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Evaluation of Vancomycin Dosing and Corresponding Drug Concentrations in Pediatric Patients

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Purpose

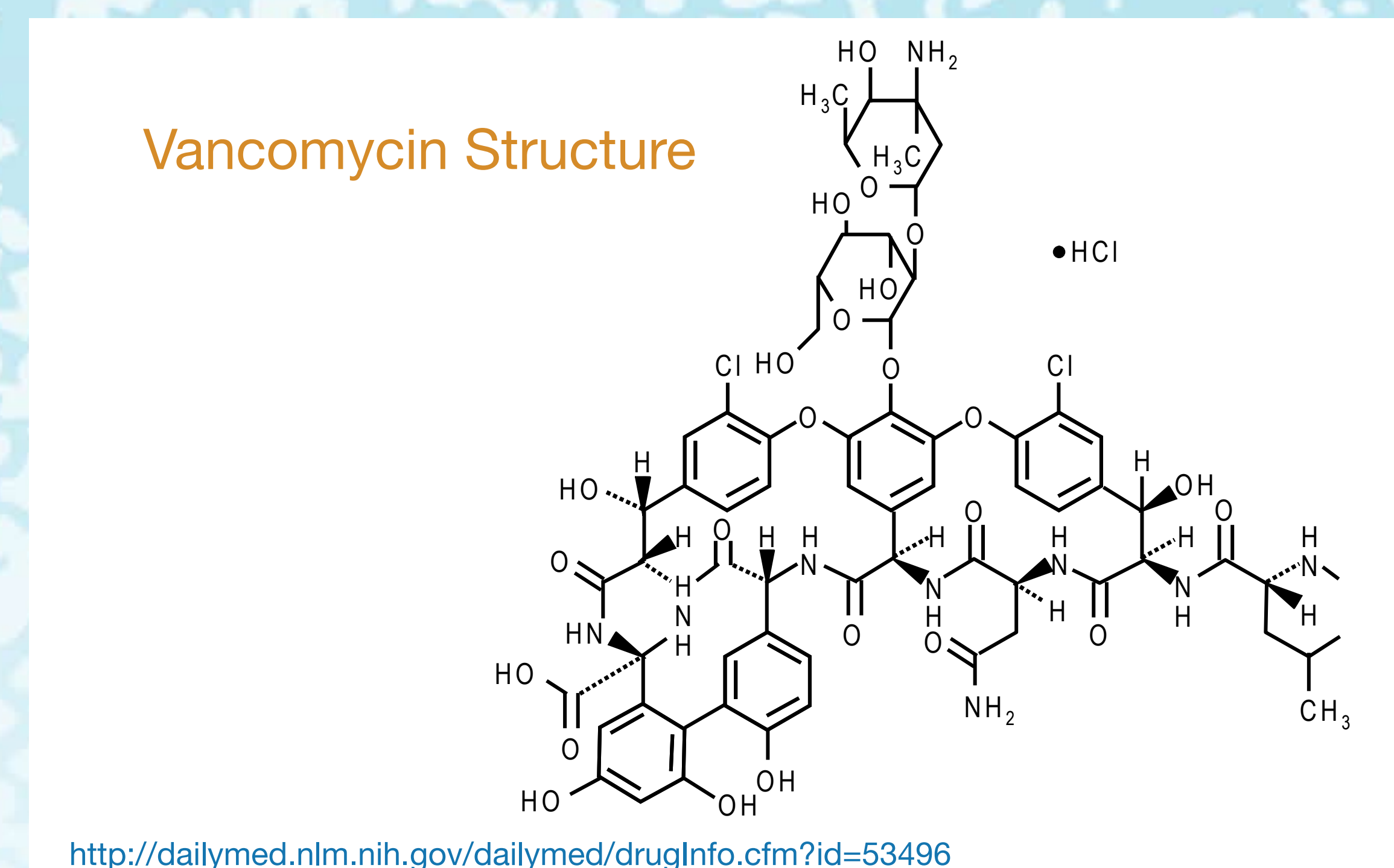
The objective of this study is to describe the relationships between dosing strategy, age and vancomycin trough levels in pediatric patients.

Background

- Vancomycin is the antibiotic of choice for invasive infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA).¹
- The preferred method of vancomycin monitoring is the measurement of serum trough concentrations.²
- The recommended trough concentration for adults is 10-20 mcg/ml and 15-20 mcg/ml for more serious infections.^{2,3}
- In the pediatric population, the optimal vancomycin dose and target trough is unknown.
 - Children have increased clearance compared to adults and require higher doses per body weight to achieve a trough of 10-20 mcg/ml.⁴
 - Vancomycin troughs less than 10 mcg/ml have been associated with treatment failure and the development of resistance.²
- Vancomycin-induced nephrotoxicity, a rare but serious side effect, occurs in about 5-7% of patients. This toxicity is more common in patients on high doses or concomitant nephrotoxic drugs.^{3,5}
- There are limited published reports regarding optimal vancomycin dosing in pediatric patients.

Study Design

A retrospective chart review of pediatric patients treated with intravenous vancomycin with at least one serum trough level reported.



Study Population

• Inclusion Criteria:

- Age \leq 17 years
- Age \geq 60 days
- Treatment with IV vancomycin, with at least one trough concentration reported
- Inpatient treatment from July 1, 2007 to June 30, 2011 at Lehigh Valley Health Network

• Exclusion Criteria:

- Inpatient treatment prior to July 1, 2007 or after June 30, 2011 at Lehigh Valley Health Network
- Age > 17 years
- Age < 60 days
- Patients with rapidly changing renal function at initiation of treatment
- Patients on hemodialysis prior to initiation of therapy
- Infants (post-natal age < 23 months) born at < 37 weeks gestation

Methods

- The goal of this retrospective review is to gather information regarding vancomycin dosing and resultant serum trough concentrations in pediatric patients.
- We will evaluate the effect of vancomycin dosing strategies on serum trough concentrations by separating patients into specific treatment groups based on total daily dose per body weight and evaluating the number of patients in each group achieving a target trough of 10-20 mcg/ml.

- We will evaluate the effect of age on serum trough concentrations by separating pediatric patients into specific age groups and evaluating the number of patients achieving a target trough of 10-20 mcg/ml in each group and the average dose necessary to achieve that target.
- A secondary evaluation will identify patients with deteriorating renal function and evaluate for the presence of risk factors for nephrotoxicity.

Disclosure

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

- Lauren Maurer: Nothing to disclose
- Jenny Boucher: Nothing to disclose

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