Minimizing Unnecessary Coagulation Testing in the ED

Quality and Safety Summit
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Conflict of Interest

• I have no conflicts of interest

• Team members: Eddy Lang, Tom Rich, Heather Hair, Chris Naugler, Kathy Yiu and IT team
Objectives

Describe a simple, sustainable intervention to reduce unnecessary coagulation (PTT/INR) in ED patients.
Step 1: Scope of the problem

Over 300,000 ED Visits in YYC

Over 175,000 PTT or PT’s Performed on ED pts

30,000 PTT or PT’s in cardiac chest pain pts
Step 2: What is the evidence?

COMMON ROUTINE COAG TESTING SCENARIOS

• ED Chest pain patients
• “Bundling of PTT/PT”
• Pre-op testing for low risk
  patients/procedures

Step 3: Identify facilitators and barriers

- Stakeholders
- Understand your local process
- Leverage local resources
Step 4: Implementation

EDRN Cardiac Chest Pain Protocol [9 orders of 15 are selected]

- Hematology
  - Complete Blood Count (CBC)

- Chemistry
  - Chem Panel 7 (Na, K, Cl, CO2, Cr, Glu, Urea)
  - Troponin

- Coagulation
  - PT INR/PTT Group

Phase 1

- PT INR

Phase 2

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RESULTS: ED PATIENTS

REDUCTION FROM 46/100 ED PTS TO 25/100
Summary

• This multi-faceted intervention
  – Reduction of 157,278 PTT or PT’s (decrease of 49.8%)
  – Bundling of tests decreased from 90% to 57%
  – Changes have persisted over time
Questions?
Limitations

• Unable to determine appropriateness of PTT/INR

• PT/PTT now underutilized?

• Generalizability
Step 6: Why this project succeeded?

- Low Hanging Fruit
- Passive Intervention (from a Clinician’s perspective)
- Physician/RN Engagement/Departmental support
- Intervention aligned with evidence and clinicians experience
- Focused on appropriateness, not costs (editorial)
## STEP 5: MEASURE

<table>
<thead>
<tr>
<th></th>
<th>ED visits</th>
<th>% Admitted (range)</th>
<th>UC visits</th>
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<tbody>
<tr>
<td>Pre-OS changes</td>
<td>506,679</td>
<td>16.8% (12-23%)</td>
<td>168,141</td>
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<td>(19 months)</td>
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<td>Post-OS changes</td>
<td>479,347</td>
<td>17.7% (12-24%)</td>
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Secondary Outcomes – Phase 1

- No change in MD ordering rates
  - 219 PTT and INR 90 d pre
  - 218 PTT and INR 90 d post

- Total Number of coags
  - Pre – 18,327
  - Post - 12,769 (an additional 1352 fewer coags)

- % INR abnormal
  - Pre- 24.6%
  - Post – 29.7%
Step 1: What is the evidence?

- Common Scenarios in which *Routine* coagulation studies are unnecessary:
  - ED Chest pain patients
  - “Bundling of PTT/PT”
  - Pre-op testing for low risk patients/procedures
Scope of the problem

• Over 175,000 PTT or INR studies done in Calgary Zone ED’s in 2014
  – >99% were bundled.

• Nearly 30,000 of these coags are ordered for ? Cardiac Chest Pain by RN OS
  – Compelling evidence that the yield of ordering routine PTT in CP patients is VERY LOW (<2%, Campbell)
## Results – 90 days pre/post

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<td>4982</td>
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Summary of evidence—PTT/INR in CP

- Campbell S. et al CAEP abstract 2014) – 78.7% of CP (?cardiac) had INR’s done (patients on Coumadin were excluded). Only 13 (1.8%) had abnormal INR – 12 of which were on a/c but not recorded in chart.

- Martin et al. Emerg Med J 2012, vol 29 pg 184. 640 pts with CP had coag studies – 79 were abnormal. All of these could be predicted on Hx (anticoagulant use or liver disease) OR were trivial (4 patients, INR <1.5).

- Schwartz et al. 23 patients (13%) of patients admitted with ACS had INR >1.25. 20 Of these patients had hx of anticoag usage or liver disease or daily. In the remaining 8 patients (mean INR was 1.44) no change in therapy was initiated based on these abnormalities.
References

1 http://www.acepnow.com/article/emergency-physicians-can-reduce-unnecessary-coagulation-testing-patients-chest-pain/
4 Kitchens, CS. (2005). To bleed or not to bleed? Is that the question for the PTT?. Journal of Thrombosis and Haemostatis, 3:2607-2611
6 Campbell SG, Magee, K., Cajee, I., Field, S., Butler, M., Campbell CL. (2014). The utility of measuring international normalized ratio (INR) as part of the investigation of patients with cardiac-type chest pain. CAEP/ACMU 2014 Scientific Abstracts. May 31 to June 4, 2014