Neostigmine Safety and Standardization
Sibley Memorial Hospital -- Johns Hopkins Medicine

Program/Project Description.
What was the problem to be solved?
Neostigmine is a high-risk medication; safe use demands intensive monitoring. Our institution consistently has safeguards in place for neostigmine's use in the post-operative period for neuromuscular blockage reversal; but this consistency did not translate to neostigmine use outside of this setting. Our problem: how do we make the use of neostigmine for colonic pseudo-obstruction as safe as its use in the operating room and the postanesthesia care unit?

How was the problem identified?
A member of Nurse Practice Council identified this problem.

What baseline data existed?
Prior to the creation of the standardized approach, there were twelve patients over the previous year who were administered neostigmine. Ten patients had received the agent in the operating room with postanesthesia care unit intensive monitoring, and two patients had received the agent while on a medical-surgical in-patient hospital unit.

What were the goals – how would you know if you were successful?
The primary goal was to create a standard process that maximized safety in a manner than complimented work-flow. Success of this project is measured indirectly by a lack of adverse event or incident reports.

Process.
After communication of the concern in Nurse Practice Council the department of pharmacy tackled the task—cooperating with gastroenterology experts and clinical nurse leaders—to create a standard and safe strategy for the use of neostigmine for colonic pseudo-obstruction.

Solution.
What solution was developed?
The collaborative process (nursing, pharmacy and medical staff) resulted in creation of a standardized order set that incorporates monitoring requirements, delineates both appropriate and non-appropriate patients, and outlines what to do in the event of patient decompensation. The neostigmine for colonic pseudo-obstruction standardized order set was endorsed by the institution's Pharmacy and Therapeutics Committee, reviewed and modified by the Health Information Management Committee and forwarded to the Medical Executive Committee for final approval.

How was this solution implemented?
The standardized order set is posted on the institution's intranet. A valid neostigmine order for colonic pseudo-obstruction requires use of the standardized form and all of the accompanying form's requirements.

Measurable Outcomes.
At the time of this submission there have not been any neostigmine adverse events or incident reports since implementation of the neostigmine order set in October 2009.

Sustainability.
A medication use evaluation (MUE) is on-going to assess outcomes and adherence to the policies/procedures outlined in the standardized order form.
Role of Collaboration and Leadership.
What role did teamwork and collaboration play in the solution?
Teamwork and collaboration were essential in creation and implementation of the solution – nursing, medical and pharmacy (both staff and department heads) all contributed. The solution would not have been realized without the input from all of the respective areas of expertise.

What partners and participants were involved?
The front lines of patient care and patient safety (the nursing staff) identified and highlighted a situation with potential for patient harm. Pharmacy drafted the initial protocol/order set. Through collaborative efforts with pharmacy, nursing, leadership and medical staff, four months and six revisions later, a functional process was in place.

Was the organization’s leadership engaged and did they share the vision for success?
Absolutely! Nursing, pharmacy and medical leadership all recognized the potential risk, and supported a process change that resulted in improved patient care.

How was leadership support demonstrated?
Leadership support was demonstrated in multiple ways. One measurement of support is via actions by the institution’s Nurse Practice Council, the Pharmacy and Therapeutics Committee, and the Medical Executive Committee. Other support was demonstrated in more collegial ways as observed by the pharmacy department’s project spearhead (and author of this solution) via willingness and openness to participate of all approached parties—from the hands-on nurse, to the nurse manager who had to assure both appropriate staff coverage and monitoring, to the physicians that would order the medication, to the pharmacists that would evaluate and process the orders.

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**SIBLEY MEMORIAL HOSPITAL**
**NEOSTIGMINE COLONIC PSEUDO-OBSTRUCTION ORDERS**

**BLOCK PRINT ALL MEDICATION ORDERS**
Use ballpoint pen- press firmly.
Authorization is given to dispense a generically equivalent drug unless it is written that no other brand is acceptable.

<table>
<thead>
<tr>
<th>Order Noted RN</th>
<th>Date &amp; Time</th>
<th>WHEN ORDERING MEDICATIONS, SPECIFY: DOSE ROUTE FREQUENCY INDICATION</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>□ Transfer to ________ (ICU unit or telemetry)</td>
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<tr>
<td>OR</td>
<td></td>
<td>□ Portable cardiac monitoring with one-to-one nursing for ________ hours</td>
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Neostigmine will only be dispensed if ALL of the following criteria are met (check all that apply)

- □ Patient has not had a myocardial infarction within the past 3 months
- □ Patient does not have acidosis
- □ Patient does not have a GI Perforation
- □ Patient is not receiving concurrent beta-blocker therapy
- □ Patient’s systolic blood pressure is 90 mmHg or greater
- □ Patient’s heart rate is 60 beats/min or greater
- □ Patient has not experienced recent bronchospasm requiring medical treatment
- □ Patient is 50 kg or greater
- □ General surgeon has been consulted prior to use

**NURSING:**
1. Heart rate and blood pressure Q 5 min for the first 30 minutes then Q 30 minutes x ________, Q 1 hour x ________, then at least every shift x 24 hours
2. Bed rest for four hours after administration of neostigmine

**DIAGNOSTIC STUDIES:**
Lab: BMP, calcium, magnesium, phosphorus and albumin within 24 hours prior to neostigmine administration (if not already done) AND in the AM
Radiology: Flat and upright abdominal x-ray in the AM

**MEDICATIONS:**
- Neostigmine 2 mg slow IV push over 10 min X1
- □ For Heart Rate less than ________ beats/min with symptoms (Change in Mental Status, Chest Pain, Shortness of Breath) administer Atropine 1 mg IV and call Rapid Response

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RN signature: __________________________
Date: __________________________
Time: __________________________
SA Signature: __________________________
Date: __________________________
Time: __________________________
MD Signature / ID Number / Date/Time: __________________________