October 8-9, 2015
AAHP Fall Seminar

A SCORING SYSTEM IN THE EMR TO FACILITATE PHARMACIST MONITORING OF ANTICOAGULANTS
Disclosures

☐ I have no relevant financial relationships to disclose.
Baptist Health - Arkansas

- 8 Hospitals
  - Little Rock
  - North Little Rock
  - Arkadelphia
  - Heber Springs
  - Malvern
  - Stuttgart
  - Conway – #9 coming soon
Baptist Health - Arkansas

- 8 Hospitals
  - 1 Rehabilitation Institution
  - 1 Extended Care Facility
  - 1 Psychiatric Hospital
  - 2 Critical Access Hospitals
  - 5 Emergency Departments
Current Epic Applications

- Current version 2014 IU1 (since March 2015)
- ADT Prelude
- ASAP (Emergency Room)
- Cadence (Scheduling)
- Clinical Documentation
- HIM
- POE (Physician Order Entry)
- MyChart
- Resolute Hospital Billing
- Willow (Pharmacy)
Epic Applications in Build Phase

- OpTime/Anesthesia
- Radiant
- Stork
Baptist Health’s Launch Timeline

- **Clinical Launch North Campus**
  - Feb 2012: ASAP, Clindoc, POE, Willow, HIM

- **Clinical Launch Main Campus**
  - Nov 2012: ASAP, Clindoc, POE, Willow, HIM

- **Clinical Launch Rural Campus 1**
  - Jan 2013: ASAP, Clindoc, POE, Willow, ASAP, HIM

- **Clinical Launch Rural Campus 2**
  - Feb 2013: ASAP, Clindoc, POE, Willow, ASAP, HIM

- **Upgrade to 2012**

- **Clinical Launch Rural Campus 3**

- **Rev/Access Launch ALL Campuses**

- **Launch Rural Campus 4**
  - Apr 2013: ASAP, Clindoc, POE, Willow, ASAP, HIM, ADT, Cadence, Resolute

- **June 2013**

- **Clinical Launch Rural Campus 4**
  - Oct 2014: ASAP, Clindoc, POE, Willow, ASAP, HIM, ADT, Cadence, Resolute

- **Upgrade to 2014**

- **Mar 2015**
Objectives

- Recognize the need for anticoagulation monitoring to improve patient safety.
- Develop an appreciation of how pharmacist clinical monitoring has evolved.
- Explain how an anticoagulation scoring system can facilitate pharmacist clinical monitoring and documentation of interventions.
TJC Sentinel Event Database (1997 through 2007)

- Medication related – 9.3% of all events
- Anticoagulants – 7.2%
- While receiving anticoagulants, patients must be monitored closely to ensure effectiveness and to prevent side effects or overdosing

The Joint Commission Sentinel Event Alert Issue 41, Sept 24, 2008
Take extra care with patients who take medicines to thin their blood

Reduce the likelihood of patient harm associated with the use of anticoagulant therapy
National Action Plan for Adverse Drug Event Prevention

- ADEs account for one-third of hospital adverse events.
- Outlines opportunities to advance patient safety with regard to the prevention of adverse events among three primary drug classes.

Challenges to anticoagulant management in hospitalized patients

- Acuity and complexity of patients
- Dosing considerations (renal function, weight change)
- Change in diet
- Interruption of therapy
- IV to PO transitions
- Transitions of care

The National Quality Strategy

- Better Care: Improve the overall quality.
- Healthy People/Healthy Communities: Improve the health of the U.S. population.
- Affordable Care: Reduce the cost of quality health care.
Effective Communication and Coordination of Care

- Improve EHR tools to enable provider access to real-time, integrated, linked pharmacy-laboratory data to facilitate seamless access to pertinent medication and laboratory results, for example,
  - Support development of electronic flowsheets that display trends in daily labs, concomitant medications, reversal medications, etc., that are specific to and can support optimal anticoagulation management
  - Support development of clinical decision support tools specific to anticoagulation management

Opportunities for Advancing Anticoagulant ADE Prevention Strategies/Tools, as Identified by the National Quality Strategy Priorities—Inpatient Settings
Science-Driven Prevention and Treatment

- Promote a multidisciplinary, coordinated, and systematic approach to inpatient anticoagulation management; for example,

- Better address safe use of anticoagulants commonly utilized in inpatient settings (e.g., heparin) and NOACs in nationally recognized health care quality/patient safety measures and in nationally recognized clinical guidelines

Opportunities for Advancing Anticoagulant ADE Prevention Strategies/Tools, as Identified by the National Quality Strategy Priorities—Inpatient Settings
Clinical Monitoring and Documentation
Prior to Integrated EMR

- Paper Chart
- Mainframe System
- Printed reports
- Data mining software
- Clinical intervention documentation software
Historical methods

- Access to chart limited
- Information in reports not dynamic
- Working with multiple tools to review data
- Intervention documentation not integrated
Integrated EMR

- Access to chart from any workstation
- Reports in system lists are dynamic
- Monitoring and documentation done within same system
- Intervention documentation can be copied to notes
Anticoagulation Scoring System

- Rules
- Columns
- Reports
- Documentation
Rules

- Active order for anticoagulant medication excluding heparin flush. Scores 1 point for each anticoagulant.
Rules

- Active order for heparin infusion with a PTT less than 50 or greater than 100 in the last 24 hours. Scores 2 points
Active order for a non-warfarin anticoagulant with an INR greater than 2 in the last 2 days. Scores 2 points.
**Rules**

- Active order for anticoagulant (non-warfarin) and platelet count < 100,000 or 50% decrease in platelet count or no platelet count. Scores 2 points.

### Anticoagulant Non-Warfarin and PLT < 100,000 or 50% change or no PLT: 2 points (Up 2 points since last review) - [Last updated: 09/04/16 11:36]

Patient scored 2 points for being on anticoagulant non-warfarin and for having platelet count < 100,000 and/or 50% change, or none reported in last 3 days.

**RX ANTICOAGULANTS NON-WARFARIN**

<table>
<thead>
<tr>
<th>Start</th>
<th>Dose/Rate</th>
<th>Route</th>
<th>Frequency</th>
<th>Ordered</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/29/15 16:05</td>
<td>60 mg</td>
<td>Subcutaneous</td>
<td>2 TIMES DAILY</td>
<td>08/29/15 16:05</td>
</tr>
</tbody>
</table>

- Enoxaparin (Injection) Syrg 60 mg
Rules

- Active warfarin order and INR 1.5 or less or 3.5 or greater. Scores 2 points.
Rules

- Active anticoagulant and has CrCl less than 30 ml/min. Scores 2 points.
Columns

- Patient list has a review column for each of the rules.
- Displays a red dot if the patient has never been reviewed.
- Displays a green dot for patient that has been reviewed in the last 12 hours.
- Displays a yellow dot if it has been more than 12 hours since the patient was last reviewed.
<table>
<thead>
<tr>
<th>Patient Name/Age/Sex</th>
<th>Room/Bed</th>
<th>CrCl</th>
<th>PTT</th>
<th>INR</th>
<th>Platelet Count</th>
<th>VTE Prophylaxis Ordered</th>
<th>Rx Anticoagulant Infusion with Non-Tx PTT Review</th>
<th>Rx Anticoagulant (non-warfarin) and INR &gt; 2</th>
<th>Rx Anticoagulant (non-warfarin) and PLT &lt; 100,000 or 50% decrease or none.</th>
<th>Rx Anticoagulant Warfarin and INR &lt; 1.5 or &gt; 3.5 or no INR in 3 days</th>
<th>Rx Anticoagulation Dosing Review</th>
<th>Rx Anticoagulation Score Change</th>
<th>Rx Anticoagulation Time Since Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0135/1</td>
<td>37.3 mL/min</td>
<td>PTT: 32.6 sec (Final) at 08/29/15 2258 INR: 1.3 (Final) at 09/04/15 0520</td>
<td>76,000 (Final) at 09/04/15 1030</td>
<td>✔ 2</td>
<td>0</td>
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<td>09/14 hrs 34 mins</td>
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<tr>
<td>0142/2</td>
<td>12.3 mL/min</td>
<td>No results found for this basename: PTT</td>
<td>No results found for this basename: INR</td>
<td>379,000 (Final) at 09/04/15 0530</td>
<td>✔ 1</td>
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<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>09/14 hrs 32 mins</td>
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</tbody>
</table>
Scoring report

- Displays explanation of what scored for the patient.
- Displays the medications that scored in the rules.
- Link to the order report for each medication displayed.
- Link to anticoagulation monitoring report which pulls information from throughout the chart pertinent to anticoagulation monitoring.
- Link to documentation for scoring system review. Creates a pharmacist intervention. Can be copied to a progress note.
<table>
<thead>
<tr>
<th>Patient Name/Age/Sex</th>
<th>Room/Bed</th>
<th>CCI</th>
<th>INR</th>
<th>Platelet Count</th>
<th>VTE Prophylaxis Ordered</th>
<th>Rx Anticoagulant Infusion with Non-Tx PTT Review</th>
<th>Rx Anticoagulant (non-warfarin) and PLT &gt; 100,000 or 50% decrease</th>
<th>Rx Anticoagulant Warfarin and INR &lt; 1.5 or INR &gt; 3.5 or INR &gt; 3.0 in 3 days</th>
<th>Rx Anticoagulant Renal Dosing Review</th>
<th>Rx Anticoagulant Score Change</th>
<th>Rx Anticoagulant Time Since Reviewed</th>
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<tr>
<td>Vegetable, T (42 y.o. M)</td>
<td>TRN10 1C Pool Room 01/NONE</td>
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<td>Ventura, J (53 y.o. M)</td>
<td>TRN RX Pool Room 02/NONE</td>
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<td>Cerebus, P (49 y.o. F)</td>
<td>TRN22 1C Pool Room 01/NONE</td>
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<td>Catopolas, P (49 y.o. F)</td>
<td>TRN21 1C Pool Room 01/NONE</td>
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## Anticoagulants
- enoxaparin Syringe

## Labs
- INR
- Hemoglobin
- Hematocrit
- Platelets
- Creatinine
- Heparin Anti-Xa, L
- Heparin Induced PL

## Weight
- 145 lb 2...

## Heparin Infusions
- Dose (unit/hr) Hep...
- Dose (unit/kg/hr)...
- Rate Heparin...
Platelet count ordered for in a.m.
Summary

- The need to focus on anticoagulation monitoring to improve patient safety is well documented.
- We have made significant improvement in the tools we have available for clinical monitoring.
- An anticoagulation scoring system in the EMR can facilitate pharmacists clinical monitoring and documentation.
Questions
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