Putting your Campaign Tools to Work

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Please submit your questions for the moderated question and answer session
Webinar Topics

• Program Update
• Tools supporting Risk-Concordant Care
• Toolkit Grand Tour
153 Facilities opted in
Features
The Reduce the Risk: PCI Bleed Campaign leverages evidence-based best practices to improve the care and outcomes of patient who have undergone a percutaneous cardiovascular intervention (PCI).

Assessment
Includes benchmarking data and is designed to identify opportunities for improvement.
Read more...

Toolkit
Specific tools and strategies designed to address one general topic area for improvement.
Read more...

Webinars
Listen to webinars that review evidence-based toolkits and lessons learned.
Read more...

Listserv
Collaborate and interact with others.
# Reduce the Risk: PCI Bleed Toolkit

The table below displays the Reduce the Risk: PCI Bleed Campaign metrics and the tools and strategies to support facilities participating in this Quality Campaign. These tools and strategies are resources available to all participating facilities to assist with meeting the goal of decreasing overall bleeding events.

Metric 1: In-hospital risk-standardized rate of bleeding events for all PCI patients.
Metric 2: Proportion of PCI procedures with transfusion of whole blood or red blood cells.
Metric 3: Procedures with an observed bleeding event.
Metric 4: Antiplatelet utilization.
Metric 5: Access site utilization.
Metric 6: Method for closure for arterial access site.

Check back for more tools coming soon!

## Preprocedural (Tools to address Metric #1 and 6)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric 1: In-hospital risk-standardized rate of bleeding events for all PCI patients</td>
<td>CathPCI Bleeding Risk Calculator App</td>
</tr>
<tr>
<td>Metric 3: Procedures with an observed bleeding event</td>
<td>Pre-PCI Procedure Orders</td>
</tr>
<tr>
<td>Metric 6: Method for closure for arterial access site</td>
<td>Risk-Concordant Framework for Bleed Avoidance Strategies</td>
</tr>
</tbody>
</table>
CathPCI Bleeding Risk Calculator App

Available in the iTunes and GooglePlay app stores

Web platform: tools.acc.org/CathPCIBleedRisk
Calculate Risk

Inputs:

- Age
- Sex
- Race
- Height
- Weight
- Baseline Hgb
- Prior STEMI
- Prior PCI
- Cardiogenic shock within 24 hours
- Dialysis
Output: Predicted Risk

Patient bleeding event risk compared to national average risk

Predicted Risk

Adjusted CathPCI Bleeding Event Risk

<table>
<thead>
<tr>
<th>Patient's Risk</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.5%</td>
<td>3.3%</td>
</tr>
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In the United States, the average bleeding event risk for all patients undergoing this procedure is 3.3%. Taking into account the patient's specific clinical condition, the statistical estimate that the patient may experience a bleeding event is 15.5%. This means that for every 100 patients having a similar clinical makeup, there would be 15 that experienced a bleeding event.

Bleeding Event is an absolute drop in

Patient Demographics

- Age: 55 Years
- Sex: Female
- Race: Black or African American

Patient Pre-Procedural Characteristics

- Body Mass Index (BMI): 31.32 kg/m²
- Height: 5 Feet 7 Inches
- Weight: 200 lbs
- Baseline Hemoglobin: 15 g/dL
- Prior STEMI: ✓ No
- Prior Cardiogenic Shock: ✓ Yes
- Prior PCI: ✓ No
- Dialysis: ✓ Yes
- Glomerular Filtration Rate (estimated): N/A
- Serum Creatinine (SCr): N/A
The predicted risk of mortality is: 24.1%
The risk of blood transfusion (whole blood or packed cells) is: 26.4%
The predicted risk of CIN is: 18.0%
## App Comparison

<table>
<thead>
<tr>
<th></th>
<th>ACC CathPCI Bleeding Risk Calculator App</th>
<th>SCAI PCI Risk Calculator App</th>
</tr>
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<tr>
<td><strong>Development</strong></td>
<td>-Based on the 2013 Updated Bleeding Risk Model and NCDR CathPCI Registry</td>
<td>-Based on risk models developed by the NCDR CathPCI Registry and the Massachusetts Data Analysis Center</td>
</tr>
</tbody>
</table>
| **Scope**                | -Estimates individual PCI-related bleed risk to the National Average bleed risk  
                          | -Intended for use as part of pre-procedure assessment | -Estimates in-hospital mortality, acute kidney injury (AKI), and need for a transfusion  
                          |                                                                 | -Intended for use as part of pre-procedure assessment |
| **Units of Measure**     | -US or SI | -US |
| **Inputs**               | -Fewer inputs captured to produce estimated bleed risk | -More inputs are captured to produce three categories of risk. |
| **Bleeding Risk v. Transfusion** | -Bleeding event defined as an absolute drop in hemoglobin >4 g/dL, a RBC transfusion and/or a procedural intervention/surgery to reverse/stop bleeding that occurs within 72 hours of the PCI procedure | -Transfusion defined as: reflects any transfusion of either whole blood or packed red blood cells between the start of the PCI procedure and until the next procedure or discharge. |
| **Email function**       | -Able to email a brief summary of session | -No email function |
Reversing the “Risk-Treatment Paradox” of Bleeding in Patients Undergoing Percutaneous Coronary Intervention: Risk-Concordant Use of Bleeding Avoidance Strategies Is Associated With Reduced Bleeding and Lower Costs

Background—Bleeding is a common, costly, and costly complication of percutaneous coronary intervention. While bleeding avoidance strategies (BAS) are effective, they are underutilized. The risk-concordant use of BAS and reduce the risk-treatment paradox of bleeding in patients undergoing PCI.

Methods and Results—We applied the risk-concordant strategies of bleeding avoidance in patients undergoing PCI. We conducted a cohort study of 1,510 patients undergoing PCI at a tertiary care center. The mean age was 68 years, and 74% were male. The mean Charlson Comorbidity Index was 1.7. The primary outcome was major bleeding, defined as a decrease in the risk-treatment paradox of bleeding. We found that the risk-concordant strategies of bleeding avoidance reduced the risk of bleeding by 2.9% per year, which was statistically significant (p = 0.001).

Conclusion—In conclusion, risk-concordant strategies of bleeding avoidance can effectively reduce the risk-treatment paradox of bleeding. These strategies should be implemented in all patients undergoing PCI to optimize outcomes.

Key Words: anticoagulants • bleeding • cost • percutaneous coronary intervention • radial artery catheter

Risk-concordant Care: Why & How
The “Risk-Treatment Paradox”
Risk Assessment
Assess Bleeding Risk

1. Risk Assessment
   - Low: ≤2%
   - Moderate: >2.0% ≤6.5%
   - High: >6.5%

2. Bleed Avoidance Strategy (BAS)
   - None of these (or operator preference)
   - One or more:
     - radial access
     - bivalirudin
     - closure devices
   - Two of these:
     - radial access
     - bivalirudin
     - closure devices

3. Outcomes
   - Improved Costs
   - Reduced Bleeding

*The efficacy of bivalirudin with radial PCI is debatable, and the efficacy of closure devices in femoral PCI is debatable, but they may be considered if bleeding risk is moderate to high.*
Figure 2. Trends in risk-concordant use of bleeding avoidance strategies (BAS), bleeding rates, and hospitalization costs. A, Quarterly estimates of risk-concordant BAS use, bleeding rates, and hospitalization costs. Dashed, color-coded lines represent the least squares regression lines. B, Comparison of risk-concordant BAS use, bleeding rate, and hospitalization costs before (hollow bars) and after (solid bars) implementation of the patient-centered approach. \( P \), significance values estimated using chi-square test for risk-concordant BAS use and bleeding rates and using Mann-Whitney U test for hospitalization costs. Costs are shown as inflation-adjusted 2016 US$. The corresponding regression equations are as follows: logit (proportion risk-concordant) = 0.0275 × quarter - 0.0727; logit (bleeding rate) = -0.0698 × quarter - 2.8242; hospitalization cost = -250.23 × quarter + 21 088.68. Q indicates quarter.
Reduce the Risk: PCI Bleed Toolkit

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<td>Arterial Access Protocol for PCI</td>
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<tr>
<td>Metric 2: In-hospital risk-standardized rate of bleeding events for all PCI patients</td>
<td>Competency Arterial and Venous Sheath Removal</td>
</tr>
<tr>
<td>Metric 3: Access site utilization</td>
<td>Post PCI Sheath Removal Checklist</td>
</tr>
<tr>
<td>Metric 4: Access site utilization</td>
<td>Post PCI Sheath Removal Protocol</td>
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<td>Metric 5: Method for closure for arterial access site</td>
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**Postprocedural (Tools to address Metric #1, 5, and 6)**

**Pharmacotherapy (Tools to address Metric #1, 2, 3, 4, 5, 6)**
These are a few of my favorite things
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**COMPETENCY: Arterial & Venous Sheath Removal**

**Name:**

**Date:**

**Title:**

**Employee Number:**

**Unit:**

**Skill or Competency Statement:**

1. Lists patient information to be collected prior to initiation of the procedure.
3. Explains sheath removal process to patient and/or family.

**Self-Assessment:**

☐ Experienced
☐ Need practice
☐ Never done
☐ Not applicable (based on scope of practice)

**Method:**

☐ Verbal
☐ Demonstration/observation
☐ Practical exercise
☐ Interactive class

**Skill Level:**

- Demonstrated:
  - Beginner
  - Orientation
  - Annual
  - Intermediate
  - New
  - Requirement
  - Expert
  - Refinement

**Reason:**

**Performance Criteria:**

1. Validates physician order for sheath removal and target ACT/PTT is at goal for Heparin dosing only.
2. Offers explanation to patient.
3. Administers analgesia or other medication as ordered by the physician prior to sheath removal.
4. Obtains necessary equipment and trained personnel.
5. Provides for privacy.
6. Performs baseline assessment of circulatory status and access site.
8. Washes hands and dons gloves.
9. Removes dressing and sutures as indicated.
10. Opens supplies.
11. Dons sterile gloves.
12. Removes arterial sheath then venous sheath according to procedure.
13. Assesses and documents the following every 5 minutes during manual arterial compression:
   - BP and pulse
   - Monitored rhythm
   - Pulse oximetry

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**Table of Incidence and Definition:**

<table>
<thead>
<tr>
<th>GRADE</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCIDENCE</td>
<td>&gt; 5%</td>
<td>&lt; 3%</td>
<td>&lt; 2%</td>
<td>&gt; 0.1%</td>
<td>&lt; 0.01%</td>
</tr>
<tr>
<td>DEFINITION</td>
<td>Local hematoma, superficial</td>
<td>Hematoma with moderate muscular infiltration, below the elbow</td>
<td>Hematoma and muscular infiltration extending above the elbow</td>
<td>Ischemic threat (compartment syndrome)</td>
<td></td>
</tr>
<tr>
<td>TREATMENT</td>
<td>Analgesia, additional bracelet, local ice</td>
<td>Analgesia, additional bracelet, local ice, inflamed BP cuff</td>
<td>Analgesia, additional bracelet, local ice, inflamed BP cuff</td>
<td>Consider surgery</td>
<td></td>
</tr>
<tr>
<td>NOTES</td>
<td>Inform physician</td>
<td>Inform physician</td>
<td>Inform physician</td>
<td>STAT call to physician</td>
<td></td>
</tr>
<tr>
<td>REMARKS</td>
<td>- Control blood pressure (BP) (importance of pain management)</td>
<td>- Consider interruption of any antimicrobial and/or anticoagulant infusion</td>
<td>- Follow forearm and arm diameters to evaluate requirement for additional bracelet and/or inflamed BP cuff inflation</td>
<td>- Additional bracelet(s) can be placed alongside artery anatomy</td>
<td>- Ice cubed in a plastic bag or washcloths are placed on the hematoma</td>
</tr>
</tbody>
</table>

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**Image Description:**

A diagram titled "EASY Hematoma Classification after Transradial/Ulnar PCI" with classifications I, II, III, and IV for different grades of hematoma. The table outlines grades I to V with corresponding definitions, treatments, and notes for each grade. The diagram includes visual aids to represent the locations and classifications for radial and ulnar hematoma. Additional medical terminology and procedures are described in the accompanying text.
These are a few of my favorite things

**Figure 3**

**Guidance for Administering Reversal Agents**

- **VIA (antiplatelet)**
  - Adrenalin 0.01 mg/kg
  - Morphine 1 mg/kg
  - Atropine 0.5 mg/kg

- **DTP (dilation)**
  - Adrenalin 0.01 mg/kg
  - Morphine 1 mg/kg
  - Atropine 0.5 mg/kg

- **Fibra inhibitor (thrombo, etox is, noenox)**
  - Adrenalin 0.01 mg/kg
  - Morphine 1 mg/kg
  - Atropine 0.5 mg/kg

- **GFO (glycoprotein IIb/IIIa inhibitors)**
  - Adrenalin 0.01 mg/kg
  - Morphine 1 mg/kg
  - Atropine 0.5 mg/kg

- **Before patient is stable, consider restarting anticoagulation (see Figure 4)**

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**Arterial Access Protocol for PCI**

PCIs are performed via three access sites: brachial, radial or femoral with the latter two being the most common routes. Vascular complications can affect the well-being of the patient and the effectiveness of the clinician to follow.


**Access Sites**

1. **Brachial**
   - a) Cut down
   - b) Percutaneous
     - 1. Performed by attending Interventionalist or Vascular Surgeon.

2. **Radial**
   - a) Percutaneous
     - 1. Performed by attending Interventionalist or Fellow.

   - 2. Set up Access
     - a) Confirm no contraindications.
     - 1. Known PAD in upper extremity used for access.
     - 2. Vitamin K's
     - 3. RUQ's disease
     - 4. Patient refuses.
   
   - b) Patient on monopsonic per standard protocol.
   - c) Place arm on arm board with wrist joint hyper-extended.
   - d) Remove excess hair.
   - e) Sterile prep and drape.
   - f) Palpate radial pulse.

   - g) Administer local anesthetic over radial pulse 1 cm proximal to radial styloid process.

   - h) Obtain Access either with Seldinger venous sheath, catheter over needle system or puncture-needle with wire sheath, nitroglycerin 100-400mcg, verapamil 2.5mg, and heparin 250-500ui.

   - i) Administer unfractionated heparin at a dose 50-70 ui/kg either intra-arterial or intravenously at same time after access and prior to angiography.
Take note!

• Claim MIPS Credit by April 2\textsuperscript{nd}
• Join us at the Quality Summit March 13\textsuperscript{th}
• Next webinar: May 22\textsuperscript{nd}
Please submit your questions for the moderated question and answer session