HIMSS Davies – VTE Ordering Optimization

02 October 2018

Brought to you by Mubadala
Case Study: VTE Ordering Optimization

Dr Iqbal Binoj, MD
Physician

Tori Mehmood
Clinical Data Abstractor

Vijai Kolar
Application Analyst, EMR IT

David Grannell
Clinical Informaticist, Informatics
Who We Are

- Set up the first US Multispecialty Hospital Outside North America
- Cultivating a Sustainable Healthcare System
- Supporting the Development of Emiratis in Healthcare
Our Mission and Vision Statements

**Mission**
The mission of Cleveland Clinic Abu Dhabi is to provide better care of the sick, investigation into their problems, and further education of those who serve.

**Vision**
Striving to be the world’s leader in patient experience, clinical outcomes, research and education in a fiscally responsible manner.
A Purpose-Built Medical Campus

- Diagnostic & Treatment
  - 16 Procedure Rooms
  - 17 Imaging Suites
  - 41 Room Emergency Department

- Swing Wing
  - Current: Office Space
  - Future: Supports Bed Expansion

- Ambulatory Clinic
  - 242 Exam Rooms

- Rosewood Hotel

- Rosewood Connection

- Critical Care 72 Beds

- Conference Center

- Acute Care 364 Beds

- Gallery Public Space

- 409,234 m² total gross area on a 23 acre site
- 364 beds scalable to 496 beds
- 26 Operating Rooms
- 1st LEED Gold certified hospital in the GCC
Complex & Critical Care

13 Institutes
5 Centers of Excellence
+30 Medical & Surgical Specialties
+60 Sub Specialties

Heart & Vascular Institute
Digestive Disease Institute
Respiratory & Critical Care Institute
Surgical Sub-specialties Institute
Anesthesiology Institute
Pathology & Laboratory Medicine Institute
Neurological Institute
Eye Institute
Medical Sub-specialties Institute
Emergency Medicine Institute
Imaging Institute
Quality & Patient Safety Institute
Our Caregiver Diversity

77 Nationalities Represented
35+ Languages Spoken
618 UAE Nationals (18% Emiratization)

3,459 + Clinical & Non Clinical Caregivers

373 Physicians
1,834 Nurses & Allied Health Professionals
1,252 Non Clinical Caregivers

618 UAE Nationals (18% Emiratization)
Our Unique Offerings

- Patient Experience
- Outcomes & Performance Metrics
- Innovative Model of Care
- State-of-the Art Technology
Patients First

- The Patients First philosophy is the core of CCAD
- Patient Experience levels continuously measured
- DOH ‘People’s Choice Award’ winner.
Clinical Firsts

UAE’s 1st Heart Transplant

UAE’s 1st Liver Transplant

UAE’s 1st Lung Transplant

UAE’s 1st Liver Transplant

UAE’s 1st Robotic Hysterectomy

1st Endoscopic Sleeve Gastroplasty

11 Kidney Transplants

UAE’s 1st Robotic Myomectomy

Cardioband Mitral Valve Repair
CCAD Accomplishments (1)

- DoH designated Teaching and Research Hospital
- Performing the UAE’s first and second double lung transplants, and third liver transplant
  - 11 total kidney transplants; 6 living related and 5 cadaveric
- Leading the way in the Department of Health (DoH) survey:
  - CCAD ranked first for overall patient satisfaction in the outpatient and ED
  - ED received the highest score in the most recent DoH audit and is the only ED in Abu Dhabi with 0 deficiencies
- Offering new services in Al Ain:
  - Al Ain achieved licensure to provide Neurology, Pulmonology, Urology and Sleep Medicine
- Distribution of the 2017 State of Clinic report
- Performing the 300th Bariatric operation
CCAD Accomplishments (2)

• Attaining Arab Board accreditation to begin physician residency programs:
  • Offering physician residency programs in Internal Medicine, General Surgery and Ophthalmology

• Regionally novel remote heart monitoring system installed in the Heart and Vascular Institute:
  • CCAD to become the first hospital in the region to adopt this technology
Local Problem

Problem Statement:

• Inadequate compliance with evidenced-based assessment, ordering and administration of VTE prophylaxis in eligible inpatients

Goals Set:

• Improve VTE Prophylaxis assessment, ordering and administration to internal target of ≥95% compliance
  • Create tool to facilitate VTE risk assessment
  • Update VTE orders to align with current evidence-based guidelines
  • Refine Best Practice Advisories (BPAs) to optimally support clinical decision making
  • Update nursing flowsheet to ensure discrete documentation of patient refusal
  • Create discrete documentation to flow into data abstractor reports.

• Decrease the post-operative PE/DVT outcomes based on Abu Dhabi Department of Health Quality requirements
VTE Guidelines

- The following evidence-based guidelines were used to optimize VTE ordering:

  Antithrombotic Guidelines
  9th Edition: AT9, 2012

  Preventing HA-VTE
  A guide to Effective Quality improvement

  NICE guideline [NG89], March 2018
Design and Implementation – Stakeholder Group

VTE Prophylaxis Optimization Team

- Physician
  - Staff Physician - Inpatient
- Clinical and Nursing
  - Staff Nurse
  - Nurse Educator
  - Inpatient Pharmacist
- Quality & Patient Safety
  - Institute Chair
  - Clinical Risk Manager
  - Clinical Data Abstractor
- Nursing Quality
  - Quality Manager
  - Nursing Analyst
- IT EMR
  - Clinical Documentation Analyst
  - Inpatient Orders Analyst
- Informatics
  - Inpatient Informaticist
  - Inpatient Trainer
Identification of IT Solution

Solutions Identified:

• Risk assessment tools added within the VTE OrderSet to facilitate VTE risk assessment
• VTE orders updated to align with current evidence-based guidelines
• VTE modules added to admission and transfer OrderSets
• VTE assessment and reassessment BPAs refined to optimally support clinical decision making
• Nursing vascular assessment flowsheet modified to include discrete documentation of patient refusal
• Abstractor reports mapped to include discrete documentation from orders, BPAs and nursing documentation flowsheets
Solution Design and Implementation - Timeline

- Nov 2016
- Feb 2017
- Apr 2017
- Nov 2017
- Jan 2018
- Apr 2018
- Aug 2018

**Design & Build**
- Clinical Documentation: Flowsheets updated for Core Measures Reporting Compliance
- Orders: VTE Prophylaxis OrderSet Mobilization section updated to default ‘Mobilize patient with early ambulation as tolerated

**Implement**
- Jan 18: Change re-assessment BPA trigger to 72 hrs from 168 hrs
- Apr 18: Implement cascading OrderSets
- Aug 18: Change admission BPAs to fire 24 hrs after admission from 12 hrs

**Optimize**

**Maintenance and Enhancements**
Solution Design – Workflow Enhancements

VTE Workflow in Epic

- ORs
- Clinics
- ED
- Home
- External Hospitals

Physician Epic

- Admission
  - Ordersets with VTE used
    - No
      - 48-Hr Post Admission
      - ICU Units
    - Yes
      - VTE-1 BPA Triggers
      - VTE-2 BPA Triggers
      - VTE Risk Assessment with Prophylaxis ORDERSET used to place required Orders
      - VTE Risk Assessment with Prophylaxis ORDERSET used to place required Orders
      - Re-Assessment BPA Triggers
      - Physician receives Notification

- Reviews VTE Prophylaxis orders and acknowledges

Nurse Epic

- Patient Refused?
  - Yes
    - Updates Flowsheet as Patient Refused
  - No
    - Administers Medication and/or applies mechanical
    - Updates Flowsheet

VTE Workflow
- Admission OrderSets
- VTE Risk Assessment OrderSet
- Best Practice Advisory
- Flowsheets
Solution Design – OrderSets for modification

<table>
<thead>
<tr>
<th>Section</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>813 ADULT TO LONG-TERM CARE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3040000025</td>
<td>MSI GENERAL ADULT ADMISSION AGU</td>
<td></td>
</tr>
<tr>
<td>3040000029</td>
<td>MSI UROD IP GENERAL POST-OP</td>
<td></td>
</tr>
<tr>
<td>3040000057</td>
<td>IN ICD II</td>
<td></td>
</tr>
<tr>
<td>3040000063</td>
<td>HI MDU MEASUREMENT CANAL POST-OP</td>
<td></td>
</tr>
<tr>
<td>3040000093</td>
<td>HI MDU MEASUREMENT CANAL POST-OP</td>
<td></td>
</tr>
<tr>
<td>3040000109</td>
<td>HI MDU MEASUREMENT CANAL POST-OP</td>
<td></td>
</tr>
<tr>
<td>3040000123</td>
<td>HI MDU MEASUREMENT CANAL POST-OP</td>
<td></td>
</tr>
</tbody>
</table>

**VTE Risk Assessment**

- OrderSet
- Flowsheets
- VTE Workflow

**Admission OrderSets**

**Best Practice Advisory**

**Admission**

**OrderSets**

**Flowsheets**

**VTE Risk Assessment OrderSet**

**Best Practice Advisory**

**Flowsheets**

Cleveland Clinic Abu Dhabi

Brought to you by MedMatics
Solution Design – VTE Risk Reassessment with Links to PADUA and CAPRINI
Solution Design – VTE Risk Reassessment with Links to PADUA and CAPRINI

Calculator: Padua score for assessing venous thromboembolism risk in hospitalized patients

- Cancer: Active or treated with chemotherapy and or XRT within the last six months (3 points)
- History of venous thrombotic disease (not to include superficial thrombosis) (3 points)
- Impaired mobility of at least three days duration (3 points)
- Preeclampsia (3 points)
- Trauma or surgery within one month (2 points)
- Age 70 years old (1 point)
- Heart or respiratory failure (1 point)
- Stroke or acute MI (1 point)
- Acute infectious disease or rheumatic disease (1 point)
- Obesity with a body mass index 30 kg/m² (1 point)
- Intercurrent hormone replacement treatment (1 point)

Total criteria point count: 5

Padua score interpretation:
- 0 to 3 points: Lower risk: 0.3% risk of symptomatic VTE
- 4 to 20 points: Higher risk: 11% risk of symptomatic VTE

Notes: The use of UpToDate is subject to the Subscription and License Agreement.
### Modified Caprini risk assessment model for VTE in general surgical patients

<table>
<thead>
<tr>
<th>Risk score</th>
<th>1 point</th>
<th>2 points</th>
<th>3 points</th>
<th>5 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 45 to 60 years</td>
<td>Age 61 to 74 years</td>
<td>Age ≥75 years</td>
<td>Stroke (&lt;1 month)</td>
<td></td>
</tr>
<tr>
<td>Minor surgery</td>
<td>Arthroscopic surgery</td>
<td>History of VTE</td>
<td>Elliptic arthroplasty</td>
<td></td>
</tr>
<tr>
<td>BMI &gt;25 kg/m²</td>
<td>Major open surgery (&gt;45 minutes)</td>
<td>Family history of VTE</td>
<td>Hip, pelvis, or leg fracture</td>
<td></td>
</tr>
<tr>
<td>Varicose veins</td>
<td>+</td>
<td>+</td>
<td>Acute spinal cord injury (&lt;1 month)</td>
<td></td>
</tr>
<tr>
<td>Malignancy</td>
<td>Prothrombin 20210A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confined to bed (&gt;72 hours)</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immobilizing plaster cast</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral contraceptives or hormone replacement</td>
<td>Central venous access</td>
<td>Elevated serum homocysteine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepsis (&lt;1 month)</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serious lung disease, including pneumonia (&lt;1 month)</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal pulmonary function</td>
<td>Other congenital or acquired thrombophilia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congestive heart failure (&lt;1 month)</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of inflammatory bowel disease</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical patient at bed rest</td>
<td>=</td>
<td>=</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interpretation**
Solution Design – VTE Risk Reassessment with Prophylaxis Cascading OrderSet

<table>
<thead>
<tr>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>- PADUA Medical Risk Assessment Calculator</td>
</tr>
<tr>
<td>- CAPPS Surgical Risk Assessment Calculator</td>
</tr>
<tr>
<td>VTE Risk Category - Medical Low Risk</td>
</tr>
<tr>
<td>VTE Risk Category - Medical At Risk</td>
</tr>
<tr>
<td>VTE Risk Category - Moderate Risk Surgery</td>
</tr>
<tr>
<td>VTE Risk Category - High Risk Surgery</td>
</tr>
</tbody>
</table>

**VTE Risk Category - High Risk Surgery**

Continuous starting Today at 19:22 until Specified, if applicable. Patients weighing greater than 100 pounds and known risks for VTE or any age patient with a history of prior VTE or any prior history of VTE, abdominal/pelvic surgery or cancer.

**Pharmacologic Prophylaxis**

- Pharmacological Prophylaxis Indicated
- Pharmacologic Prophylaxis Standard
- Pharmacologic Prophylaxis Standard Starting Tomorrow

**Special Circumstances - Prophylaxis**

- Enoxaparin (Clexane) 40mg SubQ Q12h – Iatrogenic/Trauma dosing only
  - 40mg, Subcutaneous, Every 12 hours

**Pharmacologic Prophylaxis Not Indicated Due To Therapeutic Anticoagulation**

**Pharmacologic Prophylaxis Contraindicated**

**VTE Mechanical Prophylaxis Medium to High Risk**

**VTE Mechanical Prophylaxis**

- Intermittent Pneumatic Compression (IPC) Device To Be Worn Continuously Except For Bathing And Skin Assessment Per Nursing Unit Protocol Or Periods Of Active Ambulation
  - Routine, Once
- Graduated Compression Stocking To Be Worn Continuously Except For Bathing And Skin Assessment Per Nursing Unit Protocol
Solution Design – VTE BPA requirements

VTE-1 will fire under the following criteria:

- Patient must be 18 years of age +
- Patient is on acute care floor – currently admitted
- Patient does NOT have a Dx of Ischemic stroke
- Patient does not have a contraindication indicated
- Patient does not have an active med prophylaxis order nor has patient received an administration of said order
- Patient does not have documentation in flowsheets of application of mechanical prophylaxis
- Patient does not have an active order for mechanical prophylaxis
- Patient has been admitted for at least 24 hours

VTE-1 does not fire in the ED.
Only fires for physicians and residents
Solution Design – VTE Reassessment BPA requirements

Reminder VTE will fire every 72 hours for the following criteria:

- Patient must be 18 years of age +
- Patient does not have documentation in flowsheets of application of mechanical prophylaxis
- Patient does not have an active med prophylaxis order
- Patient has either (COR35 older than 7 days OR COR52 older than 24 hours OR COR 49 older than 7 days OR COR45 older than 7 days)
- Patient does not have an active order for mechanical prophylaxis

VTE reminder does not fire in the ED.
Only fires for physicians and residents
Solution Design – Flowsheet Documentation
Solution Design – InBasket Message to Physicians
Value Derived – Increased VTE Compliance & Reduced post-op PE/DVT cases

VTE Core Measure Compliance

87% 86% 82% 81% 88% 88% 93% 91% 94% 90% 95% 93%

Mean Compliance 86%

Mean Compliance 93%

*25% Decrease in Post-Operative PE/DVT Occurrences Since Intervention
Value Derived

• Ordering efficiency improved for Physicians

• Reduced gaps in communication between Physicians, Nursing and Pharmacy in relation to VTE ordering

• Revised BPA algorithms have led to less intrusion on Physician daily workflow when it comes to Risk reassessments for longer length of stay patients, without compromising patient safety

• Nursing documentation workflow improved

• Anecdotal feedback of Physician satisfaction due to less ordering time/documentation
Action Plan for Continuous Improvement

- Optimizing Nursing documentation
- Expand PE/DVT outcomes measure reporting for all inpatients
- Broaden education to key stakeholders (Nursing, Physicians and Pharmacy)
- Develop education material for patients refusing Prophylaxis
- Continue analysis of care delivery
Summary Recap

**Problem Statement:** Inadequate compliance with evidenced-based assessment, ordering and administration of VTE prophylaxis in eligible inpatients

**Solution Design and Implementation:** VTE workflow was streamlined and automated for Admissions and Transfer, through VTE OrderSet modifications, BPAs and Flowsheet documentation

**Result:**
- Improved VTE Compliance and working towards consistently meeting the internal target of 95%
- Improved Clinician workflow for VTE Ordering and Documentation
- Contributed to reducing post-op PE/DVT occurrences
VTE Ordering Optimization
Case Speaker Profiles

Dr Iqbal Binoj, MD
Title: Physician
Role: Responsible for providing Acute Medical care for inpatients as a Hospital Medicine Physician while also being the Lead Physician Champion for VTE Prophylaxis measures, compliance and optimization efforts. He is an Epic super user for VTE Prophylaxis workflow solution adoption among the physician community

Tori Mehmood
Title: Clinical Data Abstractor
Role: Responsible for review of patient records and abstracting, aggregating, and analyzing process and outcomes measures for outside reporting agencies and internal stakeholders

Vijai Kolar
Title: Application Analyst, EMR IT
Role: Responsible for providing system build solutions (workflow analysis, build and test) and troubleshoot support related to the Epic modules ‘Inpatient Orders’ and ‘Inpatient ClinDoc’ in collaboration with multi-disciplinary teams