

UPDATED VANCOMYCIN GUIDELINES – GGC VIEW

AMT Network Event 16 Nov 2021





- ▶ 2009 Complex *S. aureus* infections recommended vancomycin trough concentrations 15-20 mg/L
- ▶ $AUC_{24}/MIC > 400$

IDSA GUIDELINES 2009

AM J HEALTH-SYST PHARM. 2009; 66:82-98

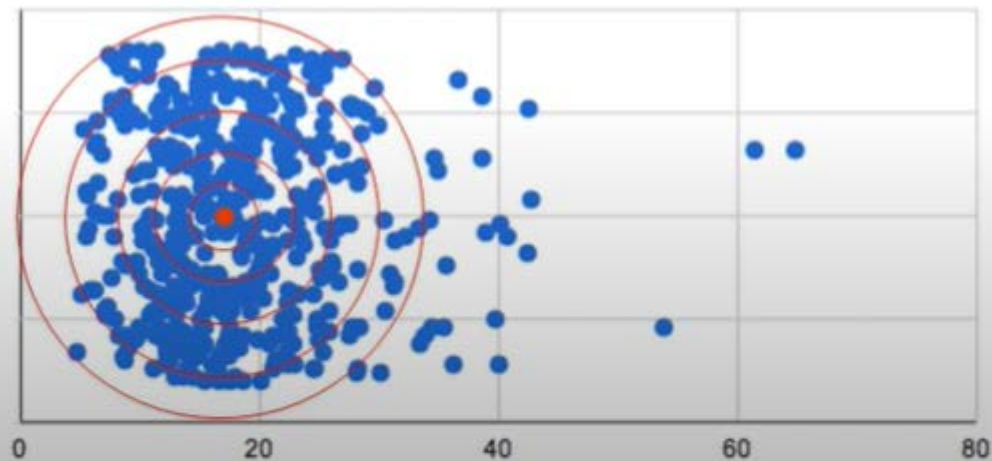
Webinar: Vancomycin Dosing: From Trough to AUC

Initial Vancomycin Trough Concentration Detroit Medical Center

Total (N)	Missing	Unique	Min	Max	Mean	StDev	Percentile						
							.05	.10	.25	.50 Median	.75	.90	.95
472	0 (0%)	227	4.70	64.80	18.25	7.96	7.60	9.30	13.00	17.10	22.30	27.50	33.35

Lowest values: 4.7, 5.1, 5.3, 5.5, 5.5

Highest values: 42.5, 42.7, 53.8, 61.4, 64.8



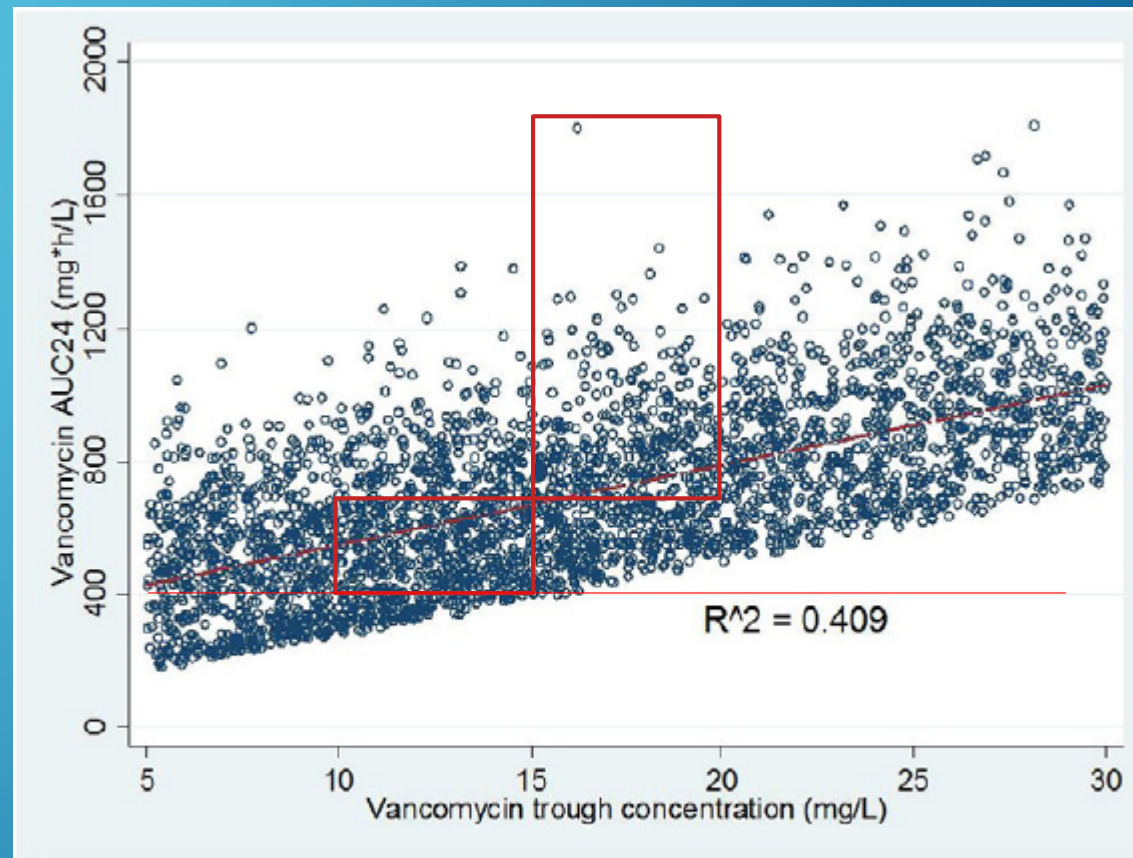
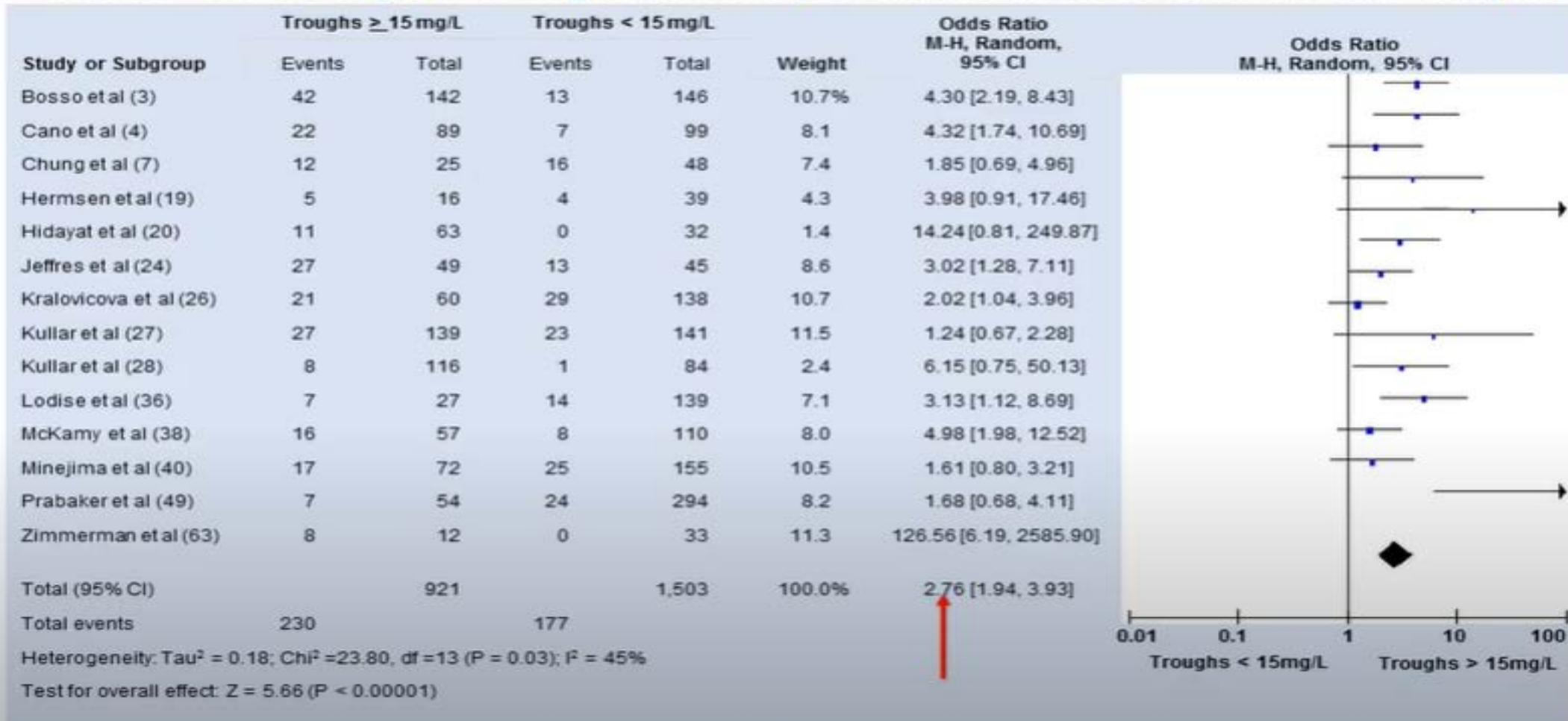


Fig. 2. Scatter and linear fit plot of vancomycin area under the curve over 24 h (AUC24) versus trough vancomycin concentration from 5000 subject Monte Carlo simulation.

Vancomycin-Induced Nephrotoxicity

In the "15-20 mg/L" Trough Era: A Systematic Review and Meta-Analysis



- ▶ Vancomycin dosing
- ▶ **Serious MRSA** infection an individualized target AUC_{24}/MIC ratio of 400 to 600 mg.h/ L (assuming a vancomycin MIC of 1 mg/L)
- ▶ Vancomycin AUC monitoring also recommended
 - ▶ all patients at high risk for nephrotoxicity (e.g., critically ill patients receiving concurrent nephrotoxins),
 - ▶ patients with unstable (i.e., deteriorating or significantly improving) renal function,
 - ▶ those receiving prolonged courses of therapy (>3 to 5 days).

IDSA GUIDELINES 2020

AM J HEALTH-SYST PHARM. 2020;77:835-864

- ▶ New GGC Vancomycin dose guidelines will result in **median**
 - ▶ Trough concentration 17 mg/L,
 - ▶ C_{av}^{ss} of 24 mg/L
 - ▶ AUC_{24} 576 mg.h/L.

NEW GGC VANCOMYCIN DOSE GUIDELINES

- ▶ Update (and validate) vancomycin dose calculator
 - ▶ Using adjusted body weight (or IBW) to calculate CrCl
- ▶ Need to update gentamicin Dose calculator
- ▶ Need to update CrCl dose calculator
- ▶ Education

NEW GGC VANCOMYCIN DOSING GUIDELINES

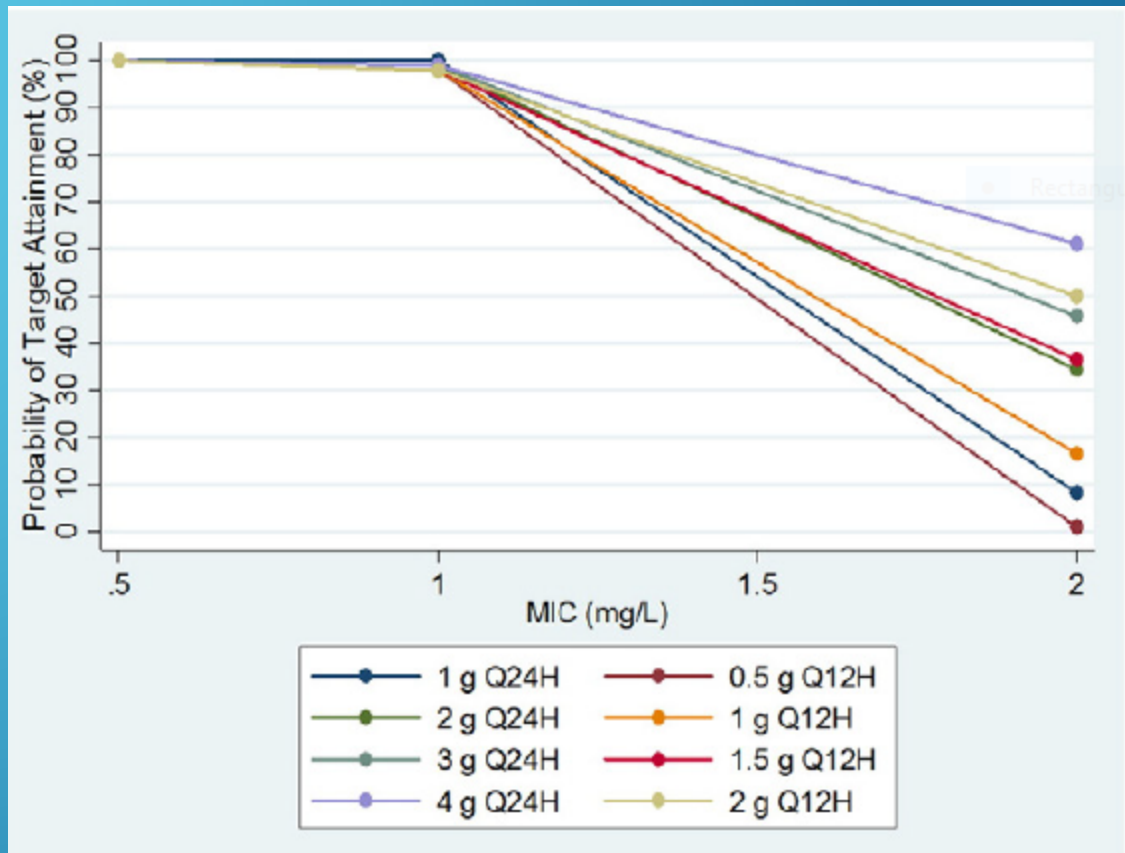


Fig. 1. Probability of achieving an AUC/MIC ratio ≥ 400 for vancomycin dosing regimens of varying intensity when trough vancomycin concentrations are between 15 and 20 mg/L.

- ▶ MIC values (from ECOSS) based on MSSA bacteraemias
- ▶ MIC < 0.5 mg/L 40%
 - ▶ AUC/MIC ratio highly likely to be > 400
 - ▶ AUC calculation **not** required
- ▶ MIC =1 mg/L 59%
- ▶ MIC > 1 mg/L 1%
 - ▶ AUC/MIC ratio unlikely to be > 400
 - ▶ Do **not** use vancomycin in these patients

VANCOMYCIN MICS

- ▶ **35-54** patients per day on vancomycin
 - ▶ **Impossible** to calculate AUC_{24} in every vancomycin patient
- ▶ Approx. **20** MRSA bacteraemia patients per year
- ▶ In 2019 427 SAB patients
 - ▶ Includes 20 MRSA
 - ▶ 10 % penicillin allergy – 40 patients
 - ▶ Based on MICs 60% of these = **24** patients
- ▶ “Do able” for AMPs to calculate AUC in 44 patients / year ???

VANCOMYCIN PATIENTS GGC

- ▶ Vancomycin AUC monitoring also recommended
 - ▶ all patients at high risk for nephrotoxicity (e.g., critically ill patients receiving concurrent nephrotoxins),
 - ▶ patients with unstable (i.e., deteriorating or significantly improving) renal function,
 - ▶ those receiving prolonged courses of therapy (>3 to 5 days).

CONTINUE AS WE ARE CURRENTLY
DOING

- ▶ **Insight Rx**

- ▶ ££££££££££

- ▶ **GGC OPT**

- ▶ Bayesian statistics

- ▶ Calculates of C_{ss} average (x24)

- ▶ **Elsewhere**

- ▶ Online dose calculators

- ▶ Use excel to work out AUC

HOW TO CALCULATE AUC₂₄ ?

- ▶ GGC Antimicrobial pharmacists will calculate AUC 24 in MRSA/MSSA bacteraemia patients with vancomycin MIC = 1mg/L

SUMMARY

- ▶ Alison Thomson, Christine Pender, Fiona Robb, Karen Downie, Kimberley Philip, Lee Stewart, Mairi MacLeod, Michael Da Silva Neto, Rachael Rodger, Susan Kafka

THANK YOU

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