Guidelines for the use of vancomycin by continuous infusion in critical care areas

Introduction
The efficacy of vancomycin is dependant on the time for which the serum concentration exceeds the minimum inhibitory concentration (MIC). High peaks are not associated with improved bactericidal effects and may be associated with increased toxicity. There is evidence that administration of vancomycin by continuous infusion is as effective as intermittent infusion whilst being simpler in terms of monitoring requirements.

Inclusion criteria
Only patients in the areas listed below may be treated with vancomycin by continuous infusion:
- Intensive Care Unit (ICU)
- High Dependency Unit (HDU)

For general contraindications to vancomycin, refer to the current edition of the British National Formulary (BNF) or the online version [http://www.bnf.org/bnf/](http://www.bnf.org/bnf/) or discuss with a pharmacist. Haemofiltration is not a contraindication.

Dose and administration

Loading dose
All patients who are not already on vancomycin should receive an ideal body weight-related loading dose as shown in table 1 below.

| IBW <65 kg | 1g IV in 250ml 0.9% sodium chloride over 2 hours |
| IBW >65 kg | 1.5g IV in 250ml 0.9% sodium chloride over 2 hours |

| Ideal body weight (IBW) = f + (2.3 x inches > 5 ft) |
| (f = 50kg (male), 45.5kg (female) |

If the patient is already on an intermittent dosing regimen of vancomycin and has received a dose in the last 12 hours, it is not necessary to give the loading dose before the infusion is started. Advice should be sought from the Critical Care Consultant in charge or the Consultant Microbiologist on call in complicated situations.

Maintenance Dose
The maintenance dose should be started immediately after administration of the loading dose has been completed, and must be administered via an infusion pump.

The maintenance dose is dependant on the patient’s renal function. The initial dose should be prescribed as shown in table 2 below and diluted to a final volume of 240ml in 0.9% sodium chloride for infusion over 24 hours (10mls/hour).

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Reviewed: April 2014
Next review: April 2016
Table 2

The daily dose should be adjusted according to serum levels as shown in table 3 below.

<table>
<thead>
<tr>
<th>Vancomycin level (mg/L)</th>
<th>Adjustment to daily dose</th>
<th>Infusion rate adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15</td>
<td>Increase by 500mg</td>
<td>Increase to next level up in table</td>
</tr>
<tr>
<td>15-24.9</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>25-29.9</td>
<td>Decrease by 500mg*</td>
<td>Reduce to next level down in table</td>
</tr>
<tr>
<td>&gt;30</td>
<td>Stop infusion for at least 6 hours. Do not restart infusion without the advice of the Consultant Microbiologist or pharmacist</td>
<td>According to review</td>
</tr>
</tbody>
</table>

*If current dose is 500 mg/day, the dose should be decreased to 250 mg/day

Table 3

Administration
At the concentrations described in these guidelines, vancomycin must be administered via a central venous access device. If central venous access is problematic, it may be possible to administer vancomycin peripherally but this is not included within these guidelines since a lower concentration will be required. In these circumstances, please seek advice from the pharmacist.

Monitoring
A serum level must be taken at 06.00 (with the routine blood tests) every day to enable determination of daily dose. Aim for a serum level of 15-25mg/L. If the level is outside this range, change the infusion rate to give the desired dose (mg/hr) until the infusion is complete (table 2). When making up the next infusion add the appropriate dose for the whole 24 hours.

Changing back to Intravenous Boluses
On leaving ICU/HDU the prescription needs to be changed back to IV boluses by giving half the total daily dose 12-hourly. In patients aged over 65 years the daily dose needs to be given once a day. Advice should be taken from a Consultant Microbiologist if necessary.

References