Note:
This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient’s medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

This is a High Risk Medication
An overdose can cause permanent toxicity.

Checklist

Before administering a dose:

- A trough level should be done within one hour prior to the dose. Do not wait for levels to give the next dose.
- Check the date and time when the next blood level is required; and
- Document the ongoing plan in the Nursing Care Plan and/or Medication Chart.
**Dose and Indications**

**Infection due to susceptible organisms**

**Intravenous Intermittent Infusion**

<table>
<thead>
<tr>
<th>Corrected Age (weeks)</th>
<th>Postnatal Age (days)</th>
<th>Dose (mg/kg)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30</td>
<td>0-7</td>
<td>10</td>
<td>Every 12 hours</td>
</tr>
<tr>
<td></td>
<td>&gt;7</td>
<td>10</td>
<td>Every 8 hours</td>
</tr>
<tr>
<td>30-36</td>
<td>0-7</td>
<td>15</td>
<td>Every 12 hours</td>
</tr>
<tr>
<td></td>
<td>&gt;7</td>
<td>15</td>
<td>Every 8 hours</td>
</tr>
<tr>
<td>≥ 37</td>
<td>All Ages</td>
<td>25</td>
<td>Every 12 hrs</td>
</tr>
</tbody>
</table>

**Intravenous Continuous Infusion** – Recommended in serious bacterial infections including Central Nervous System infections, endocarditis, osteomyelitis and sepsis where vancomycin is the only available treatment option.

<table>
<thead>
<tr>
<th>Corrected Age (weeks)</th>
<th>Postnatal age (days)</th>
<th>Loading Dose (mg/kg)</th>
<th>Maintenance Dose (mg/kg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30</td>
<td>0-7</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>&gt;7</td>
<td>10</td>
<td>30</td>
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<td>10</td>
<td>35</td>
</tr>
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<td>≥ 37</td>
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<td>15</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>&gt;7</td>
<td>15</td>
<td>35</td>
</tr>
</tbody>
</table>
Preparation and Administration

There are **TWO STEPS** to this process.

| STEP ONE: Add 10mL of Water for Injection to the vial (500mg) and shake gently to dissolve (total of 10mL). The resulting solution contains **50mg/mL** vancomycin.  
*The reconstituted solution is stable for 24 hours stored under refrigeration – check with local policy about re-accessing vial for the same patient.*  
**STEP TWO:** Further dilute 2mL of the 50mg/mL vancomycin solution with 18mL of compatible fluid (total of 20mL). The resulting solution contains **5mg/mL** vancomycin. |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose</td>
<td>5mg</td>
<td>10mg</td>
<td>20mg</td>
<td>30mg</td>
<td>40mg</td>
<td>50mg</td>
<td>60mg</td>
</tr>
<tr>
<td>Volume</td>
<td>1mL</td>
<td>2mL</td>
<td>4mL</td>
<td>6mL</td>
<td>8mL</td>
<td>10mL</td>
<td>12mL</td>
</tr>
</tbody>
</table>

Discard remaining solution from the second dilution.

**Intravenous Intermittent Infusion**

Infuse over at least 2 hours.

**Intravenous Continuous Infusion:** Make separate syringes for loading and maintenance doses

**Loading dose:** Infuse over 2 hours

**Maintenance Dose:** Start the maintenance dose after the loading dose is finished. Calculate the total maintenance dose and administer over 24 hours

Withdraw only the required dose in a syringe and infuse over 24 hours

Small doses may be further diluted (up to 2mg/mL) if required, for ease of administration.

**Compatible Fluids**

Glucose 5%, Glucose 10%, Sodium chloride 0.9%

**Adverse Effects**

**Common**

Thrombophlebitis, nephrotoxicity (more common when administered with other nephrotoxic drugs such as aminoglycosides)

**Rare**

- “Red man” syndrome (see practice points)
- Thrombocytopenia, neutropenia, leucopenia
- Ototoxicity (more common when administered for extended periods of time, in impaired renal function and when given with other ototoxic medications such as aminoglycosides).
Monitoring

For Intermittent infusions

> If duration of therapy is likely to exceed 48 hours, liaise with Infectious Disease team to coordinate therapeutic drug monitoring. Consider the timing of levels and the likelihood of results returning out of hours.

<table>
<thead>
<tr>
<th>Level</th>
<th>Next Level Taken</th>
<th>Target Trough Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Level</td>
<td>8-hourly - dosing just prior to the</td>
<td>Currently there is insufficient evidence to</td>
</tr>
<tr>
<td>OR</td>
<td>6th dose</td>
<td>determine appropriate target trough ranges for</td>
</tr>
<tr>
<td>After change of dose</td>
<td>12-hourly dosing - just prior to the</td>
<td>intermittent infusion in neonatal patients.</td>
</tr>
<tr>
<td>Ongoing monitoring</td>
<td>Trough level every 3 days</td>
<td>A suggested target trough range is <strong>10-15mg/L</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If levels fall outside this range, seek Infectious</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diseases advice</td>
</tr>
</tbody>
</table>

> Consider taking trough level earlier if concerns regarding renal function
> Blood levels will need repeating if a drug dose is altered or if the infant’s clinical situation (i.e. renal failure) is likely to lead to unpredictable levels
> Consider more frequent monitoring if renal function declines or on other nephrotoxic medications
> Full blood count periodically, particularly with prolonged therapy.
> Trough level can be interpreted in context with MIC values for the organism being treated in conjunction with Infectious Diseases team

For Continuous infusions

> Target level at 24 hours after starting the infusion is **15-20mg/L** - or as directed by Infectious Disease Team.
> The timing is not critical and samples could be drawn at the same time as “routine” bloods.
> Trough level can be interpreted in context with MIC values for the organism being treated in conjunction with Infectious Diseases team
> If dose adjustment required:
  > New adjusted dose (mg) = \( \frac{20}{20} \times \text{Last maintenance dose (mg)} \)
  > Last measured vancomycin level (mg/L)

Practice Points

> Vancomycin may induce nephrotoxicity and ototoxicity, although uncommon these are more often seen when given in conjunction with other nephrotoxic/ototoxic medications
> Use with caution in patients with renal impairment and adjust the dose where necessary.
> “Red man” syndrome symptoms include erythema, flushing, facial and upper torso rash,
which may be followed by hypotension, angioedema and itch. The effect is largely due to
histamine release after too rapid an IV infusion

- Vancomycin is very irritant to tissue and may cause necrosis if extravasated
- Y-site compatibility has been demonstrated between vancomycin and some parental
  nutrition preparations, consult your pharmacist for further advice

Reference

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   pharmacokinetic analysis of vancomycin in neonates. A new proposal of initial dosage
4. Gian Maria Pacifici; Karel Allegaert. Clinical pharmacokinetics of vancomycin in the
   neonate: a review, Clinics vol.67 no.7 São Paulo July 2012
5. de Hoog M, Mouton JW, van den Anker JN Vancomycin: pharmacokinetics and
   continuous infusion in neonates: dosing optimisation and therapeutic drug monitoring.