Prevention of Venous Thromboembolism in an Urban Academic Medical Center

Gretchen Pacholek MSN, BSN, RN
Director of Surgical Service Line

Colleen Jensen MHSA/MPH, BSN, RN
Quality Intelligence Specialist
• 568-bed academic medical center
• Located in Hyde Park neighborhood on Chicago’s south side
• 25,000 patients admitted per year
• 78,000 visits per year to adult and pediatric emergency departments.

• Center for Care and Discovery opened in 2013, a state-of-the-art hospital with focus on cancer, digestive diseases, neuroscience and advanced surgery.
• Other notable specialty programs include endocrinology, cardiology, kidney diseases, orthopedics, transplantation, pediatrics and women’s services.
Why?

- Hospitalization is major risk factor for developing Venous Thromboembolism (VTE)
- VTE is the most common preventable cause of hospital death.
- Approximately 348,558 hospitalized patients in the United States are diagnosed with Deep Vein Thrombosis (DVT) each year.
- 277,549 are diagnosed with Pulmonary Embolism (PE)
- 78,511 are diagnosed with both DVT and PE.
- 13,164 of patients with DVT, 19,297 with PE, and 3,735 with both DVT and PE diagnoses will die.
- One-half of patients diagnosed with DVT will have long term complications such as swelling or pain in affected limb
- One-third of patients with DVT will have another DVT or PE within 10 years
Why?
Why?
Background

- Prophylaxis rates well below national average and an increase in VTE events in our hospital indicated a need for improvement in prevention practices.
- In 2013, approximately 73% of inpatients in our hospital received VTE prophylaxis.
- 15% of patients who developed a VTE during the hospitalization had not received prophylaxis.
- Organization VTE prevention interventions had been focused on surgical services.
- Patients across all services were developing DVTs or PEs while hospitalized.
- Focus on fall prevention had unintentional consequence of discouraging nurses from ambulating patients when appropriate.
**Aims**

- Address inconsistent practice around venous thromboembolism prevention for medical and surgical inpatients within the medical center.

- Lean methodologies were used to increase appropriate utilization of prophylaxis, decrease variability of practice, and reduce venous thromboembolism events.
Lean Kaizen

改善

Kai = Change  Zen = Good
Kaizen Event – Getting to the root cause

WE'RE HIRING A DIRECTOR OF CHANGE MANAGEMENT TO HELP EMPLOYEES EMBRACE STRATEGIC CHANGES.

OR WE COULD COME UP WITH STRATEGIES THAT MAKE SENSE. THEN EMPLOYEES WOULD EMBRACE CHANGE.

THAT SOUNDS HARDER.
Kaizen Event – Multidisciplinary Team

- Nursing-Leadership
- Medical and Surgical Registered Nurses
- Nursing Assistants
- Healthcare providers- MD and APN
- Nursing educators
- Support services- Transportation, Supply Chain
- Nursing informatics, Quality, Risk Management and Operational Excellence
Kaizen Event – 3 day “JDI” Activities

- No standard prevention practices for VTE
- Current state of VTE prevention
- Future state of VTE prevention
- Brainstorm of barriers to VTE prevention
- Developed standard roles for nurses, nursing assistants, and providers
- Developed action plan for rolling out interventions
- Transportation inventory of pumps
- Changed nursing documentation workflow to main assessment flowsheet
Swim Lane Map
**Standard Work**

<table>
<thead>
<tr>
<th>Work Step Description</th>
<th>Keypoint</th>
<th>Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report taken/ED 5BAR</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>2 Give NSA report</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Admit patient</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>1 Orders received/released</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2 Update NSA</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3 POC Initiated</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>4 Reinforce education about VTE interventions (pamphlet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administer Medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Check orders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Omnicon to retrieve medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Get supplies/syringe/alcohol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Educate/Administer/ Document Medications</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>5 If interruption in anticoagulant admin due to testing/procedures; give prior to departure (if in Omnicon timeframe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Ambulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Educate patient and document education</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2 Prepare patient</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>3 Walk</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Return to room</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Patient to bed/chair</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>2 Reconnect devices/drain</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>3 Give patient the call light</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4 Documentation VTE interventions every 4 hours and prn</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

**Cycle Time**: 99
Kaizen Event - Follow Up Activities

- VTE bundle inclusion in MD Order Sets - February 2014
- Quality audits led by nursing leadership - February 2014
- Education roll out - Interactive unit based in-services - February-April 2014
- VTE prophylaxis education added to orientation for Registered Nurses and Nursing Assistants - April 2014
- New ALPs machine at every bedside rolled out - April 2014
- VTE prophylaxis measures added to unit MDI boards - July 2014
- VTE prophylaxis education added to annual comps for RNs – August 2014
- VTE prophylaxis education added to annual comps for Nursing Assistants - October 2014
### Mechanical Prophylaxis

**MECHANICAL PROPHYLAXIS (or contraindication order) REQUIRED**

- [ ] Apply Alternating Leg Pressure Device  
  ROUTINE, UNTIL SPECIFIED, Starting 7/2/14 Until Specified
- [ ] Anti-Embolic Stockings: Knee High  
  ROUTINE, UNTIL SPECIFIED, Starting 7/2/14
- [ ] Anti-embolic Stockings: Thigh High  
  ROUTINE, UNTIL SPECIFIED, Starting 7/2/14
- [ ] Mechanical VTE Prophylaxis Not Indicated at This Time
- [ ] Patient at LOW RISK for VTE  
  UNTIL SPECIFIED, Starting 7/2/14 Until Specified
- [ ] Patient is on a Clinical Trial for VTE  
  UNTIL SPECIFIED, Starting 7/2/14 Until Specified

### Chemoprophylaxis

**CHEMOPROPHYLAXIS (or contraindication order) REQUIRED**

*If NOT ordering pharmacologic prophylaxis, please select a contraindication order.*

- [ ] heparin syringe  
  [5000 units every 8 hours]  
  Subcutaneous, EVERY 8 HOURS, Starting 7/2/14
- [ ] heparin injection  
  [weight > 100kg; 10000 units every 8 hours]  
  Subcutaneous, EVERY 8 HOURS, Starting 7/2/14
- [ ] enoxaparin (LOVENOX)  
  [GFR GREATER than 30 mL/min/1.73m² - dose 40mg daily]  
  Subcutaneous, EVERY 24 HOURS, Starting 7/2/14
- [ ] enoxaparin (LOVENOX)  
  [with GFR 15-30 mL/min/1.73m² - dose 30mg daily]  
  Subcutaneous, EVERY 24 HOURS, Starting 7/2/14
- [ ] VTE Chemoprophylaxis Not Indicated at This Time
- [ ] Patient at LOW RISK for VTE  
  UNTIL SPECIFIED, Starting 7/2/14

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Outcomes

Venous Thromboembolism Prophylaxis

Pre-Kaizen Event

Post-Kaizen Event

Prevention of Venous Thromboembolism
Outcomes

Incidence of Potentially-Preventable Venous Thromboembolism

Pre-Kaizen Event

Post-Kaizen Event
Outcomes

Perioperative PE/DVT

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate per 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 14</td>
<td>15.55</td>
</tr>
<tr>
<td>FY 15</td>
<td>11</td>
</tr>
</tbody>
</table>
## Outcomes

### Prevention of Venous Thromboembolism - PSI 12***

<table>
<thead>
<tr>
<th>What are we measuring?</th>
<th>How are we measuring it?</th>
<th>Desired Direction</th>
<th>Baseline and Rolling 12 Months</th>
<th>Our Performance</th>
<th>Current Status (FYTD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perioperative pulmonary embolism or deep vein thrombosis - PSI 12***</td>
<td>Count (Rate per 1,000 patients)</td>
<td></td>
<td></td>
<td>94</td>
<td>80</td>
</tr>
</tbody>
</table>

Our Performance:
- Baseline: 94
- Results Through: 7 (11.6)
- Current Month: 85
- FY15 Target: 80

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**Goal!**

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Next Steps

• Project Walk is being rolled out to identify patients with high risk mobility problems and promote early ambulation

• Monthly VTE event report distributed and reviewed by Nursing leadership for compliance with VTE prevention measures in patients who developed VTE

• Development of data metrics and reports that examine VTE prevention measures in greater depth
Lessons Learned

- Interdisciplinary team and key stakeholders at the table are crucial for success.
- “Kaizen” Lean methodology process improvement guided the development, implementation and integration of best practice initiatives.
- VTE prevention orders integrated into routine provider workflow improved ease of ordering and improved interdisciplinary communication of patient’s needs.
- Organizational support for dedicated resources, creating awareness and providing a standard process was essential.
- Culture change is always a challenge but was necessary to achieve success.