



# Evaluation of Vancomycin Dosing in Infants Less than 1200 Grams and Greater than 30 Days Postnatal Age

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## BACKGROUND

- Nosocomial Infections in Neonatal Intensive Care Units (NICU)<sup>1-2</sup>
  - 11% of NICU infants develop nosocomial infections
  - Risk factors: lower gestational age, lower birth weight, longer hospitalization
  - Common gram positive pathogens: coagulase negative *staphylococcus*, *staphylococcus aureus*, *enterococcus sp.*
  - Vancomycin often used for empiric treatment
- Vancomycin Dosing in Neonates<sup>3-7</sup>
  - ACH-Park Ridge vancomycin dosing guideline In the current dosing guideline, the vancomycin interval does not change with age. (Table 1).
  - Premature infants have decreased renal function at birth. Renal function begins improving in the first month of life.
  - In the current dosing guideline, the vancomycin interval does not change with age. The guideline does not account for post natal renal maturation.
  - Literature evaluating vancomycin dosing in infants is limited. Many studies utilize lower target trough levels than 10 - 20 mg/dl.

**Table 1: ACH Vancomycin Dosing Guideline**  
(adapted from the Pediatric and Neonatal Dosage Handbook)

Weight (g)	PNA <7 days	PNA > 7 days
<1200	15 mg/kg every 24 hours	15 mg/kg every 24 hours
1200-2000	15 mg/kg every 12-18 hours	15 mg/kg every 8-12 hours
>2000	15 mg/kg every 12 hours	15 mg/kg every 8 hours

## RESULTS

- 316 infants were identified through a query of medical records between 9/2007-12/2012
- 35 infants included
  - 16 (47.5%) female
  - 19 (54.3%) male
- 44 vancomycin trough levels (2 levels in 9 infants)

**Table 2: Baseline Characteristics of Encounters**

	Mean	Std. Deviation
Gestational Age (wk)	25.4	1.15
Birth Wt. (g)	653.64	139.56
Postnatal Age	36.8 days	6.639
Postconceptional Age	31.3 wks	2.48
Body Weight (g)	961.97	155.18
SCr (mg/dL)	0.54	0.223

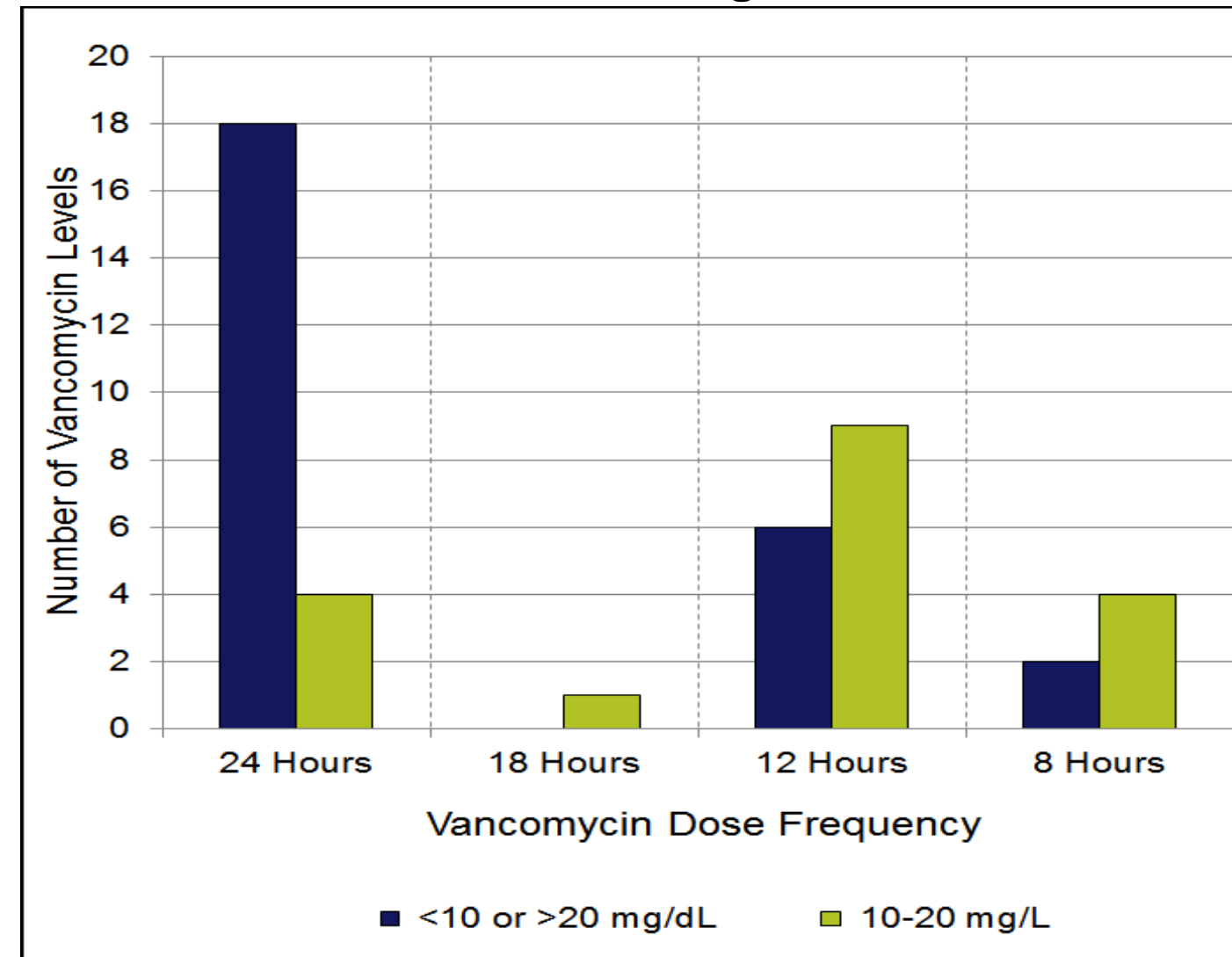
**Table 3: Number in Each Dosing Interval Group and Average Serum Creatinine**

Dosing Frequency	n (%)	Mean SCr mg/dL
Every 24 Hours	22 (62.9)	0.53
Every 18 Hours	1 (2.9)	0.7
Every 12 Hours	8 (22.9)	0.57
Every 8 Hours	4 (11.4)	0.45

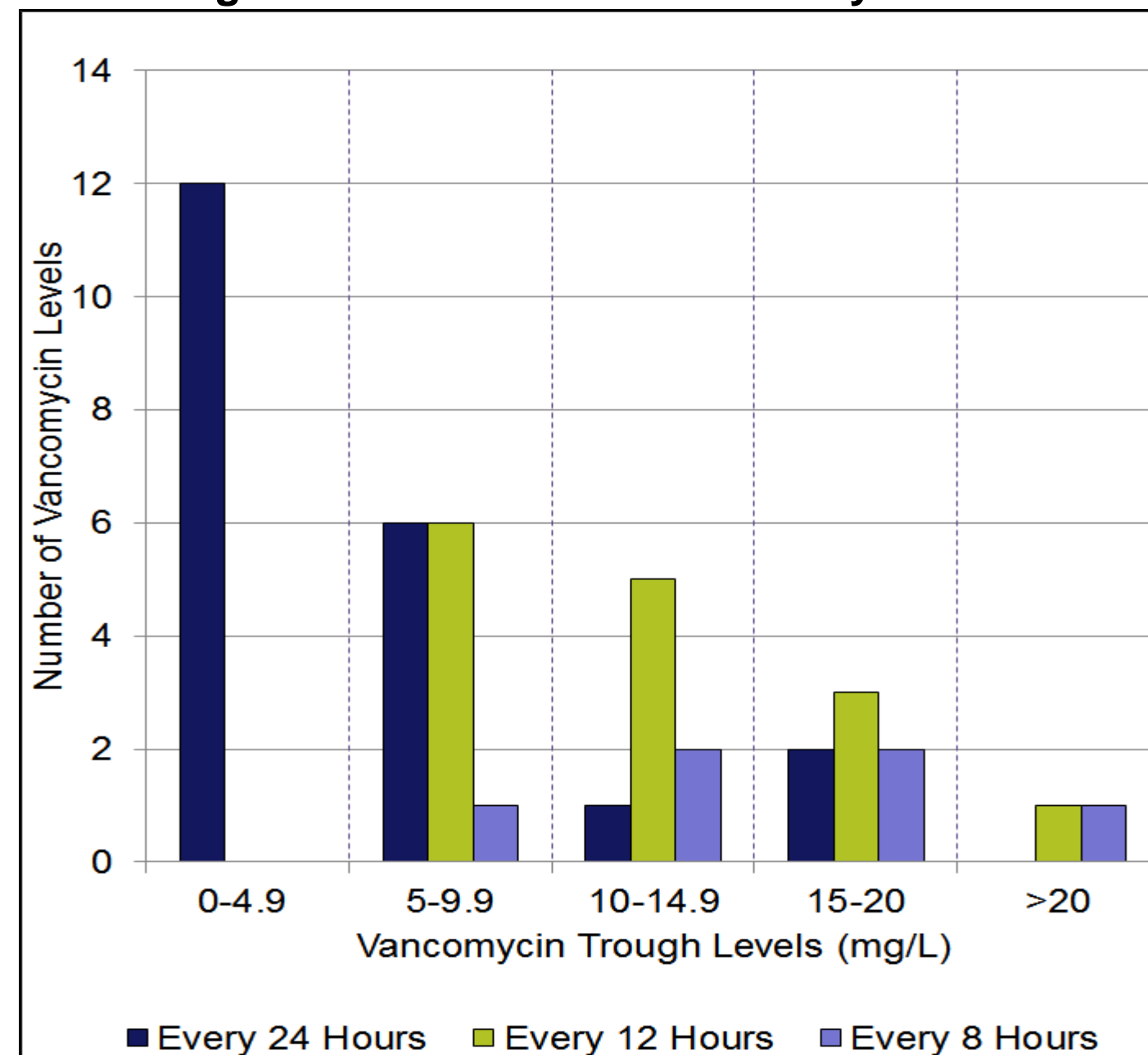
**Table 3: Average Serum Creatinine in Each Dosing Interval**

Dosing Frequency	Vancomycin levels 10-20 mg/L	p-value
Every 24 hours	4 (18.2%)	
Every 18, 12, 8 hours	13 (59.1%)	p = 0.002

**Figure 1: Vancomycin Levels in Target Range in Each Dosing Interval**



**Figure 2: Distribution of Vancomycin Levels**



## CONCLUSIONS

- In infants greater than 30 days old and less than 1200 grams, once daily dosing of vancomycin was not likely to achieve vancomycin levels in the target range.
- The majority (55%) of levels with once daily dosing were less than 5 mg/L
- Dosing frequencies of every 12 or 8 hours were more likely to achieve target vancomycin levels.
- More frequent dosing resulted in suprathreshold levels in only 2 patients levels majority of the time.
- Unable to make strong conclusions on the effect of covariates.
- Our findings are consistent with neonatal drug dosing references that adjust dosing frequency on the basis of gestational age and postnatal age<sup>4</sup>
- Updated vancomycin dosing guidelines at ACH-Park Ridge to reflect the findings of this study

**Table 4: Proposed Vancomycin Dosing Guideline**

Postconceptional Age (wks)	Postnatal age (days)	Frequency (hours)
≤29	0-14	24
	>14	12
30-44	0-7	12
	>7	8
>45	all	6

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