Beth Israel Deaconess Hospital-Milton

Antibiotic Stewardship: Applying Vancomycin Kinetics

The Problem

Vancomycin has become one of the most commonly used antibiotics in US hospitals for the treatment of gram-positive infections, especially those involving Methicillin-resistant *Staphylococcus aureus* (MRSA). Necessary changes in Vancomycin dosing guidelines were fueled by the increase of Vancomycin resistant *Staphylococcus aureus* and Vancomycin resistant Enterococcus species (VRE). Patients were traditionally dosed with universal dosing of 1 g every 12 hours with no regard to patient weight or renal function.

In 2009 Vancomycin therapeutic monitoring guidelines were developed by the Infectious Diseases Society of America and the American Society of Health-System Pharmacists (ASHP).

In review of Vancomycin ordering, dosing and monitoring practices at BID-Milton, significant variation relative to these published guidelines was identified.

Aim/Goal

Provide optimal management of Vancomycin to inpatients relative to dose, frequency and monitoring as a means of optimizing therapeutic effect, mitigating potential harm from drug toxicity, reducing the number of vancomycin peak/trough levels drawn and decreasing drug resistance.

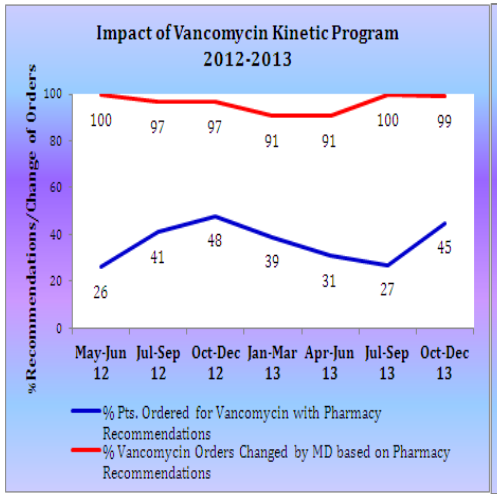
The Team

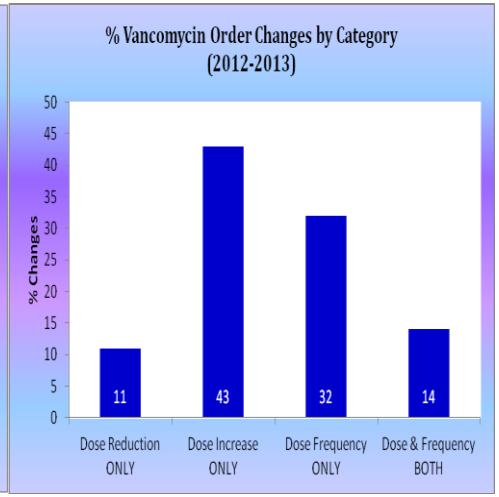
- Rachel Kleiman–Wexler: Pharm. D, Msc., R.Ph, Director, Pharmacy Services
- Jorge Barinaga: MD, Infectious Disease
- Maria Pia Sanchez: RN, MSc, MPH, Manager, Infection Prevention

The Interventions (Select Actions Taken)

- Program presented and approved by Medical Executive Committee (April 2012)
- Roll out of program began in May 2012: Pharmacy Director reviewed 100% of all Vancomycin orders, evaluated dosage, frequency, drug levels, monitoring parameters (including weight and creatinine clearance), and trough levels
- Pharmacy ordering of trough levels
- As necessary, recommendations made to ordering physician re. Dose/frequency changes, monitoring etc. Order revised based upon physician approval.
- 2012-2013, additional pharmacists trained on the process of Vancomycin order review and clinical decision support
- Outcomes shared quarterly at Pharmacy & Therapeutics, Clinical Oversight and Medical Executive Committees

The Results/Progress to Date





Lessons Learned

- Despite protocol-driven recommendations and physicians education, % of recommendations is unchanged since start of program, reflecting that clinicians have not adopted weight-based ordering of Vancomycin
- Positive response from Medical Staff. Majority of recommendations made by pharmacy (> 90%) are implemented
- Pharmacy recommendations that are not accepted by provider are reviewed for patient impact/potential harm by the Antibiotic Stewardship Team and communicated to the Department Chief as necessary for review and follow up

Next Steps/What Should Happen Next

- Identify feasibility of Vancomycin dosing etc under the full direction of pharmacy. Physicians would order first dose and then adjustments and monitoring would be performed by pharmacy. Changes/findings would be communicated to the attending physician.
- Currently working on a similar program model for aminoglycoside drugs

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For More Information Please Contact: *Alex Campbell, MSN, RN, NE-BC, CPHQ, Director HCQ & PS*
alex_campbell@miltonhospital.org