



## How vancomycin works

Inhibits cell wall synthesis in gram positive organisms by breaking the hydrogen bonds between the small chained peptides of peptidoglycan, preventing polymerization and stability of the cell wall.

Vancomycin is relatively narrow spectrum when considering the depth of coverage outside of medical gram positives.

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## Vancomycin: Advantages

Resistance to vancomycin is surprisingly rare (except for Enterococci)

Has excellent MRSA coverage when *dosed correctly*

Narrow spectrum (almost entirely Gram positives), less likely to promote pan-resistance

Almost always in-stock at hospital due to demand

Oral vancomycin is *not absorbed in the GI tract* which means it is ideal for C. diff

Flagyl has essentially been replaced by vancomycin for C. diff treatment due to lower tox

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## Vancomycin: Disadvantages

Vancomycin is not absorbed in the GI tract - only IV works for bacteremia or wounds. Oral vancomycin can be expensive if not compounded from IV formula by the pharmacy.

Dosing vancomycin is problematic especially if the pharmacy does not have its own dosing and monitoring protocol.

VRE is becoming increasingly common

It works slowly compared to beta lactams when treating MSSA

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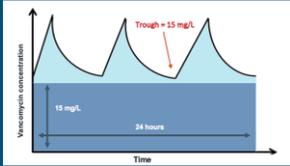
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## Vancomycin is annoying to monitor

A trough is supposed to be taken just BEFORE the next dose, representing the LOWEST concentration of antibiotic in your blood during a regimen.



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## Vancomycin and Piperacillin-Tazobactam

Covers everything, but promotes antibiotic resistance

Together, they have synergistic nephrotoxic qualities (worse than either alone)

Neither can be converted to oral equivalents

Meropenem has lower nephrotoxicity than Pip-Taz when combined with vanc

Vanc isn't always the best starting antibiotic for Staph...

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## Toxic Shock Syndrome

Typically caused by a toxin produced by *S. aureus* (TSST)

- Deviously works by being a "superantigen" that stimulates an uncontrolled cascade of interleukins, resulting in rapid sepsis and other problems (not the focus of this lecture)
- Classically, clindamycin is the first choice in this situation because it works by inhibiting the ribosomal production of toxin, at least for a few days.
- Vancomycin is slow despite being bacteriocidal (this myth is worth a whole different lecture)

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## Red Man Syndrome

NOT AN ALLERGY and should NOT be listed as one if it happens!

Caused by mast cell degranulation, similar to urticaria/hives, but is NOT ANAPHYLAXIS.

Diphenhydramine before vanc can often prevent this.



[https://www.medicinenet.com/what\\_type\\_of\\_a\\_reaction\\_is\\_red\\_man\\_syndrome/article.htm](https://www.medicinenet.com/what_type_of_a_reaction_is_red_man_syndrome/article.htm)

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## TLDR; Get to the point!

Vancomycin is probably overused when someone comes in with cellulitis

Vancomycin is nevertheless great because it has minimal resistance and narrow spectrum

Vancomycin works slowly compared to beta lactams and linezolid

Use meropenem or another broad-spectrum cephalosporin / beta lactam or carbapenem if you plan on using vanc on a patient with renal issues

Backstreet Boys will always be better than N'Sync

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## Salubrious Sources for Scholastic Success

<https://www.idstewardship.com/curve-enthusiasm-auc-guided-vancomycin-dosing-monitoring/>

<https://www.uptodate.com/contents/vancomycin-parenteral-dosing-monitoring-and-adverse-effects-in-adults>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC270616/>

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