FOCUS-PDCA: Implementation of an electronic reminder to improve safety in patients receiving Vancomycin and Aminoglycosides

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Medication Safety Officer

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## The FOCUS-PDCA Cycle

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Find the process to improve

• Utilized the voluntarily electronic reporting system to identify the problem at our facility and interviews

  What was found?

• 1<sup>st</sup> Quarter of 2018: 75% of all reported vancomycin related events involved in failure to hold vancomycin even when the trough was elevated or administering before troughs were taken

• 2<sup>nd</sup> quarter of 2018: 100% of all reported vancomycin related events involved in failure to hold vancomycin even when the trough was elevated or administering before troughs were taken

• Direct interviews with decentralized clinical pharmacists: several instances where doses of vancomycin are given before troughs were taken. Doses were given when troughs were elevated, failing to notify pharmacists.
Organize an interdisciplinary team

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<th>THE TEAM</th>
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<td>IS/IT</td>
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<td>Front Line Nursing</td>
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<td>Clinical Pharmacists</td>
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<td>Clinical Nurse Specialists</td>
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<td>Medication Safety Officer</td>
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<td>Clinical Pharmacy Manager</td>
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Clarify the current (or baseline) problem

- The team used this opportunity to clarify the extent of the problem
- Discussed how success of the project would be measured

What did we do?

- Reviewed all the reported electronic incidents involving vancomycin
- Discussed the concerns from the pharmacy team regarding the issue
- Front line staff nurses expressed concerns about why the organization was seeing incident reports about this subject
Understand variation in the current process

1. **IV Vancomycin is an antibiotic commonly used to treat:**
   a. Infections due to *Pseudomonas*
   b. Infections due to *E. coli*
   c. Infections due to *MRSA*
   d. I have no idea

2. **Common toxicities associated with IV vancomycin include:**
   a. Nephrotoxicity
   b. Ototoxicity
   c. Redman Syndrome
   d. All of the above
   e. A and B only

3. **Typical infusion duration for 1000mg of IV vancomycin is:**
   a. 15 (0.25hr) minutes
   b. 30 (0.5hr) minutes
   c. 60 (1hr) minutes
   d. 90 (1.5hr) minutes
   e. 120 (2hr) minutes

4. **The target vancomycin serum trough concentration is:**
   a. 1 – 5 mg/l
   b. 5 – 10 mg/l
   c. 10 – 20 mg/l
   d. 20 – 30 mg/l
   e. 30 – 40 mg/l

5. **The most appropriate timing of the lab draw for a vancomycin trough is:**
   a. ~30 (0.5hr) minutes before the scheduled dose
   b. ~30 (0.5hr) minutes after the scheduled dose
   c. ~120 (2hr) minutes before the scheduled dose
   d. ~120 (2hr) minutes after the scheduled dose
   e. It doesn’t matter

Pre - Intervention

- ~33% responded correctly to all the questions
- ~67% responded incorrectly to at least one of the questions
Select the process for change

- Storage
- Transcribing / order entry
- Dispensing
- Administration
- Monitoring

**Errors**
- Wrong pocket
- Expired/damaged meds
- Unsecured med
- Wrong drug
- Wrong dose
- Wrong route
- Wrong patient
- Wrong form
- Wrong frequency
- Duplicate
- Allergy/interaction
- Wrong drug
- Wrong dose
- Wrong patient
- Wrong form
- Incorrect/wrong labelling
- Delay
- Wrong drug
- Wrong dose
- Wrong route
- Wrong patient
- Wrong form
- Wrong time
- Duplicate
- Delay
- Infusion pump related
- Allergy/interaction
- Wrong drug
- Wrong dose
- Wrong route
- Wrong patient
- Wrong form
- Allergy/interaction
- Failure to assess for effectiveness or lack thereof
- ADE/ADRs
- Side effects
Plan the change

• This point the team decided what plan of actions needed to occur

What did we do?

IT Responsibilities:

• We identified that nurses are task oriented people so…

• Changes were made in MediTech® (eMAR) system that was streamlined into the current workflow for both pharmacy and nursing

• IT developed an automated reflex intervention reminder task on nursing worklist for whenever vancomycin/aminoglycoside troughs are ordered
Plan the change

**Pharmacists Responsibilities:**

- Normally pharmacist will place orders for troughs
- During this process, after the pharmacist finishes placing an order for troughs, MediTech® will automatically reflex an order for the pharmacist.
  - This reflexed order subsequently generates a task for the nurse.
- The pharmacist will adjust the time for the reminder task to generate 60 minutes before the dose. Pharmacist will still order the trough 30 minutes before the dose.
- Screenshots next slides
Plan the change

- Order
  - VANCOMYCIN TROUGH
    - Routine
      - Provider
      - Source
  - Vanco Trough Reminder
    - Vanco Trough Hold Dose if > 20
    - VANCOMYCIN PEAK
    - VANCOMYCIN RANDOM
    - VANCOMYCIN TROUGH

- Reflex Orders
  - Q1HX1
    - Provider
    - Source

- Start/Stop
  - Thu Jun 07 18:00
  - Reflex
    - Thu Jun 07 18:00
    - Rusu, Florin
    - RN/ANC Protocol Orders
Plan the change

Nursing Responsibilities:

- RNs will ensure that the labs are drawn, resulted and administration parameters are met before administering vancomycin or aminoglycosides
- If the levels are supra-therapeutic, a call to pharmacy will be made.
Do (implement) the change

- We set a go-live date of July 17th, 2018
- We did education, using the SBAR method of communication to both pharmacy and nursing regarding the change
  - Education tailored per department since expectations and responsibilities are different
- Pharmacy students developed posters to educate nurses about vancomycin and the project
  - Poster was also sent electronically to entire nursing staff
- Medication management and safety committee has nursing rep from each unit. They were used to create awareness
Check the results of the change

- Methods used to check/measure success were:
  - Monitor electronic incident reporting system
  - IT reflex intervention report to determine compliance and appropriate use
  - Re-survey nurses to determine if there were improvements made in their knowledgebase regarding vancomycin use after mass education
Check the results of the change

<table>
<thead>
<tr>
<th>Verge Incident report</th>
<th>IT Report</th>
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<tbody>
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<td><strong>3Q18</strong></td>
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<tr>
<td>• 20% of reported vancomycin incidents related to failure to hold dose before trough had resulted</td>
<td>• IT report indicated that some pharmacist didn’t fully know how to use the reflex function</td>
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<tr>
<td><strong>4Q18</strong></td>
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<tr>
<td>• No vancomycin related events were related to failure to hold</td>
<td>• Some were scheduling it at the wrong time – which may have resulted in the incident report in 3Q18</td>
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<td>• Re-education of pharmacy staff who were involved took place</td>
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Check the results of the change

Post - Intervention

- ~83% responded correctly to all the questions
- ~16% responded incorrectly to at least one of the questions
Act to spread or sustain the change

• This step is where you identify lessons learned
• How to quality control the process
• Make adjustments to ensure sustainability

• OUR GOAL was to create a process whereby it will become part of the workflow for both pharmacy and nursing without relying on memory
• Based on feedback from both nurses and pharmacist, the process is effortless and it doesn’t add to their current workflow
• Incident report reflects that the process is working as I no longer see events where vancomycin doses are administered even when troughs are elevated
Questions?