

## Bacterial Endocarditis Treatment

### Background

**Always consult a Microbiologist if endocarditis is suspected.**

- **Endocarditis is a life-threatening infection of the heart valves, associated with either congenital or disease-induced anomalies of native or prosthetic valves.**
- **Alpha-haemolytic streptococci are the most common causes of native valve endocarditis.**
  - ***S. aureus* more likely if the disease is rapidly progressive with high fever.**
- ***S. aureus* and *S. epidermidis* are common on prosthetic valves.**
- **Three separate sets of blood cultures should be taken before starting treatment.**

### Introduction and Purpose

Antimicrobial Guidelines are intended to provide clinicians guidance on the management (both treatment and prevention) of common infections. This guideline forms part of a series of antimicrobial guidelines.

The clinical guidelines provide evidence based and best practice on the management of patients with infective episodes. They include empirical antimicrobial therapy including dose, route and duration of therapy and where necessary microbiological investigations

### Objectives

- To improve the quality of antimicrobial prescribing and reduce inappropriate prescribing.
- To maximise the clinical effectiveness of antimicrobial agents used.
- To reduce drug related toxicity and development of antimicrobial resistance.
- To ensure cost effective use of antimicrobial agents.

### Scope

This guideline applies to all healthcare professionals involved in the prescription, administration and monitoring of antimicrobial agents.

## Development and consultation

The clinical guidelines have been produced by the lead clinician and lead pharmacist for each division in conjunction with microbiology. Who was the lead clinician?

## Empirical Treatment

<b>Native valve</b>	<u>Benzympenicillin</u> 1.2g IV 4 hourly <b>plus</b> <u>Gentamicin</u> 1mg/kg (max 80mg) IV 8 hourly
<b>Known IV drug abusers</b>	<u>Flucloxacillin</u> 2g IV 4 - 6 hourly <b>plus</b> <u>Gentamicin</u> 1mg/kg (max 80mg) IV 8 hourly
<b>Penicillin allergy</b> <b>OR</b> <b>If patient has prosthetic valve</b>	<u>Teicoplanin</u> 400mg IV 12 hourly for 3 doses, then 400mg IV daily <b>plus</b> <u>Gentamicin</u> 1mg/kg (max 80mg) IV 8 hourly

At any stage, treatment may have to be modified according to detailed antibiotic sensitivity tests, adverse reactions, allergy or failing to respond. Treatment failure as defined by continuing fever, malaise, and abnormal inflammatory markers will more often than not relate to the need for urgent and life saving surgery rather than a further futile attempt to gain disease control by a change of antibiotic therapy. Endocarditis (whether or not well) may require cardiac surgery. not considered controlled by antibiotics) may also lead to significant cardiac failure which of itself mandates urgent cardiac surgery.

### Gentamicin assays (see Gentamicin dosing guidelines)

It is essential to assay serum gentamicin levels several times a week to maintain adequate trough levels and avoid potentially toxic concentrations.

Gentamicin serum concentrations: Pre (trough) = <1mg/L

Post (peak) = 3 – 5mg/L

## Treatment of Bacterial Species Isolated

<b><i>Streptococcus endocarditis</i> – penicillin sensitive (MIC &lt; 1 mg/L)</b>	<u>Benzylpenicillin</u> 1.2g IV 4 hourly <b>plus</b> <u>Gentamicin</u> 1mg/kg IV 12 hourly for maximum of 2 weeks. If patient responds well after two weeks, it is possible to change to an oral regimen for another 2 to 4 weeks. Discuss with Microbiology.
<b><i>Enterococcal endocarditis</i>*</b>	<u>Benzylpenicillin</u> 2.4g IV 4 hourly or <u>Amoxicillin</u> 2g IV 4 hourly for 4 weeks <b>plus</b> <u>Gentamicin</u> 1mg/kg IV 8 hourly for the first 2 weeks
<b><i>S. aureus endocarditis</i></b>	<u>Flucloxacillin</u> 2g IV 4 – 6 hourly for 4 to 6 weeks <b>plus</b> <u>Gentamicin</u> 1mg/kg IV 8 hourly for the first 5 –14 days. Sodium fusidate can be substituted for gentamicin if patient improving. Discuss with Microbiology.
<b>Coagulase negative staphylococcus endocarditis</b>	<u>Teicoplanin</u> 400mg (6 mg/kg) IV 12 hourly for 3 doses then 400mg daily for 6 weeks <b>plus</b> <u>Gentamicin</u> 1mg/kg IV 8 hourly for first 2 weeks
<b>If no organism isolated</b>	<u>Benzylpenicillin</u> 1.2g IV 6 hourly or <u>Teicoplanin</u> 400mg (6 mg/kg) IV 12 hourly for 3 doses then 400mg daily for 6 weeks <b>plus</b> <u>Gentamicin</u> 1mg/kg IV 8 hourly for first 2 weeks
<b>Penicillin allergy</b>	For all of the above groups, replace penicillin with <u>Teicoplanin</u> 400mg IV 12 hourly for 3 doses, then 400mg IV daily

\* Some strains of *Enterococcus* can be very antibiotic resistant. These require close collaboration with microbiology for successful treatment. Teicoplanin plasma levels can be measured if renal function is poor, if the patient is a drug abuser or if there is failure of response. Assay will confirm therapeutic concentrations are present but are not required for avoidance of toxicity. Contact Microbiology if levels are contemplated. Alternative therapies may be needed in the case of glycopeptides-tolerant strains of *S aureus*. Any case of endocarditis with unusual, or unusually antibiotic-resistant organisms, *must* be discussed with Microbiology.

## References

1. Guidelines for the antibiotic treatment of endocarditis in adults: report of the Working Party of the British Society for Antimicrobial Chemotherapy. T. S. J. Elliott, J. Foweraker, F. K. Gould, J. D. Perry, and J. A. T. Sandoe. Journal of Antimicrobial Chemotherapy. 2004 Dec;54(6):971-81.