

## Vancomycin AUC/MIC Therapeutic Drug Monitoring

### Definitions:

- AUC<sub>24</sub>: 24-hour area under the plasma drug concentration versus time curve
- MIC: Minimum inhibitory concentration
- AUC/MIC: Ratio of AUC<sub>24</sub> to MIC
- PCA: Postconceptional age (gestational age + postnatal age)
- PNA: Postnatal age
- Steady state: Dynamic equilibrium in which drug levels are constant
  - Steady state is usually reached after the 3<sup>rd</sup> or 4<sup>th</sup> dose

### Exclusion Criteria:

- Consult clinical pharmacist if:
  - MRSA vancomycin MIC > 1 mg/L
  - Blood levels are not drawn at steady state
  - Unstable or changing renal function
- Levels are not required if:
  - Vancomycin is being used as empiric treatment or for surgical prophylaxis and expected duration of treatment is < 48-72 hours

### Recommended Initial Dosing:

#### 1) Neonates:

Age	mg/kg/dose IV	Interval
PCA < 27 weeks	15	Q24H
PCA 27-30 weeks	15	Q18H
PCA 31-36 weeks	15	Q12H
PCA ≥ 37 weeks		
PNA 0-7 days	15	Q12H
PNA 8-28 days	15	Q8H

#### 2) Children: 15 mg/kg/dose IV Q6H

- Can consider 20 mg/kg/dose IV Q6H if seriously ill and normal renal function

#### 3) Adults: 15-20 mg/kg/dose IV Q8-12H

- Can consider a loading dose of 25-30 mg/kg/dose IV if seriously ill

### **Timing of Blood Samples**

- Two blood samples at steady state are required to calculate AUC and they can be taken in one of two ways:

<u>Pre- and Post-dose Levels – 3<sup>rd</sup> or 4<sup>th</sup> dose</u>	<u>Two Post-dose Levels – 3<sup>rd</sup> or 4<sup>th</sup> dose</u>
<ul style="list-style-type: none"><li>• Pre-level: Within 30 minutes before the dose is given</li><li>• Post-level: 1-2 hours after the end of the infusion</li></ul>	<ul style="list-style-type: none"><li>• Post-level (C<sub>1</sub>): 1-2 hours after the end of the infusion</li><li>• Pre-level (C<sub>2</sub>): Within 30 minutes before the next dose is given</li></ul>

### **Target AUC/MIC:**

- Target a calculated AUC/MIC of 400-600
  - Assume MIC is 1 mg/L
  - Consult pharmacist for calculation of AUC/MIC and dose recommendations

### **Monitoring**

- After dose adjustment: Repeat pre- and post-levels once new steady state is reached
- Once AUC/MIC is within target range:
  - Repeat levels once weekly in stable patients
  - Repeat levels more frequently for patients who are unstable (eg. changing renal function, infection not improving)
- Serum creatinine and urea once weekly, or more frequently if renal function is changing
- Urine output daily