing to enquire whether, due to their heart condition, it is your opinion that this patient requires antibiotic prophylaxis against infective endocarditis before undergoing invasive dental procedures.

I would be very grateful if you could reply to the address above and provide details of the patient’s heart condition, any related medications and whether, in your opinion, antibiotic prophylaxis is appropriate if the patient is undergoing an invasive dental procedure such as an extraction.

I have discussed the matter with [Enter Patient/parent/carer name] and she/he is happy that I discuss this important issue with you.

Yours sincerely,

Dental Practitioner
Appendix 4: Patient Leaflet – Dental Advice for People at Increased Risk Of Infective Endocarditis.

Dental advice for people at increased risk of infective endocarditis

What is infective endocarditis?
Infective endocarditis is an infection of the lining of the heart that often involves the heart valves. It is a very rare but serious condition.

Why am I at risk of infective endocarditis?
Infective endocarditis can affect anyone but people who have specific heart problems are at increased risk. These include:
- some diseases that affect the heart valves;
- having a replacement heart valve;
- a condition called hypertrophic cardiomyopathy;
- a history of infective endocarditis;
- some types of heart problem present from birth (congenital heart disease), even if you have had an operation to correct the problem.

Why might this affect my dental treatment?
Dental procedures which cause bleeding, such as having a tooth extracted, may increase the chances of bacteria entering your bloodstream. However, everyday activities such as brushing your teeth or chewing food can have the same effect over time.
The risk of infective endocarditis developing from either of these routes is very low. However, as it is such a serious condition, your dentist may consider whether any additional precautions are needed for your dental treatment.

Can I reduce my risk of infective endocarditis?
You can reduce your risk by:

- **Looking after your oral health**
  - Clean your teeth regularly and carefully using fluoride toothpaste.
  - Have regular dental check-ups.
  - Cut down on sugary snacks and drinks.
  - Do not smoke. For help and advice on quitting go to www.canstopsmoking.com.
  - Cut down the amount of alcohol you drink.

- **Taking care of your skin**
  - Regularly wash your skin with soap and water and wash any cuts or grazes carefully to prevent them becoming infected.
  - Avoid non-medical procedures that involve piercing the skin, including body piercing or tattooing.
Appendix 4: Patient Leaflet – Dental Advice for People at Increased Risk Of Infective Endocarditis (Continued).

Dental advice for people at increased risk of infective endocarditis

Should I be offered antibiotics when I have dental treatment?

The National Institute for Health and Care Excellence (NICE) recommends that people should not usually be given antibiotics before dental procedures. This is because:

- dental procedures are no longer thought to be the main cause of infective endocarditis;
- we are uncertain whether antibiotic prophylaxis prevents infective endocarditis;
- taking an antibiotic carries its own risks, such as an allergic reaction or diarrhoea;
- antibiotic resistance is increasing due to antibiotics being used unnecessarily.

What will my dentist do?

Your dentist will talk with you about the potential benefits and risks of antibiotics and explain why antibiotics are not usually recommended to prevent infective endocarditis.

Most people at increased risk of infective endocarditis will not need antibiotics when they have dental treatment. However, a small number may need to be further assessed.

If this applies to you, your dentist will contact other healthcare professionals involved in your care to decide whether you should be offered antibiotics. You will then have the opportunity to discuss whether this is right for you.

Symptoms of infective endocarditis

You should contact your GP as soon as possible if you notice any of the following symptoms, particularly if they occur together as a flu-like illness:

- A high temperature (fever) of 38°C or above
- Sweats or chills, especially at night
- Breathlessness, especially during physical activity
- Weight loss
- Tiredness (fatigue)
- Muscle, joint or back pain (unrelated to recent physical activity)

These symptoms are more likely to be caused by a less serious type of infection. However, your doctor will want to investigate. Make sure that you tell them about any recent dental treatment you have had.

Sources of advice and support

National Institute for Health and Care Excellence, www.nice.org.uk
Oral Health Foundation, 01788 539780, www.dentalhealth.org
British Heart Foundation, 0300 330 3311, www.bhf.org.uk
Children’s Heart Federation, 0808 808 5000, www.chfed.org.uk

This leaflet has been developed by the Scottish Dental Clinical Effectiveness Programme (SDCEP), part of NHS Education for Scotland. This and other patient information is available on the SDCEP website (www.sdcep.org.uk).
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### Appendix 5: Classification of Invasive and Non-invasive Dental Procedures

<table>
<thead>
<tr>
<th>Invasive dental procedures</th>
<th>Non-invasive dental procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Placement of matrix bands</td>
<td>• Infiltration or block local anaesthetic injections in non-infected soft tissues</td>
</tr>
<tr>
<td>• Placement of sub-gingival rubber dam clamps</td>
<td>• BPE screening</td>
</tr>
<tr>
<td>• Sub-gingival restorations including fixed prosthodontics</td>
<td>• Supra-gingival scale and polish</td>
</tr>
<tr>
<td>• Endodontic treatment before apical stop has been established</td>
<td>• Supra-gingival restorations</td>
</tr>
<tr>
<td>• Preformed metal crowns (PMC/SSCs)</td>
<td>• Supra-gingival orthodontic bands and separators</td>
</tr>
<tr>
<td>• Full periodontal examinations (including pocket charting in diseased tissues)</td>
<td>• Removal of sutures</td>
</tr>
<tr>
<td>• Root surface instrumentation/sub-gingival scaling</td>
<td>• Radiographs</td>
</tr>
<tr>
<td>• Incision and drainage of abscess</td>
<td>• Placement or adjustment of orthodontic or removable prosthodontic appliances</td>
</tr>
<tr>
<td>• Dental extractions</td>
<td></td>
</tr>
<tr>
<td>• Surgery involving elevation of a muco-periosteal flap or muco-gingival area</td>
<td></td>
</tr>
<tr>
<td>• Placement of dental implants including temporary anchorage devices, mini-implants</td>
<td></td>
</tr>
<tr>
<td>• Uncovering implant sub-structures</td>
<td></td>
</tr>
</tbody>
</table>

N.B. In addition, antibiotic prophylaxis is not recommended following exfoliation of primary teeth or trauma to the lips or oral mucosa.
Appendix 6: Regimes for Antibiotic Prophylaxis Against Infective Endocarditis

If antibiotic prophylaxis is required, an appropriate oral regimen is:

<table>
<thead>
<tr>
<th>Amoxicillin, 3 g Oral Powder Sachet*</th>
<th>Dose for children:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give: 3 g (1 sachet) 60 minutes before procedure (3 g prophylactic dose)</td>
<td>Amoxicillin Oral Suspension*, 250 mg/5 ml or 3 g Oral Powder Sachet*</td>
</tr>
<tr>
<td></td>
<td>6 months – 17 years: 50 mg/kg; maximum dose 3 g (prophylactic dose)</td>
</tr>
</tbody>
</table>

NB: Amoxicillin, like other penicillins, can result in hypersensitivity reactions, including rashes and anaphylaxis, and can cause antibiotic-associated colitis, which may be fatal. Do not give amoxicillin to patients with a history of anaphylaxis, urticaria or rash immediately after penicillin administration as these individuals are at risk of immediate hypersensitivity. Amoxicillin potentially alters the anticoagulant effect of warfarin and therefore the INR of a patient taking warfarin should be monitored.

Refer to Appendix 1 of the BNF and BNFC for details of drug interactions.

*Sugar-free preparation is available.

In patients who are allergic to penicillin, an appropriate oral regimen is:

<table>
<thead>
<tr>
<th>Clindamycin Capsules, 300 mg</th>
<th>Dose for children*:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give: 600 mg (2 capsules) 60 minutes before procedure (600 mg prophylactic dose)</td>
<td>6 months – 17 years: 20 mg/kg; maximum dose 600 mg (prophylactic dose)</td>
</tr>
</tbody>
</table>

NB: Advise patient that capsules should be swallowed with a glass of water. Do not prescribe clindamycin to patients with diarrhoeal states. Be aware that clindamycin can cause the side-effect of antibiotic-associated colitis, which may be fatal.

Refer to Appendix 1 of the BNF and BNFC for details of drug interactions.

*As clindamycin is not available as an oral suspension, it may not be possible to give the appropriate dose for some child weight ranges. Azithromycin oral suspension is a suitable alternative in this situation.
In patients who are allergic to penicillin and unable to swallow capsules, an appropriate oral regimen is:

<table>
<thead>
<tr>
<th><strong>Azithromycin Oral Suspension</strong></th>
<th><strong>Dose for children:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>200 mg/5 ml</strong></td>
<td>Azithromycin Oral Suspension 200 mg/5 ml</td>
</tr>
<tr>
<td>Give: 500 mg (12.5 ml) 60 minutes before procedure</td>
<td>6 months – 11 years: 12 mg/kg; maximum dose 500 mg</td>
</tr>
<tr>
<td>(500 mg prophylactic dose)</td>
<td>12-17 years: 500 mg (prophylactic dose)</td>
</tr>
</tbody>
</table>

NB: Azithromycin can cause abdominal discomfort, diarrhoea, nausea and vomiting in some patients.

Refer to Appendix 1 of the BNF and BNFC for details of drug interactions.