This document is applicable at site(s):
All Sites

Bottom line: Use guideline based Vancomycin dosing and monitoring to maximize treatment success and reduce unnecessary plasma Vancomycin levels and needless dosage changes.

**Adult Dosing Recommendations:**

**Loading dose:**
- Use a loading dose in:
  - Serious infections where rapid attainment of target trough level of 15-20 mg/L is desired, e.g. vertebral osteomyelitis, MRSA pneumonia, epidural abscess, septic shock.
  - Patients with significant renal dysfunction in order to decrease the time required to attain target trough level.
- 25-30 mg/kg (based on actual body weight; no maximum dose) single dose, followed by maintenance dose separated by recommended dosing interval.

**Maintenance dose:**
- 15 mg/kg (based on actual body weight) dose (maximum of 2 g/dose)
  - Doses >500 mg – round to nearest 250 mg.
  - Doses <500 mg – round to nearest 50 mg.

**Dosing interval:**

<table>
<thead>
<tr>
<th>Calculated Creatinine Clearance (CRCL) (mL/min)</th>
<th>Dosing Interval for trough 10-20 mg/L</th>
<th>Dosing Interval for trough 15-20 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥80</td>
<td>q12h</td>
<td>q8h</td>
</tr>
<tr>
<td>40 - 80</td>
<td>q24h</td>
<td>q12h</td>
</tr>
<tr>
<td>20 - 40</td>
<td>q36h</td>
<td>q24h</td>
</tr>
<tr>
<td>10 - 20</td>
<td>q48h</td>
<td>q48h</td>
</tr>
<tr>
<td>&lt;10</td>
<td>Consider loading dose. Obtain pharmacist consult.</td>
<td></td>
</tr>
</tbody>
</table>

For more details and pediatric dosing, see [http://bugsanddrugs.albertahealthservices.ca](http://bugsanddrugs.albertahealthservices.ca)

**Monitoring:**
- Peak (post) levels are NOT recommended.
- Trough (pre) levels (taken 30 minutes or less prior to next dose) are recommended in:
  - Patients with deteriorating/unstable renal function (increase in baseline serum creatinine of 40 µmol/L or greater, or increase of 50% or more from baseline).
  - Morbidly obese patients (190% or greater of ideal body weight, or BMI 40 kg/m² or greater).
  - Patients with anticipated therapy ≥ 7 days.
  - Patients who are severely ill (e.g. sepsis) and/or require target trough of 15-20 mg/L (see table on next page).
  - Patients with altered volume of distribution or clearance of vancomycin (e.g. cystic fibrosis, pediatrics, elderly 60 years or older, cancer, burns more than 20% body surface area).
  - Selected dialysis patients (e.g. high flux and continuous hemodialysis/filtration).
Vancomycin Monitoring and Dosing Guideline

<table>
<thead>
<tr>
<th>Infection</th>
<th>Desired Trough Level (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteomyelitis</td>
<td>15-20</td>
</tr>
<tr>
<td>Pneumonia</td>
<td></td>
</tr>
<tr>
<td>CNS infections</td>
<td></td>
</tr>
<tr>
<td>Endocarditis</td>
<td></td>
</tr>
<tr>
<td>Bacteremia</td>
<td></td>
</tr>
<tr>
<td>Serious MRSA infections</td>
<td>10-20</td>
</tr>
<tr>
<td>Other infections</td>
<td></td>
</tr>
</tbody>
</table>

- First trough level should be taken at steady state* and after at least 2 maintenance doses (~30 hours if normal renal function, prior to 4th dose if q12h, or prior to 5th dose if q8h.)
  - Vancomycin clearance is enhanced in obesity. For morbidly obese patients, consider drawing first level sooner (e.g. before 2nd or 3rd dose).

- Subsequent trough levels:
  - With dosage change: trough should be taken at new steady state* as described above.
  - Once target trough achieved: trough should be taken every 7-10 days in hemodynamically stable patients; may need more frequently if hemodynamically unstable, renal function changing, or patient is on concurrent nephrotoxic drugs.

- NB: Do NOT hold next vancomycin dose while waiting for results of plasma levels unless there is a specific order to do so, e.g. because of concerns of toxicity/adverse events and/or significant decline in kidney function.

  *Steady state* (SS) occurs in 4 to 5 half-lives and can be estimated for vancomycin by using the following equations:

  \[
  k_e = CRCL \times 0.00083 + 0.0044 \\
  t_{1/2} = \frac{0.693}{k_e} \\
  SS = 4 \text{ to } 5 \times t_{1/2}
  \]

References