



What To Do When the Vanc MIC is 2?

Vancomycin is a glycopeptide antibiotic that has broad spectrum activity against gram-positive bacteria, including methicillin-resistant *Staphylococcus aureus* (MRSA). It is recommended to employ therapeutic drug monitoring and target an area under the curve over 24 hours to minimum inhibitory concentration ratio (AUC/MIC) of 400-600 in suspected or definitive serious MRSA infections.¹ Additionally, it is recommended that the vancomycin MIC is assumed to be 1 mg/L although the [susceptible breakpoint](#) for vancomycin against *S. aureus* is ≤ 2 mg/L.² Doses needed to achieve an AUC/MIC of 400-600 when the MIC is 2 mg/L are likely unsafe.¹ What should you do when the vancomycin MIC is 2 mg/L?

Is it MRSA?

Due to a lack of data, the vancomycin dosing guidelines caution extrapolating AUC/MIC dosing to infections due to other gram-positive pathogens such as [Coagulase-negative Staphylococci \(CoNS\)](#) and [Enterococcus spp.](#)¹ Although this is probably safe³, and operationally easier for institutional protocols. Vancomycin susceptibility breakpoints for CoNS and *Enterococcus* spp. (≤ 4 mg/L) are higher than for *S. aureus* (≤ 2 mg/L).² Isolates with an MIC of > 1 mg/L are much more frequently seen among CoNS and *Enterococcus* spp. than *S. aureus*.⁴ Therefore, concerns regarding a vancomycin MIC of 2 mg/L in MRSA cannot be extrapolated to other gram-positive organisms.

How was the MIC determined?

For AUC/MIC dosing, it is recommended that the MIC be determined by broth microdilution (BMD)¹. Vancomycin MICs for MRSA are most often obtained via automated susceptibility platforms including MicroScan WalkAway, Vitek 2, and BD Phoenix, which may produce varied results compared to standard BMD methods. In one study comparing automated platforms with standard BMD, MicroScan overcalled a vancomycin MIC of 2 mg/L in 74.1% of isolates determined to have an MIC of 1 mg/L by BMD, whereas BD Phoenix and Vitek 2 undercalled an MIC of 0.5 – 1 mg/L in 76% and 20% of isolates, respectively, determined to have an MIC of 2 mg/L by BMD.⁵

What do guidelines recommend?

The 2011 IDSA MRSA guidelines recommend that the patient's clinical response be used to determine the continued use of vancomycin, independent of MIC when the vancomycin MIC is in the susceptible range (≤ 2 mg/L).⁶ For example, if a patient has clinically and microbiologically improved (e.g. defervesced, improved in leukocytosis, repeat blood cultures are negative), vancomycin should be continued. Alternative antibiotics are [not routinely recommended](#) regardless of MIC unless the patient has failed clinically or microbiologically **despite source control and thorough evaluation of additional foci of infection**. The 2020 vancomycin dosing guidelines, similarly, recommend that alternatives to vancomycin be guided by clinical judgement when the MIC > 1 mg/L and highlight that limitations in MIC determination by automated susceptibility platforms be considered.¹

Key Takeaway: Safety and efficacy concerns with a vancomycin MIC of 2 mg/L should not be extrapolated to all gram-positive organisms. MRSA vancomycin MIC of 2 mg/L is difficult to determine accurately in most microbiology laboratories, and its finding may represent normal technical variability. When an MIC of 2 mg/L is identified, treat the patient, not the number. Inquire with your microbiology laboratory regarding your susceptibility testing methods.

References:

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3. Heil EL, Claeys KC, Mynatt RP, et al. Making the change to area under the curve-based vancomycin dosing. *Am J Health Syst Pharm.* 2018; 75(24):1986-95. doi:10.2146/ajhp180034.
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