

Action 1:

Obtain cultures before starting therapy

Important: If a severe or life threatening infection is suspected, take blood cultures promptly where possible, then commence antibiotic therapy immediately without waiting for the results of microbiology tests.

It is important that specimens for microbiological testing are obtained before commencing antibiotic therapy wherever possible. A specific microbiological diagnosis enables effective targeting of antibiotic therapy against demonstrated pathogens and optimisation of antibiotic dosage and duration.

Blood cultures are the most important specimen to collect for patients with sepsis and should be collected urgently. Cultures from other sites, such as wound, sputum, urine and cerebrospinal fluid (CSF), are most useful if taken prior to starting antibiotics, but collections should not delay empiricⁱ antibiotic therapy.

Bacterial culture and antibiotic susceptibility results are usually available 24 to 48 hours after specimen collection and timely review of these results can often guide early decision to de-escalateⁱⁱ therapy, change treatment, or cease antibiotics altogether.¹⁻⁴

Seek expert advice. Discussing management with medical microbiology services or clinical microbiology specialists from your testing laboratory can help to facilitate effective use of microbiological testing, interpretation of test results and ensure appropriateness of antibiotic choice.

When obtaining specimens for blood culture, the following points are important to avoid contamination:¹

- Use aseptic technique during collection. Perform appropriate skin preparation using an alcohol based antiseptic, and avoid re-touching skin site prior to venipuncture.
- Avoid collecting blood cultures via indwelling central or peripheral lines where possible. Use of indwelling lines reduces the specificity of a positive result. It also places lines at risk of contamination and subsequent line-related infection.

ⁱ Empiric antibiotic therapy is antibiotic therapy that is commenced before the causative organism has been identified, for example before culture and antibiotic susceptibility results are available.

ⁱⁱ De-escalation refers to converting to targeted therapy once the pathogen and susceptibilities are known

Key points:

- If severe or life threatening infection is suspected, take blood cultures promptly where possible, then commence antibiotic therapy immediately without waiting for results of microbiology tests
- Use bacterial culture and antibiotic susceptibility results as soon as they are available to target antibiotic therapy
- When obtaining cultures, follow correct procedures to avoid contamination

- Collect at least two blood culture sets (four bottles) in an adult from two separate venipuncture sites - this helps to achieve acceptable sensitivity and enables confirmation of infection due to organisms that may potentially contaminate blood cultures. The two sets can be taken sequentially without delay.

Useful resources

Sepsis management

Sepsis is a medical emergency. The accepted principles of treatment include prompt administration of antibiotics (target to administer within one hour of suspecting sepsis).¹ Refer to *Therapeutic Guidelines: Antibiotic*⁵ or local endorsed sepsis management guidelines for advice regarding immediate antibiotic choice.

The NSW Clinical Excellence Commission “Sepsis Kills” program aims to reduce preventable harm to patients through improved recognition and management of severe infection and sepsis in emergency departments and inpatient wards throughout NSW. Further information about this program is available at:

<http://www.cec.health.nsw.gov.au/programs/sepsis>.⁶

The Australian Sepsis Network aims to reduce the Australian burden of disease (death and disability) due to sepsis. The website includes a range of resources for health professionals, including links to tools and resources to help support appropriate management. Access the webpage at <http://www.australiansepsisnetwork.net.au>.⁷

The Antimicrobial Stewardship (AMS) Clinical Care Standard.

The Antimicrobial Stewardship (AMS) Clinical Care Standard aims to ensure that a patient with a bacterial infection receives optimal treatment with antibiotics. It provides advice to clinicians, consumers and health services on key components of care related to antibiotic therapy. The AMS Clinical Care Standard is due for publication late 2014. For more information, visit www.safetyandquality.gov.au/ccs

References and further reading

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2. Drew R, White R, MacDougall C, Hermesen E, Owens R, Jr, Society of Infectious Diseases Pharmacists. Insights from the Society of Infectious Diseases Pharmacists on antimicrobial stewardship guidelines from the Infectious Diseases Society of America and the Society of Epidemiology of America. *Pharmacotherapy* 2009; 29(5):593-607.
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4. MacDougall C, Polk R. Antimicrobial stewardship programs in health care systems. *Clinical Microbiology reviews* 2005;18:638-656.
5. Antibiotic Expert Group. *Therapeutic Guidelines: Antibiotic*. Version 14. Melbourne: Therapeutic Guidelines Ltd; 2010. Note: The next edition of Therapeutic Guidelines: Antibiotic (version 15) will be published in November 2014.
6. Sepsis Kills. Clinical Excellence Commission (CEC) web site.(Accessed at <http://www.cec.health.nsw.gov.au/programs/sepsis>).
7. The Australian Sepsis Network. (Accessed 12 September 2014 at <http://www.australiansepsisnetwork.net.au/healthcare-providers/treatment-sepsis>).

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This document is intended for use by health professionals. It has been created from information contained in *Antimicrobial Stewardship in Australian Hospitals 2011* and reviewed by clinical experts. Reasonable care has been taken to ensure this information is accurate at the date of creation. This fact sheet is intended to be used in its original version and can be downloaded from the Australian Commission on Safety and Quality in Health Care web page www.safetyandquality.gov.au.

“No action today, no cure tomorrow” is adopted from the WHO World Health Day 2011