Vancomycin recently celebrated its 60th birthday after it was discovered in soil samples from Borneo by an organic chemist working for Eli Lilly. It was one of the first drugs to be “fast-tracked” by the FDA due to the growing menace of drug-resistant staphylococci. The generic name was derived from the word to “vanquish.”

Ironically, the menace of drug resistance has not been conquered, although vancomycin has remained remarkably useful in practice today. It remains the first-line therapy for suspected or known methicillin-resistant staph aureus (MRSA) infection. Although the indication for vancomycin has remained the same, the philosophy of how to dose and monitor it has changed over time.

One factor that hasn’t changed is the authority on vancomycin. If you look at the three references below, Robert C. Moellering Jr. MD was involved in the original development and ongoing use of vancomycin for its multi-decade run. Sadly, Dr. Moellering passed away last year, but his legacy as the foremost authority on vancomycin (and a leader in the local Infectious Disease community) will always be remembered.

Here are some important factors to consider when ordering, dosing & monitoring vancomycin here at Brigham & Woman’s Faulkner Hospital:

**Dosing:** The dosing philosophy changed with the publication of the Joint Society recommendations published in 2009, as well as the implementation of Epic at the BWFH. Weight based dosing (generally 15 mg/kg) is programmed into the ordering system, leading to calculations of multiple different dose sizes.

At BWFH, we have tried to standardize the dosing to use the standard 1 gram and 500 mg ADDvantage vials or 1250 mg and 1500 mg premixed vancomycin bags for all doses. These doses are readily available to administer to a patient once an order is placed.

For weight-based (15 mg/kg) doses that are calculated in-between standard doses, we recommend changing the interval, but maintaining total daily dose.
For example:

- 53 kg patient with normal renal function:
  Epic defaults to 750 mg q12h - Please order 500 mg q 8 hrs (same total daily dose)

- 125 kg patient with normal renal function:
  Epic defaults to 1875 mg q8h - Please order 1500 mg q 6 hrs

The mechanism of action of vancomycin maximizes time of concentration above the Minimum Inhibitory Concentration (MIC); therefore increasing the interval with the same total daily dose should not affect outcomes.

For older, smaller patients or those with renal dysfunction, the 15 mg/kg dose is recommended (although 1 gram is preferred at BWFH). When using calculated creatinine clearance, if CrCl is below 30 mL/minute and patient is felt to be adequately hydrated, every 12 hour dosing is recommended to start and adjust based on level.

For patients with deteriorating renal function or questionable intravascular volume every 24 hour dosing is recommended. After a couple of doses, a trough should be ordered, before the next morning dose, with instructions to hold dose for level greater than 20 mcg/mL.

It should be noted that doses should not be held while waiting for level/trough to come back except in the case of patients with known diminished renal function and specific order for hold instructions (as above).

**Monitoring:** The recommended trough level for vancomycin should be between 15-20 mcg/mL. This is based on expert consensus and not on any large studies which have shown increased efficacy or decreased toxicity.

Routine monitoring is not required for all patients. The only situations where vancomycin levels should be drawn are patients with documented infections requiring vancomycin (i.e. MRSA-confirmed bacteremia), larger patients requiring larger doses, and patients with ESRD or severely diminished or rapidly deteriorating renal function.

Standard recommendations suggest drawing trough levels “before fourth dose,” when the medication has reached steady state. If the fourth dose is scheduled in the middle of the night, several problematic factors (limited phlebotomy staffing, coordination of dose with lab draw, and waking the patient) can be alleviated by selecting a lab draw on the next day shift.

BWFH Infectious Disease does not recommend routine draw of vancomycin troughs in patients being treated for cellulitis unless for reason listed above (i.e. acute decline in renal function).

In patients who need longer (greater than 1 week) therapy, please check trough once weekly.

There is no reason to draw a peak vancomycin level.

**Miscellaneous:**
- For assistance with dosing or interpretation with serum levels, please contact the Pharmacist covering the floor (Vocera or dial 2199 and ask for 6S/N, 7S/N, or ICU Pharmacist) or on off-hour shifts, please call the Pharmacy at ext. 7046.
- The minimum course of therapy for bacteremia with MRSA is 4 weeks.
- If the culture for MRSA returns with a susceptibility MIC of 2 (susceptible), there is a strong possibility of treatment failure or long time to cure. Please consult or contact Infectious disease to assess patient for alternative treatment options.
- If a patient develops a rash, especially in the head, neck area, slow infusion down and administer diphenhydramine. Histamine release is a side effect of vancomycin and should not be a reason to list vancomycin as an allergy.
- **Note:** the CrCl calculation in EPIC may not always accurately represent the patient’s renal function. To utilize calculated creatinine clearance use actual body weight and actual serum creatinine.

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