Appendix 10  Obstetrics and Gynaecology Surgery
Appendix 11  Ophthalmology
Appendix 12  Orthopaedic Surgery (Joint Replacement)
Appendix 13  Orthopaedic Surgery (Not Joint Replacement)
Appendix 14  Plastic and Reconstructive Surgery
Appendix 15  Thoracic Surgery
Appendix 16  Urology
Appendix 17  Vascular Surgery

8. Document Ownership & History
1. Guideline Statement

Surgical antimicrobial prophylaxis has become an accepted part of surgical practice to prevent infections at the surgical site and optimise postoperative recovery. This Surgical Antimicrobial Prophylaxis Guideline has been developed by SAAGAR to assist clinicians with recommendations on appropriate antimicrobial dosage and administration, risks and contraindications, and postoperative care for a range of surgical procedures.

The recommendations within this guideline are based on those published in the Australian Therapeutic Guidelines, and are intended to allow for some variations for South Australian patient demographics and resistance patterns.

2. Roles and Responsibility

The Surgical Antimicrobial Prophylaxis Clinical Guideline applies to surgery performed in all South Australian public hospitals.

2.1. Local Health Network (LHN) Chief Executive Officers will:
> ensure clinicians have access to this guideline in electronic format
> ensure adequate resources and training are available for the implementation of this guideline throughout the LHN
> maintain an effective mechanism for review of implementation of this guideline within the LHN
> ensure the LHN meets standards for accreditation in relation to surgical antimicrobial prophylaxis.

2.2. LHN AMS Committees are responsible for:
> providing governance over the use of prophylactic antimicrobial agents in surgery
> providing leadership for addressing requirements of the LHN relating to meeting the surgical prophylaxis national standards for accreditation
> working collaboratively with departments of surgery, anesthesiology, or other relevant hospital committees regarding development and implementation of surgical guidelines
> coordinating actions in response to results of audits of antimicrobial use in surgical prophylaxis
> providing leadership for the training of clinical staff throughout the LHN in relation to AMS.

2.3. Prescribers (including contracted staff) are responsible for:
> safe and appropriate prescribing according to the general principles of antimicrobial surgical prophylaxis
> ensuring antimicrobials are ordered so that they are administered within appropriate time frames as specified in individual surgical prophylaxis guidelines
> prescribing according to the appropriate surgical prophylaxis guideline (see appendices) or using the latest version of Therapeutic Guidelines: Antibiotic as part of their practice (1)
> where prescribing is not compliant with guidelines, documenting the reason on the medication chart or case notes
provision of information to patients and their carers regarding their antimicrobial therapy prior to surgery.

2.4. **Pharmacists (including contracted staff) are responsible for:**
- timely and accountable supply of antimicrobials used in surgical prophylaxis in accordance with systems introduced by the LHN AMS Program, including mechanisms to control access to restricted antimicrobials where restrictions exist
- safe, appropriate and timely advice to prescribers and nurses with regard to the selection, dose, route, duration and monitoring of antimicrobials used in surgical prophylaxis
- where it is within their scope of practice, participation in providing evidence of monitoring antimicrobial use in relation to surgical prophylaxis through auditing processes
- provision of information to patients and their carers regarding their antimicrobial therapy prior to surgery.

2.5. **Nurses are responsible for:**
- being aware of the existence of surgical prophylaxis guidelines for a range of surgical specialties, and able to assist prescribers to access electronic guidelines
- where it is within their scope of practice, ensuring safe and timely administration of prescribed antimicrobials used in surgical prophylaxis
- where it is within their scope of practice, participation in providing evidence of monitoring antimicrobial use in relation to surgical prophylaxis through auditing processes
- assisting patients and carers to obtain information and understanding of their antimicrobial therapy.

3. **Policy Requirements**

3.1. **Background**
Prevention of surgical site infection accounts for between one-third and one-half of all antimicrobial use in Australian hospitals. AURA 2016: First Australian report on antimicrobial use and resistance in human health found that surgical prophylaxis was the most common reason for antimicrobial use in hospitals in 2014 (2). Of this use, 40% was deemed inappropriate due to long duration, incorrect dose, or frequency (3). This guideline aims to standardise the prescribing of surgical antimicrobial prophylaxis across the state.

3.2. **Recommendations**
Antimicrobial prophylaxis should be considered where there is a clear indication, a risk of postoperative infection, or if postoperative infection will have serious consequences.

The recommended antimicrobial prophylaxis regimens for specific surgical procedures, along with alternatives for patients with a high risk of penicillin/cephalosporin allergy, are available in appendices 1 to 17.

3.2.1. **Practice Points**
Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, malnutrition, diabetes, infection at another site, available pathology or malignancy).

Pre-existing infections at surgical site (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

For patients with cardiac conditions that increase their risk of endocarditis following surgery, refer to [Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis](#) for further information.
3.2.2. Drug administration

- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15-30 minutes). Administration after skin incision or > 60 minutes before incision reduces effectiveness.
- IV infusion – should be commenced 30-60 minutes prior to skin incision (e.g. metronidazole). See below for vancomycin administration.

3.2.3. MRSA risk

Defined as history of MRSA colonisation or infection, OR inpatient of high risk hospital or unit (where MRSA is endemic) for more than the last 5 days; add vancomycin (see vancomycin administration below).

3.2.4. Vancomycin administration

Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: infusion can be completed after skin incision.

3.2.5. Clindamycin administration

Give clindamycin 600mg (child: 15mg/kg up to 600mg) by IV infusion over at least 20 minutes just before procedure. Repeat 4 hourly intra-operatively for prolonged procedures.

3.2.6. Gentamicin administration

Dosing should be based on ideal body weight, provided ideal body weight is less than actual body weight. (See Aminoglycosides: Recommendations for use, dosing and monitoring clinical guideline)

3.2.7. Repeat doses

A single pre-operative dose is sufficient for most procedures; however, repeat intra-operative doses are advisable:

- for prolonged surgery (> 4 hours from the time of the first pre-operative dose) when a short-acting agent is used (e.g. cefazolin); or
- if major blood loss occurs, following fluid resuscitation.

3.2.8. Obese patients

Consider increased dose of cefazolin if patient is obese (>120kg). Consult ID for advice.

4. Implementation and Monitoring

Where they exist, LHN AMS committees coordinate actions in response to results of audits of antimicrobial use in surgical prophylaxis. The results of annual audits or KPI assessments should be reported to LHN Chief Executive Officers and LHN Safety and Quality committees, together with a plan for continuous (PDSA) improvement.
5. National Safety and Quality Health Service Standards

The following National Safety and Quality Health Service Standard (NSQHSS) standards apply:

**Standard 3 – Preventing & Controlling Healthcare Associated Infections**

> Criterion 3.14 – Developing, implementing and regularly reviewing the effectiveness of the antimicrobial stewardship system.

**Standard 4 – Medication Safety**

> Criterion 4.1 – Developing and implementing governance arrangements and organisational policies, procedures and/or protocols for medication safety, which are consistent with national and jurisdictional legislative requirements, policies and guidelines.

6. Definitions

In the context of this document:

> **KPI** Key Performance Indicators
> **IBW** Ideal Body Weight
> **ID** Infectious Disease Physician
> **IV** Intravenous
> **MRSA** Methicillin-resistant *Staphylococcus aureus*
> **PDSA** Plan-Do-Study-Act
> **PO** Per oral
> **SAAGAR** South Australian expert Advisory Group on Antimicrobial Resistance (SAAGAR)
> **SSI** Surgical site infection
7. Associated Directives / Guidelines & Resources

7.1. SA Policies and guidelines
   Antimicrobial Stewardship Policy Directive
   Antimicrobial Prescribing Clinical Guideline
   Peripartum Prophylactic Antibiotics Clinical Guideline

7.2. References

7.3. Appendices
   Appendix 1 Breast procedures / Endocrine procedures / Abdominal procedures (including Splenectomy) / Herniorrhaphy / Insertion of infusaport / Clean excision procedures
   Appendix 2 Cardiac Surgery
   Appendix 3 CVIU / Cardiology Procedures
   Appendix 4 Prevention of Endocarditis
   Appendix 5 Endoscopic Gastrointestinal Surgery
   Appendix 6 Gastrointestinal Surgery
   Appendix 7 Head and Neck Surgery Prophylaxis
   Appendix 8 Maxillofacial Surgery
   Appendix 9 Neurosurgery Prophylaxis
   Appendix 10 Obstetrics and Gynaecology Surgery
   Appendix 11 Ophthalmology
   Appendix 12 Orthopaedic Surgery (Joint Replacement)
   Appendix 13 Orthopaedic Surgery (Not Joint Replacement)
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   Appendix 16 Urology
   Appendix 17 Vascular Surgery
8. Document Ownership & History

**Document developed by:** South Australian expert Advisory Group on Antimicrobial Resistance (SAAGAR)

**File / Objective No.:** 2011-10137 | eA988353

**Next review due:** 2/11/2022

**Policy history:**
- Is this a new policy (V1)? **N**
- Does this guideline amend or update an existing policy? **Y**
  - If so, which version? Version 1.1
- Does this guideline replace another policy with a different title? **N**
  - If so, which guideline (title)?

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<thead>
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<th>Version</th>
<th>Who approved New/Revised Version</th>
<th>Reason for Change</th>
</tr>
</thead>
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<td>2/11/2017</td>
<td>V2</td>
<td>Safety &amp; Quality Strategic Governance Committee</td>
<td>Formally reviewed in line with 1-5 year scheduled timeline for review.</td>
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<td>12/08/14</td>
<td>V1.1</td>
<td>Safety &amp; Quality Strategic Governance Committee</td>
<td>Minor amendments to reflect current practice.</td>
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<tr>
<td>12/02/13</td>
<td>V1</td>
<td>Safety &amp; Quality Strategic Governance Committee</td>
<td>Original approved version.</td>
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</tbody>
</table>
Pre-Operative Considerations

Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, malnutrition, diabetes, infection at another site, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

*For patients with cardiac conditions refer to Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis for further information.

Practice Points

Drug administration
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 30 minutes). Administration after skin incision or > 60 minutes before incision reduces effectiveness
- IV infusion – should be commenced 30-60 minutes prior to skin incision for metronidazole. See below for vancomycin administration.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last 5 days)
- Add vancomycin to cefazolin

Vancomycin administration
- Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: infusion can be completed after skin incision.

Repeat doses
A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
- for delayed or prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. amoxicillin, cefazolin), OR
- if major blood loss occurs, following fluid resuscitation.

Obese patients
- Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td></td>
<td>High risk of MRSA infection: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td></td>
</tr>
<tr>
<td>Uncomplicated clean procedures (wound revision, excision scar tissue, local excision, lumpectomy)</td>
<td>Prophylaxis NOT recommended</td>
<td></td>
</tr>
<tr>
<td>Endocrine</td>
<td>Thyroidectomy (or similar)</td>
<td>Prophylaxis NOT recommended</td>
</tr>
<tr>
<td>Abdominal</td>
<td>Procedures involving viscera (e.g. appendicectomy, division of adhesions, resection)</td>
<td>metronidazole 500mg IV infusion (child: 12.5mg/kg), PLUS cefazolin 2g IV (child: 30mg/kg up to 2g) OR gentamicin 2mg/kg IV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High risk of MRSA infection: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td>Procedures not involving viscera (e.g. abdominoplasty)</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td></td>
<td>High risk of MRSA infection: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td></td>
</tr>
<tr>
<td>Splenectomy</td>
<td>(Vaccination and post-splenectomy antibiotic prophylaxis required in all cases)</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
</tr>
<tr>
<td></td>
<td>High risk of MRSA infection: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td></td>
</tr>
</tbody>
</table>

SA Health Clinical Guideline for Vaccination and Antimicrobial Prophylaxis for Adult Asplenic (Splenectomy) and Hyposplenic Patients available here.
## Recommended Prophylaxis

<table>
<thead>
<tr>
<th><strong>Recommended Prophylaxis</strong></th>
<th><em>High risk penicillin/cephalosporin allergy</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Herniorrhaphy</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
</tr>
<tr>
<td>&gt; with mesh insert</td>
<td>High risk of MRSA infection: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td>&gt; without mesh insert</td>
<td>Prophylaxis NOT recommended</td>
</tr>
<tr>
<td>Other</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
</tr>
<tr>
<td>Insertion of infusaport/other devices</td>
<td>High risk of MRSA infection: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td>Clean excision procedures</td>
<td>Prophylaxis NOT recommended</td>
</tr>
</tbody>
</table>

## Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains. If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.

## Definitions / Acronyms

- **DRESS**: Drug rash with eosinophilia and systemic symptoms
- **ID**: Infectious Diseases
- **IV**: Intravenous
- **MRSA**: Methicillin-resistant *Staphylococcus aureus*
- **SJS / TEN**: Stevens-Johnson syndrome / Toxic epidermal necrolysis

* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

## References


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*Endorsed by South Australian expert Advisory Group on Antibiotic Resistance (SAAGAR) March 2012, Last reviewed and amended August 2017*

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**Pre-Operative Considerations**

Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

Local epidemiology - modify prophylaxis if there is a high local incidence of specific infections.

**Practice Points**

**Drug administration**

- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.
- IV infusion – should be commenced 30-60 minutes prior to incision (e.g. gentamicin). See below for vancomycin administration.

**MRSA risk** (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)

- Add vancomycin to cefazolin (see vancomycin administration below).

**Vancomycin administration**

- Give vancomycin 1g (1.5g for patients > 80kg actual body weight) started 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes).

**Gentamicin administration**

Dosing should be based on ideal body weight, provided ideal body weight is less than actual body weight.

**Repeat doses**

A single pre-operative dose is sufficient for most procedures however repeat intra-operative doses (2g cefazolin) are advisable:

- for delayed or prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin); OR
- if major blood loss occurs requiring fluid resuscitation.

**Obese patients**

- Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

**Recommended Prophylaxis**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cefazolin 2g IV before skin incision</th>
<th>Vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS gentamicin 5mg/kg IV (based on ideal body weight) THEN (post-operative)</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary Artery Bypass Surgery (CABG)</td>
<td>THEN (post-operative) cefazolin 2g IV 8-hourly for a further 2 doses</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS gentamicin 5mg/kg IV (based on ideal body weight) THEN (post-operative) vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) 12 hours after first dose</td>
<td>Cefazolin 2g IV before skin incision THEN (post-operative) cefazolin 2g IV 8-hourly for a further 2 doses</td>
</tr>
<tr>
<td>Routine Cardiac Valve Surgery</td>
<td>PLUS vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) THEN (post-operative) cefazolin 2g IV 8-hourly for a further 2 doses</td>
<td>PLUS vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS gentamicin 5mg/kg IV (based on ideal body weight) THEN (post-operative) vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) 12 hours after first dose</td>
<td>Cefazolin 2g IV before skin incision PLUS vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS gentamicin 5mg/kg IV (based on ideal body weight) THEN (post-operative) vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) 12 hours after first dose</td>
</tr>
</tbody>
</table>
Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk Cardiac Valve Surgery</strong>&lt;br&gt;Trans-catheter Aortic Valve Implantation (TAVI)</td>
<td><strong>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</strong>&lt;br&gt;PLUS &lt;br&gt;<strong>gentamicin 5mg/kg IV (based on ideal body weight)</strong>&lt;br&gt;THEN (post-operative) &lt;br&gt;<strong>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</strong> &lt;br&gt;12 hours after first dose</td>
</tr>
<tr>
<td>cefazolin 2g IV before skin incision</td>
<td><strong>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</strong> &lt;br&gt;PLUS &lt;br&gt;<strong>gentamicin 5mg/kg IV (based on ideal body weight)</strong>&lt;br&gt;THEN (post-operative) &lt;br&gt;<strong>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</strong> &lt;br&gt;12 hours after first dose</td>
</tr>
<tr>
<td>PLUS depending on local epidemiology consider additional</td>
<td></td>
</tr>
<tr>
<td>MRSA Methicillin-resistant Staphylococcus aureus</td>
<td></td>
</tr>
<tr>
<td><strong>Definitions / Acronyms</strong>&lt;br&gt;CABG Coronary Artery Bypass Graft&lt;br&gt;DRESS Drug rash with eosinophilia and systemic symptoms&lt;br&gt;ID Infectious Diseases&lt;br&gt;IV Intravenous&lt;br&gt;MRSA Methicillin-resistant Staphylococcus aureus&lt;br&gt;SJS / TEN Stevens-Johnson syndrome / Toxic epidermal necrolysis&lt;br&gt;TAVI Trans-catheter Aortic Valve Implantation&lt;br&gt;* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (e.g. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)</td>
<td></td>
</tr>
</tbody>
</table>
Pre-Operative Considerations

Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

Practice Points

Drug administration
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.
- IV infusion – should be commenced 30-120 minutes prior to incision (e.g. vancomycin). See vancomycin administration below.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of high risk hospital or unit (where MRSA is endemic) for more than the last 5 days)
- Add vancomycin to cefazolin (see vancomycin administration below)

Vancomycin administration
- Give vancomycin 1g (1.5g for patients > 80kg actual body weight) starting the infusion 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes)

Gentamicin administration
Dosing should be based on ideal body weight, provided ideal body weight is less than actual body weight.

Repeat doses
A single pre-operative dose is sufficient for most procedures; however, repeat intra-operative doses (2 g cefazolin) are advisable:
- for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
- if major blood loss occurs, following fluid resuscitation

Obese patients
Consider higher doses of cefazolin (3g) if patient morbidly obese (>120kg). Consult ID for advice.

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent pacemaker/defibrillator insertion</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g) PLUS In patients with high MRSA risk, repeat procedures, poor skin integrity, anticipated difficult procedure, or recent (within last 3 months) antibiotic treatment: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS gentamicin 2mg/kg IV</td>
</tr>
<tr>
<td>Routine angioplasty, stent insertion</td>
<td>Prophylaxis NOT recommended</td>
<td></td>
</tr>
<tr>
<td>Valvuloplasty, septal occlusion for high risk patients only (e.g. femoral catheter &gt; 6hrs, prosthetic valves, past history of endocarditis, atrial septal defect closure device insertion)</td>
<td>cefazolin 2g IV, then 8 hourly for up to 2 further doses PLUS vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS gentamicin 5mg/kg IV</td>
</tr>
</tbody>
</table>

Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.
Definitions / Acronyms

CVIU  Cardiovascular investigational unit
DRESS  Drug rash with eosinophilia and systemic symptoms
ID  Infectious Diseases
IV  Intravenous
MRSA  Methicillin-resistant Staphylococcus aureus
SJS / TEN  Stevens-Johnson syndrome / Toxic epidermal necrolysis

* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

References


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**Pre-Operative Considerations**

Antibiotic prophylaxis to prevent endocarditis is ONLY recommended for patients with cardiac conditions associated with the HIGHEST RISK of adverse outcomes from endocarditis (See Box 1) and only for certain conditions (See Box 2).

<table>
<thead>
<tr>
<th>Box 1: Cardiac conditions for which antibiotic prophylaxis to prevent endocarditis is recommended.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Prosthetic cardiac valve or prosthetic material used for cardiac valve repair</td>
</tr>
<tr>
<td>&gt; Previous infective endocarditis</td>
</tr>
<tr>
<td>&gt; Cardiac transplantation with the subsequent development of cardiac valvulopathy</td>
</tr>
<tr>
<td>&gt; Rheumatic heart disease in Indigenous Australians and individuals at significant socioeconomic disadvantage</td>
</tr>
<tr>
<td>&gt; Congenital heart disease, only if it involves:</td>
</tr>
<tr>
<td>i) unrepaired cyanotic defects, including palliative shunts and conduits;</td>
</tr>
<tr>
<td>ii) completely repaired defects with prosthetic material or devices, whether placed by surgery or catheter intervention, during the first six months after the procedure (after which the prosthetic material is likely to have endothelialised);</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>iii) repaired defects with residual defects at, or adjacent to the site of a prosthetic patch or device (which inhibit endothelialisation).</td>
</tr>
</tbody>
</table>

**Antibiotic prophylaxis for endocarditis MAY be required.**  
See Box 2.

**Box 2: Procedures where antibiotic prophylaxis for endocarditis may or may not be required**

<table>
<thead>
<tr>
<th>Prophylaxis ALWAYS REQUIRED</th>
<th>CONSIDER prophylaxis</th>
<th>Prophylaxis IS NOT REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DENTAL PROCEDURES:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; extractions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; periodontal procedures including surgery, subgingival scaling and root planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; replanting avulsed teeth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; other surgical procedures (e.g. implant placement, apicectomy).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RESPIRATORY PROCEDURES:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any invasive procedure involving incision or biopsy of respiratory mucosa, for example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; tonsillectomy/ adenoidectomy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; surgery involving bronchial, sinus, nasal or middle ear mucosa, including tympanostomy tube insertion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GENITOURINARY AND GASTROINTESTINAL PROCEDURES:</strong> Any procedure where antibiotic prophylaxis is indicated for surgical reasons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; lithotripsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; any genitourinary procedure in the presence of a genitourinary infection unless already treating enterococci (for elective cystoscopy or urinary tract manipulations, obtain a urine culture and treat any bacteruria beforehand)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; any gastrointestinal procedure in the presence of an intra-abdominal infection unless already treating enterococci</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; sclerotherapy for oesophageal varices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OTHER PROCEDURES:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Incision and drainage of local abscess: brain, boils and carbuncles, dacryocystitis, epidural, lung, orbital, perirectal, pyogenic liver, tooth, surgical procedures through infected skin.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Percutaneous endoscopic gastrostomy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Does the patient have any of the conditions listed in Box 1?**

- **YES**  
  - Antibiotic prophylaxis for endocarditis NOT required.

- **NO**  
  - Antibiotic prophylaxis for endocarditis MAY be required.  
  See Box 2.
### Practice Points

#### Clindamycin administration
- IV infusion – should be commenced 30-60 minutes prior to the procedure. Administer doses of 600mg over at least 20 minutes (maximum rate is 30mg/min)

#### Vancomycin administration
- Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before the procedure at a recommended rate of 1g per hour (1.5g over 90 minutes).

### Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th><em>High risk penicillin/cephalosporin allergy</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dental procedures</strong></td>
<td>amoxicillin 2g PO 1 hour prior to procedure</td>
</tr>
<tr>
<td><strong>All other procedures</strong></td>
<td>amoxicillin 2g IV prior to procedure</td>
</tr>
</tbody>
</table>

### Definitions / Acronyms

- **DRESS**: Drug rash with eosinophilia and systemic symptoms
- **IV**: Intravenous
- **PO**: Per oral
- **SJS / TEN**: Stevens-Johnson syndrome / Toxic epidermal necrolysis

* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (e.g. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

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Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

For patients with cardiac conditions refer to Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis for further information.

Practice Points

Drug administration
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.
- IV infusion – should be commenced 30-60 minutes prior to incision (e.g. metronidazole). See below for vancomycin administration.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)
- Add vancomycin to cefazolin (see vancomycin administration below)

Vancomycin administration
- Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: infusion can be completed after skin incision.

Gentamicin administration
- Dosing should be based on ideal body weight, provided ideal body weight is less than actual body weight.

Repeat doses
A single pre-operative dose is sufficient for most procedures; however, repeat intra-operative doses (2g cefazolin) are advisable:
- for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
- if major blood loss occurs, following fluid resuscitation

Obese patients
- Consider increased dose (3g) of cefazolin if patient is obese (>120kg). Consult ID for advice

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
</table>
| Percutaneous Endoscopic Gastrostomy/Jejunostomy (PEG/PEJ) insertion/revision | cefazolin 2g IV (child: 30mg/kg up to 2g)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) | vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight)               |
|                                                                 |                                                                                       |                                                                                           |
| Endoscopic Retrograde Cholangiopancreatography (ERCP)                    | gentamicin 2mg/kg IV  
OR  
cefa zolin 2g IV (child: 30mg/kg up to 2g)  
PLUS consider adding  
metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) | gentamicin 2mg/kg IV  
PLUS consider adding  
metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) |
| Endoscopic ultrasound-guided fine-needle aspiration                       | metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg)  
PLUS  
cefa zolin 2g IV (child: 30mg/kg up to 2g)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) | metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg)  
PLUS  
gentamicin 2mg/kg IV  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) |
| All other procedures (with or without biopsy), e.g.                       | Prophylaxis NOT recommended                                                             |                                                                                           |
| > endoscopy > colonoscopy > sigmoidoscopy > sclerotherapy > oesophageal dilatation |                                                                                       |                                                                                           |
Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen accordingly to clinical condition and microbiological results.

Definitions / Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRESS</td>
<td>Drug rash with eosinophilia and systemic symptoms</td>
</tr>
<tr>
<td>ID</td>
<td>Infectious diseases</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous</td>
</tr>
<tr>
<td>MRSA</td>
<td>Methicillin-resistant <em>Staphylococcus aureus</em></td>
</tr>
<tr>
<td>SJS / TEN</td>
<td>Stevens-Johnson syndrome / Toxic epidermal necrolysis</td>
</tr>
</tbody>
</table>

* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

References


### Pre-Operative Considerations

Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of protheses, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

### Practice Points

**Drug administration**
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.
- IV infusion – should be commenced 30-60 minutes prior to incision (e.g. metronidazole). See below for vancomycin administration.

**MRSA risk** (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)
> Add vancomycin (see vancomycin administration below)

**Vancomycin administration**
> Give vancomycin 1g (1.5g for patients > 80kg actual body weight) started 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: infusion can be completed after skin incision.

**Gentamicin administration**
Dosing should be based on ideal body weight, provided ideal body weight is less than actual body weight.

**Repeat doses**
A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
- for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
- if major blood loss occurs, following fluid resuscitation

**Obese patients**
> Consider increased dose of cefazolin (3g) if patient obese (>120kg). Consult ID for advice.

### Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastric / duodenal / oesophageal (bypass, resection, ulcer oversew, oesophagectomy etc)</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g) PLUS *metronidazole 500mg IV (child: 12.5mg/kg up to 500mg) High risk of MRSA: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) *OMIT metronidazole if low risk as defined by: &gt; Upper GI surgery: normal gastric acidity/mobility; no obstruction, bleeding, or malignancy; no previous gastric surgery &gt; Biliary tract surgery: patient &lt; 60yrs of age; no diabetes; elective cholecystectomy with low risk of exploration of common bile duct</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS *metronidazole 500mg IV (child: 12.5mg/kg up to 500mg)</td>
</tr>
<tr>
<td>Biliary (incl. laparoscopic procedures)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal (colon/small bowel resection, revision of anastomosis/stoma, appendectomy etc.)</td>
<td>metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg) PLUS cefazolin 2g IV (child: 30mg/kg up to 2g) PLUS gentamicin 2mg/kg IV High risk of MRSA: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td>metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg) PLUS vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) PLUS gentamicin 2mg/kg IV</td>
</tr>
<tr>
<td>Pancreatic (Whipple’s etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver resection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exploratory laparotomy/division of adhesions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hernia repair</td>
<td>Prophylaxis NOT recommended when mesh is not inserted</td>
<td></td>
</tr>
<tr>
<td>Hernia repair with mesh insertion</td>
<td>cefazolin 2g (child: 30mg/kg up to 2g) IV High risk of MRSA: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td>vancomycin 1g IV(1.5mg for patients &gt; 80kg actual body weight)</td>
</tr>
</tbody>
</table>
Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen accordingly to clinical condition and microbiological results.

Definitions / Acronyms

DRESS  
Drug rash with eosinophilia and systemic symptoms

ID  
Infectious Diseases

IV  
Intravenous

MRSA  
Methicillin-resistant Staphylococcus aureus

SJS / TEN  
Stevens-Johnson syndrome / Toxic epidermal necrolysis

* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (e.g. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

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Pre-Operative Considerations

Prophylaxis is not indicated for intra-oral procedures: dentoalveolar surgery (extractions, impactions, exposures); minor pathology (soft tissue, cysts).

Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

*For patients with cardiac conditions refer to Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis for further information

Practice Points

Drug administration
> IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 30 minutes) [1]. Administration after skin incision or > 60 minutes before incision reduces effectiveness.
> IV infusion – should be timed to end ≤ 30 minutes before skin incision (e.g. see clindamycin below)

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of high risk hospital or unit (where MRSA is endemic) for more than the last five days)
> Add vancomycin to cefazolin (see vancomycin administration below).

Clindamycin administration
> Give clindamycin 600mg (child: 15 mg/kg up to 600mg) by IV infusion over at least 20 minutes, timed to end just before procedure. Repeat 4 hourly intra-operatively for prolonged procedures.

Vancomycin administration
> Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: infusion can be completed after skin incision.

Repeat doses
A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
> for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
> if major blood loss occurs, following fluid resuscitation

Obese patients
> Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
</table>
| **No incision** through mucosal (oral, nasal, pharyngeal, oesophageal) surface | cefazolin 2g IV (child: 30mg/kg up to 2g)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) | clindamycin 600mg IV infusion (child: 15mg/kg up to 600mg)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) |
| **With incision** through mucosal (oral, nasal, pharyngeal, oesophageal) surface | cefazolin 2g IV (child: 30mg/kg up to 2g)  
PLUS  
metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) | clindamycin 600mg IV infusion (child: 15mg/kg up to 600mg)  
High risk of MRSA :  
ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) |
| **Other uncomplicated or minor clean procedures** (e.g. tonsillectomy, adenoidectomy, typanostomy, nasal septoplasty, endoscopic sinus surgery, uncontaminated neck dissection) | Prophylaxis NOT recommended |

Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen accordingly to clinical condition and microbiological results.
Definitions / Acronyms

DRESS: Drug rash with eosinophilia and systemic symptoms
ID: Infectious Diseases
IV: Intravenous
MRSA: Methicillin-resistant Staphylococcus aureus
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Prophylaxis is not indicated for intra-oral procedures: dentoalveolar surgery (extractions, impactions, exposures); minor pathology (soft tissue, cysts).

Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

*For patients with cardiac conditions refer to Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis for further information

Practice Points

Drug administration
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.
- IV infusion – should be commenced 30-60 minutes prior to skin incision (e.g. metronidazole, clindamycin). See below for vancomycin administration.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)
- Add vancomycin (see vancomycin administration below).

Vancomycin administration
- Give vancomycin 1g (1.5g for patients > 80kg actual body weight) started 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

Clindamycin administration
- Give clindamycin 600mg (child: 15 mg/kg up to 600mg) by IV infusion over at least 20 minutes just before procedure. Repeat 4 hourly intra-operatively for prolonged procedures.

Repeat doses
A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
- for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
- if major blood loss occurs, following fluid resuscitation

Obese patients
- Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Orthognathic surgery</th>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>benzylpenicillin 1.2g IV (child &lt; 12 years: 30mg/kg up to 1.2g) THEN (for procedures greater than 2 hours duration) Repeat dose 2-hourly intra-operatively</td>
<td>clindamycin 600mg IV infusion (child: 15mg/kg up to 600mg)</td>
</tr>
</tbody>
</table>

| Skin approach procedures (oral cavity not involved) | cefazolin 2g IV (child < 12 years: 30mg/kg up to 2g) | clindamycin 600mg (child: 15mg/kg up to 600mg) by IV infusion, then 8-hourly for 24 hours |

| Skin approach procedures (with concurrent oral cavity involvement) | cefazolin 2g IV (child < 12 years: 30mg/kg up to 2g) PLUS metronidazole 500mg IV infusion (child < 12 years:12.5mg/kg up to 500mg) before incision, then 12-hourly for 24 hours | clindamycin 600mg (child: 15mg/kg up to 600mg) by IV infusion, then 8-hourly for 24 hours |

| Implants (1st stage) | benzylpenicillin 1.2g IV (child < 12 years: 30mg/kg up to 1.2g) before incision THEN 2-hourly intra-operatively (for procedures greater than 2 hours duration) | clindamycin 600mg (child: 15mg/kg up to 600mg) by IV infusion |
**Recommended Prophylaxis**

| Trauma |
|------------------|------------------|
| **Intraoral compound operation** (injury of any age, compound to nose/skin/sinuses) |
| **Recommended Prophylaxis** | **Recommended Prophylaxis** |
| benzylpenicillin 1.2g IV infusion (child < 12 years: 30mg/kg up to 1.2g) at presentation, then 4-hourly for 48 hours PLUS metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg) at presentation, then 12-hourly for 48 hours | clindamycin 600mg (child: 15mg/kg up to 600mg) by IV infusion, then 8-hourly for 48 hours |

**Post-Operative Care**

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiological results.

**Definitions / Acronyms**

- **DRESS**: Drug rash with eosinophilia and systemic symptoms
- **ID**: Infectious Diseases
- **IV**: Intravenous
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- **SJS / TEN**: Stevens-Johnson syndrome / Toxic epidermal necrolysis

*High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)*

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Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

*For patients with cardiac conditions refer to Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis for further information.

Practice Points

Wound irrigation

> Antibiotic solutions should NOT be used to irrigate the wound during surgery

Drug administration

> IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.

> IV infusion – vancomycin infusion should be commenced 30-120 minutes prior to incision. See vancomycin administration below.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)

> Add vancomycin to cefazolin (see vancomycin administration below)

Vancomycin administration

> Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

Repeat doses

A single pre-operative dose is sufficient for most procedures; however, repeat intra-operative doses are advisable:

> for prolonged surgery (> 3 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR

> if major blood loss occurs, following fluid resuscitation

Obese patients

> Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craniotomy procedures</td>
<td></td>
</tr>
<tr>
<td>Trans-sphenoidal procedures</td>
<td></td>
</tr>
<tr>
<td>Spinal procedures (laminectomy)</td>
<td></td>
</tr>
<tr>
<td>CSF shunt / drain procedures</td>
<td></td>
</tr>
<tr>
<td>External ventricular drain shunt</td>
<td></td>
</tr>
<tr>
<td>Other minor clean procedures</td>
<td>Prophylaxis NOT recommended</td>
</tr>
</tbody>
</table>

Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiological results.

Definitions / Acronyms

| CSF | Cerebrospinal fluid |
| DRESS | Drug rash with eosinophilia and systemic symptoms |
| ID | Infectious Diseases |
| IV | Intravenous |
| MRSA | Methicillin-resistant Staphylococcus aureus |
| SJS / TEN | Stevens-Johnson syndrome / Toxic epidermal necrolysis |

* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)
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Pre-Operative Considerations

Consider individual risk factors for every patient – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

Before hysterectomy – screening for and treating bacterial vaginosis (BV) reduces BV-associated cuff infection.

Before surgical termination of pregnancy – screening for and treating Chlamydia trachomatis and BV reduces infectious complications.

Practice Points

Drug administration
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.
- IV infusion – should be commenced 30-60 minutes prior to skin incision (e.g. metronidazole, clindamycin). See below for vancomycin administration.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)
- Add vancomycin to cefazolin (see vancomycin administration below)

Clindamycin administration
- Give clindamycin 600mg (child: 15mg/kg up to 600mg) by IV infusion over at least 20 minutes just before procedure. Repeat 4 hourly intra-operatively for prolonged procedures.

Vancomycin administration
- Give vancomycin 1g (1.5g for patients > 80kg actual body weight) started 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

Gentamicin administration
Dosing should be based on ideal body weight, provided ideal body weight is less than actual body weight.

Repeat doses
- A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
  - for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
  - if major blood loss occurs, following fluid resuscitation.

Obese patients
- Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
</table>
| Hysterectomy, laparotomy procedures, vaginal repair | cefazolin 2g IV 15-30 mins prior to incision
PLUS either (for vaginal hysterectomy)  
metronidazole 500mg IV infusion
OR  
tinidazole 2g PO as a single dose (6-12hrs prior to incision)
High risk of MRSA: 
Add cefazolin with vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) | clindamycin 600mg IV infusion
PLUS  
gentamicin 2 mg/kg IV |
| Caesarean section                | cefazolin 2g IV 15-30 mins prior to incision
High risk of MRSA: 
Add cefazolin with vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) | clindamycin 600mg IV infusion
PLUS  
gentamicin 2mg/kg IV |
| Endoscopic procedures, IUD insertion, early suction termination, other minor procedures | Prophylaxis NOT recommended | Capnocytophaga, Pasteurella, and other beta-haemolytic streptococci |
**Post-Operative Care**

Except where included above, post-operative antibiotics are **NOT** indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiological results.

**Additional notes**

**Caesarian section:** Traditionally administration of antibiotics after the cord is clamped has been common practice to avoid exposing the neonate to antibiotics. However, recent studies have shown lower surgical site infection rates, without compromising neonatal outcome, if prophylaxis is administered before skin incision.

**Definitions / Acronyms**

- **DRESS** Drug rash with eosinophilia and systemic symptoms
- **ID** Infectious Diseases
- **IV** Intravenous
- **MRSA** Methicillin-resistant *Staphylococcus aureus*
- **SJS / TEN** Stevens-Johnson syndrome / Toxic epidermal necrolysis

* High risk penicillin/cephalosporin allergy: History suggestive of high risk (e.g. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

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Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

Practice Points

Drug administration
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 30 minutes) [1]. Administration after skin incision or > 60 minutes before incision reduces effectiveness [2].
- IV infusion – should be timed to end ≤ 30 minutes before skin incision (e.g. see clindamycin below)

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)
- See recommended prophylaxis

Clindamycin administration
- Give clindamycin 600mg (child: 10mg/kg up to 450mg) single dose IV infusion at a rate ≤ 30mg/minute. The IV infusion should be timed to end ≤ 30 minutes before skin incision.

Obese patients
- Consider increased dose of cefazolin (3g) if patient is obese (>120kg).

Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>All procedures</td>
<td></td>
</tr>
<tr>
<td>Pre-operatively; Immediately prior to surgical incision, apply sterile povidone-iodine 5% swab to conjunctival cul de sac, lid margins and periorbital skin and dry at 2 minutes. In patients with a povidone iodine (Betadine®) allergy, use a sterile product containing chlorhexidine acetate 0.05% for 5 minutes [3].</td>
<td></td>
</tr>
</tbody>
</table>

Extra-ocular procedures

Clean procedures
- conjunctival procedures
- rectus / oblique muscle procedures
- entropion / ectropion repair

There is no strong evidence that IV prophylactic antibiotics improve outcomes for clean extra-ocular procedures in otherwise healthy individuals. If required, use:

<table>
<thead>
<tr>
<th>cepazolin 2g IV (child: 30mg/kg up to 2g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High risk of MRSA infection: REPLACE cepazolin with clindamycin 600mg IV infusion</td>
</tr>
<tr>
<td>clindamycin 600mg IV infusion (child: 10mg/kg up to 450mg)</td>
</tr>
</tbody>
</table>

Procedures where infection may be present (e.g. Dacryocystorhinostomy)

No strong evidence for IV prophylaxis (as above). Chloramphenicol 0.5% eye drops four times a day post-operatively for 7 days. [4]

Intra-ocular procedures

Anterior procedures
- phacoemulsification / lens implant
- keratoplasty
- trabeculectomy / tube implant
- corneal graft

<table>
<thead>
<tr>
<th>cefazolin 1mg/0.1ml intracameral injection at the end of the procedure PLUS chloramphenicol 0.5% eye drops four times a day post-operatively for one week</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR, if chloramphenicol contraindicated then: tobramycin 0.3% eye drops four times a day post-operatively for one week</td>
</tr>
</tbody>
</table>

Vitreous procedures
- retinal detachment repair
- scleral buckle
- cryotherapy

<table>
<thead>
<tr>
<th>ceftazidine 2.25 mg/0.1 mL subconjunctival injection at the end of the procedure PLUS chloramphenicol 0.5% eye drops four times a day post-operatively for one week</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR if chloramphenicol contraindicated then: tobramycin 0.3% eye drops four times a day post-operatively for one week</td>
</tr>
</tbody>
</table>

Seek ID advice:
Intracameral moxifloxacin 0.5% (available by SAS only) may be considered as an alternative to ceftazidine / cephalosporin based on evidence presented in a meta-analysis of non-randomised studies [5, 6]. Intracameral vancomycin is not recommended due to the risk of haemorrhagic occlusive retinal vasculitis [7].
Post-Operative Care

There is a lack of strong evidence to support the use of post-operative topical antibiotics [4]. Prolonged treatment with antibiotic ointment or drops is not indicated unless there is confirmed or suspected infection. For patients who are treated with extended periods of topical steroids or who have been treated with systemic steroids preoperatively, immunological defenses may be reduced and the risk of infection may be increased [9]. If post-operative topical antibiotics are considered necessary due to higher risk of infection, chloramphenicol 0.5% eyedrops can be used four times daily for 7 days [4]. Tobramycin eyedrops should only be used in patients hypersensitive to chloramphenicol due to an increased risk of resistance [4]. If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.

Definitions / Acronyms

DRESS Drug rash with eosinophilia and systemic symptoms
IV Intravenous
MRSA Methicillin-resistant Staphylococcus aureus
SJS / TEN Stevens-Johnson syndrome / Toxic epidermal necrolysis
* High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

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Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision

Practice Points

Drug administration

> IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15 to 30 minutes). Commencing administration of any antibiotic after skin incision or completing administration of antibiotics > 60 minutes before incision reduces effectiveness.
> IV infusion – should be commenced 30-120 minutes prior to skin incision. See below for vancomycin administration.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of high risk hospital or unit (where MRSA is endemic) for more than the last five days)
> Add vancomycin to cefazolin (see vancomycin administration below)

Vancomycin administration

> Give vancomycin 1g (1.5g for patients > 80kg actual body weight) started 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

Repeat doses
A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
> for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
> if major blood loss occurs, following fluid resuscitation

Obese patients
> Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

Duration of prophylaxis should not exceed 24hrs, irrespective of presence of drains or catheters

Recommended Prophylaxis

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<tr>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Total Hip Replacement (THR)</strong> OR <strong>Total Knee Replacement (TKR)</strong></td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g) before incision, then 8-hourly for 2 more doses <strong>High risk of MRSA:</strong> ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td><strong>Patients requiring revision / re-operation</strong></td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g) before incision, then 8-hourly for 2 more doses PLUS vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight) AND also (if cement is used) vancomycin added to tobramycin or gentamicin bone cement (≤ 5% w:w) (add vancomycin 500mg per 40g packet of bone cement)</td>
</tr>
<tr>
<td><strong>Morcellised allografting at joint replacement</strong></td>
<td>Add approximately 250mg vancomycin to bone cement for first femoral head equivalent, and 500mg for more than one head, and no more than 500mg to graft</td>
</tr>
<tr>
<td><strong>Routine arthroscopic procedures</strong></td>
<td>No prophylaxis required (unless prosthesis is being inserted or patient is immunocompromised)</td>
</tr>
</tbody>
</table>
Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen accordingly to clinical condition and microbiological results.

Definitions / Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
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<td>DRESS</td>
<td>Drug rash with eosinophilia and systemic symptoms</td>
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<td>MRSA</td>
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<td>SJS / TEN</td>
<td>Stevens-Johnson syndrome / Toxic epidermal necrolysis</td>
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This guideline does not apply to open fractures.

### Pre-Operative Considerations

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**Pre-existing infections (known or suspected)** – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision

### Practice Points

**Drug administration**
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 30 minutes). Administration after skin incision or > 60 minutes before incision reduces effectiveness
- IV infusion – should be commenced 30-60 minutes prior to skin incision (e.g. metronidazole). See below for vancomycin administration

**MRSA risk** (defined as history of MRSA colonisation or infection, OR inpatient of high risk hospital or unit (where MRSA is endemic) for more than the last five days)
- Add vancomycin to cefazolin (see vancomycin administration below)

**Vancomycin administration**
- Give vancomycin 1g (1.5g for patients > 80kg actual body weight) started 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

**Repeat doses**
- A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
  - for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
  - if major blood loss occurs, following fluid resuscitation

**Obese patients**
- Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

**Duration of prophylaxis** should not exceed 24hrs, irrespective of presence of drains or catheters.

### Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th><em>High risk penicillin/cephalosporin allergy</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal fixation of large bones</strong></td>
<td>cefazolin 2g IV (child &lt;12 years: 30mg/kg up to 2g) THEN repeat 8-hourly for 2 further doses. (Max 3 doses irrespective of the presence of surgical drains) High risk of MRSA: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td><strong>Other (closed) internal fixation</strong></td>
<td>cefazolin 2g IV (child &lt; 12 years: 30mg/kg up to 2g) High risk of MRSA: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td><strong>Arthroscopic and other clean procedures not involving foreign material (e.g. pins, plates)</strong></td>
<td>Prophylaxis NOT recommended</td>
</tr>
<tr>
<td><strong>Lower limb amputation</strong></td>
<td>cefazolin 2g IV (child &lt; 12 years: 30mg/kg up to 2g) THEN repeat 8-hourly for up to 2 further doses High risk of MRSA: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
</tbody>
</table>

If limb is ischaemic
- ADD to above metronidazole 500mg IV infusion (child < 12 years: 12.5mg/kg up to 500mg), may be repeated after 12 hours
Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal procedures</td>
<td><strong>Cefazolin 2g IV</strong> (child &lt; 12 years: 30mg/kg up to 2g) High risk of MRSA: ADD <strong>Vancomycin 1g IV infusion</strong> (1.5g for patients &gt; 80kg actual body weight), may be repeated after 12 hours</td>
</tr>
</tbody>
</table>

Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiological results.

Definitions / Acronyms

- **DRESS**: Drug rash with eosinophilia and systemic symptoms
- **ID**: Infectious Diseases
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Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

Practice Points

Unless otherwise stated, antibiotic prophylaxis is NOT required for the following plastic surgery indications:
> Clean elective surgery with no implants
> Clean trauma with no fracture and less than 24 hours since injury

Drug administration
> IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 15-30 minutes). Administration after skin incision or > 60 minutes before incision reduces effectiveness
> IV infusion – vancomycin should be commenced 30-120 minutes prior to skin incision. See under vancomycin administration.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of high risk hospital or unit (where MRSA is endemic) for more than the last five days)
> Add vancomycin to cefazolin

Vancomycin administration
> Give vancomycin 1g (1.5g for patients > 80kg actual body weight) started 30 to 120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

Repeat doses
A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
> for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
> if major blood loss occurs, following fluid resuscitation

Obese patients
> Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

Topical antibiotics should NOT be applied to the wound during or after surgery

Recommended Prophylaxis

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<tr>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groin/axilla/neck dissections</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
</tr>
<tr>
<td>Open reduction and internal fixation of fractures</td>
<td>High risk of MRSA infection: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td>Insertion of implants, mesh, prostheses, screws, plates etc.</td>
<td>Prophylaxis NOT recommended</td>
</tr>
<tr>
<td>Clean bone or soft tissue injury</td>
<td></td>
</tr>
<tr>
<td>Hand surgery (without implants)</td>
<td></td>
</tr>
<tr>
<td>Non-infected lesions &amp; minor excisions</td>
<td></td>
</tr>
</tbody>
</table>

Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.

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Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

*For patients with cardiac conditions refer to Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis for further information

Practice Points

Drug administration
- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 30 minutes). Administration after skin incision or > 60 minutes before incision reduces effectiveness
- IV infusion – should be commenced 30-60 minutes prior to skin incision (e.g. metronidazole). See below for vancomycin administration.

MRSA risk (defined as history of MRSA colonisation or infection, OR inpatient of metropolitan or other high risk hospital for more than the last five days)
- Add vancomycin to cefazolin

Vancomycin administration
- Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

Repeat doses
- A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:
  - for delayed or prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
  - if major blood loss occurs, following fluid resuscitation

Obese patients
- Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

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<thead>
<tr>
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</tr>
</thead>
</table>
| **Pneumonectomy / Lobectomy**
  cefazolin 2g IV (child: 30mg/kg up to 2g)
  THEN
  cefazolin 2g IV (child: 30mg/kg up to 2g) 8-hourly for 2 more doses commencing 4 hours after the initial dose
  If anaerobic cover required (empyema or abscess) then ADD:
    metronidazole 500mg IV infusion (child: 12.5mg/kg), repeated 12 hourly for 2 more doses commencing 6 hours after initial dose
  High risk of MRSA infection:
    ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight)
  vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight)
  THEN
  vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight) 12 hourly for 2 more doses commencing 8 hours after the initial dose
  If anaerobic cover required (empyema or abscess) then ADD:
    metronidazole 500mg IV infusion (child: 12.5mg/kg), repeated 12 hourly for 2 more doses commencing 6 hours after initial dose
|**Decortication / Pleurectomy**
  cefazolin 2g IV (child: 30mg/kg up to 2g)
  If anaerobic cover required ADD:
    metronidazole 500mg IV infusion (child: 12.5mg/kg)
  High risk of MRSA infection:
    ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight)
  vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight)
  If anaerobic cover required ADD:
    metronidazole 500mg IV infusion (child: 12.5mg/kg)
|**Video-assisted thoracoscopic surgery (VATS)**
  cefazolin 2g IV (child: 30mg/kg up to 2g)
  High risk of MRSA infection:
    ADD vancomycin 1g IV infusion (1.5g for patients > 80kg actual body weight)
  vancomycin 1g by IV infusion (1.5g for patients > 80kg actual body weight)
Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.

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MRSA   Methicillin-resistant Staphylococcus aureus  
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*  High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

References


Endorsed by South Australian expert Advisory Group on Antibiotic Resistance (SAAGAR) March 2012, Last reviewed and amended August 2017  
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**Pre-Operative Considerations**

*Consider individual risk factors for every patient* – need for prophylaxis, drug choice or dose may alter (e.g. immune suppression, presence of prostheses, urinary catheters or stents, allergies, obesity, diabetes, remote infection, available pathology or malignancy).

*Pre-existing infections (known or suspected)* – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure. Doses should be scheduled to allow for re-dosing just prior to skin incision.

*Pre-operative urine screening*: Where possible exclude or treat urinary infection prior to surgery. If surgery is urgent in the presence of confirmed infection or bacteriuria, use gentamicin 3mg/kg IV as a single preoperative dose. Higher doses may be required if systemic symptoms are present.

*For patients with cardiac conditions refer to Antibiotic Prophylaxis Guidelines for Prevention of Endocarditis* for further information.

**Practice Points**

**Drug administration**

- IV bolus – should be timed ≤ 60 minutes before skin incision (optimal 30 minutes). Administration after skin incision or > 60 minutes before incision reduces effectiveness
- IV infusion – should be commenced 30-60 minutes prior to skin incision (e.g. metronidazole). See below for vancomycin administration.

**MRSA risk** (defined as history of MRSA colonisation or infection, OR inpatient of high risk hospital or unit (where MRSA is endemic) for more than the last five days)

- Add vancomycin to cefazolin (see vancomycin administration below)

**Vancomycin administration**

- Give vancomycin 1g (1.5g for patients >80kg actual body weight) by IV infusion started 30-120 minutes before surgical incision and given at a recommended rate of 1g per hour (1.5g over 90 minutes). Note: Infusion can be completed after skin incision.

**Gentamicin administration**

- Dosing should be based on ideal body weight, provided ideal body weight is less than actual body weight.

**Repeat doses**

A single pre-operative dose is sufficient for most procedures, however repeat intra-operative doses are advisable:

- for prolonged surgery (> 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin), OR
- if major blood loss occurs, following fluid resuscitation

**Obese patients**

- Consider increased dose of cefazolin (3g) if patient is obese (>120kg). Consult ID for advice.

**Recommended Prophylaxis**

<table>
<thead>
<tr>
<th>Recommended Prophylaxis</th>
<th><em>High risk penicillin/cephalosporin allergy</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open/laparoscopic procedures when:</strong></td>
<td><strong>cefazolin 2g IV (child: 30mg/kg up to 2g)</strong></td>
</tr>
<tr>
<td></td>
<td>PLUS</td>
</tr>
<tr>
<td></td>
<td>gentamicin 2mg/kg IV (adults and children)</td>
</tr>
<tr>
<td></td>
<td>If risk of entry into bowel lumen then ADD:</td>
</tr>
<tr>
<td></td>
<td>metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg)</td>
</tr>
<tr>
<td></td>
<td>High risk of MRSA:</td>
</tr>
<tr>
<td></td>
<td>ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td><strong>Open/laparoscopic procedures when urinary tract not entered and urine is sterile (e.g. vasectomy, scrotal surgery, varicocele ligation)</strong></td>
<td><strong>Prophylaxis NOT recommended</strong></td>
</tr>
</tbody>
</table>
### Recommended Prophylaxis

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Recommended Prophylaxis</th>
<th>*High risk penicillin/cephalosporin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open prostatectomy / Robotic prostatectomy</strong></td>
<td>cefazolin 2g IV</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td></td>
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<td>metronidazole 500mg IV</td>
<td>metronidazole 500mg IV</td>
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<tr>
<td></td>
<td>High MRSA risk: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td><strong>Endoscopic procedures</strong></td>
<td><strong>Recommended Prophylaxis</strong></td>
<td><strong>Recommended Prophylaxis</strong></td>
</tr>
<tr>
<td>&gt; removal of calculi</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
<td>gentamicin 2mg/kg IV (adults and children)</td>
</tr>
<tr>
<td>&gt; Extracorporeal Shock Wave Lithotripsy only if high risk of infection</td>
<td>Known urinary MRSA colonisation: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td>Known urinary MRSA colonisation: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td>&gt; specific risk for postoperative infection</td>
<td><strong>Recommended Prophylaxis</strong></td>
<td><strong>Recommended Prophylaxis</strong></td>
</tr>
<tr>
<td><strong>Removal of calculi</strong></td>
<td>gentamicin 2mg/kg IV (adults and children) OR (if gentamicin contraindicated)</td>
<td>gentamicin 2mg/kg IV (adults and children) OR (if gentamicin contraindicated)</td>
</tr>
<tr>
<td>Transurethral resection of prostate (TURP)</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g)</td>
<td>trimethoprim 300mg PO 1hr prior to insertion</td>
</tr>
<tr>
<td>Stent insertion</td>
<td>Known urinary MRSA colonisation: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td>Known urinary MRSA colonisation: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td>Ureteroscopy/instrumentation of upper tract (incl. retrograde pyelogram)</td>
<td><strong>Recommended Prophylaxis</strong></td>
<td><strong>Recommended Prophylaxis</strong></td>
</tr>
<tr>
<td>Transperineal prostatic biopsy</td>
<td>cefazolin 2g IV</td>
<td>vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
</tr>
<tr>
<td>High MRSA risk: ADD vancomycin 1g IV infusion (1.5g for patients &gt; 80kg actual body weight)</td>
<td><strong>Recommended Prophylaxis</strong></td>
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<tr>
<td>Transrectal prostatic biopsy</td>
<td>ciprofloxacin 500mg PO as a single dose, 1-2 hours before procedure. Dose may be repeated 12 hours after the first dose if procedure delayed beyond 6 hours</td>
<td><strong>Recommended Prophylaxis</strong></td>
</tr>
<tr>
<td>If there is a history of overseas travel (India, South East Asia, Southern Europe) in the last 6 months, the patient may be colonised with multi-resistant organisms. Contact ID/Clinical Microbiology for advice.</td>
<td><strong>Recommended Prophylaxis</strong></td>
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<tr>
<td>Other clean procedures / diagnostic cystoscopy without manipulation of urinary tract</td>
<td>Prophylaxis NOT recommended</td>
<td><strong>Recommended Prophylaxis</strong></td>
</tr>
</tbody>
</table>

### Post-Operative Care

Except where included above, post-operative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains.

If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.

### Definitions / Acronyms

**DRESS**
- Drug rash with eosinophilia and systemic symptoms

**ID**
- Infectious Diseases

**IV**
- Intravenous

**MRSA**
- Methicillin-resistant *Staphylococcus aureus*

**PO**
- Per oral

**SJS / TEN**
- Stevens-Johnson syndrome / Toxic epidermal necrolysis

*High Risk penicillin/cephalosporin allergy: History suggestive of high risk (eg. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)*
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<td><strong>Vascular reconstruction</strong> (e.g. abdominal aorta, graft/stent insertion, groin incision)</td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g), repeated 8-hourly for 2 further doses post-operatively <strong>High risk of MRSA</strong>: ADD vancomycin 1g IV infusion (1.5g for patients &gt;80kg actual body weight)</td>
<td>vancomycin 1g IV infusion (1.5g &gt;80kg actual body weight), may repeat 12 hours after initial dose</td>
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<td><strong>Amputation of ischaemic limb</strong></td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g) repeated 8-hourly for 2 further doses post-operatively PLUS metronidazole 500mg IV infusion (child: 12.5mg/kg up to 500mg), repeated 12 hours after initial dose <strong>High risk of MRSA</strong>: ADD vancomycin 1g IV infusion (1.5g for patients &gt;80kg actual body weight)</td>
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<td><strong>Primary autogenous arteriovenous fistula (AVF) formation</strong></td>
<td>No prophylaxis required</td>
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<td><strong>AVF revision or AVF with insertion of prosthetic material (e.g. Dacron graft)</strong></td>
<td>cefazolin 2g IV (child: 30mg/kg up to 2g) <strong>High risk of MRSA</strong>: ADD vancomycin 1g IV infusion (1.5g for patients &gt;80kg actual body weight)</td>
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<td><strong>All other clean procedures</strong> (e.g. thoracoscopic sympathectomy)</td>
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