Reducing “Inappropriate” Percutaneous Coronary Intervention Procedures in a Multi-Hospital, Academic Healthcare System

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Disclosures

None
Background/Objective

Appropriate Use Criteria (AUC) for Coronary Revascularization:¹

• History
  • Rising healthcare costs
  • Variability in use of cardiovascular procedures
  • Created in 2009

• Purpose
  • Provide guidance on suitability of revascularization
  • Measure utilization patterns

• Definitions (per 2012 update):
  • Appropriate
  • Maybe appropriate (“Uncertain”)
  • Rarely appropriate (“Inappropriate”)

Objective: To reduce rates of “rarely appropriate” PCI procedures to below the national median.
Methods

• Data collected from CathPCI Registry quarterly reports

~3000 hospitals
> 2000 cardiologists
~20 million clinical records
Methods

• Four system-wide initiatives were implemented from 2012 to 2015:
  1. Email notification after “rarely appropriate” elective PCI
  2. Dedicated cardiac catheterization lab conferences regarding AUC
  3. Incorporate AUC into catheterization note templates
  4. Dissemination of annual scorecards to interventional cardiologists
Results

R4Q Rates of "Rarely Appropriate" Elective PCI Procedures from 2012-2015

- 2012 AUC update
- Initiated ongoing AUC education for providers, encouraged iCath use
- First release of scorecards to interventionalists (now annually)
- Assumed oversight of CathPCI registry for Hospital 3 (recently joined our health system)
- Began notifying interventionalists by email following “inappropriate” PCI procedures
- New PCI procedure note templates launched in EMR

Proportion of Rarely Appropriate PCIs Performed

- Hospital 1
- Hospital 2
- Hospital 3
- Hospital 4
- U.S. Median

Conclusion

• “Rarely appropriate” PCI rates fell below the national median within 3 years in all four hospitals.

• Future Directions:
  • Integrate AUC during procedure time-out
  • Assess for association with patient outcomes
  • Apply methodology to additional catheterization metrics
Acknowledgements

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### Supplemental Material

#### Health System Demographics and Patient Characteristics (R4Q from 2011Q3 to 2012Q2)

<table>
<thead>
<tr>
<th></th>
<th>Hospital 1</th>
<th>Hospital 2</th>
<th>Hospital 3</th>
<th>Hospital 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of PCI procedures</td>
<td>721</td>
<td>817</td>
<td>923</td>
<td>238</td>
</tr>
<tr>
<td>Age (median, years)</td>
<td>65</td>
<td>63</td>
<td>65</td>
<td>63</td>
</tr>
<tr>
<td>Male</td>
<td>62.9%</td>
<td>59.4%</td>
<td>64.0%</td>
<td>62.4%</td>
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<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>72.0%</td>
<td>56.8%</td>
<td>82.3%</td>
<td>71.6%</td>
</tr>
<tr>
<td>Black</td>
<td>25.8%</td>
<td>41.9%</td>
<td>13.2%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Other*</td>
<td>2.3%</td>
<td>1.5%</td>
<td>4.5%</td>
<td>15.9%</td>
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<tr>
<td>Insurance Payors (not mutually exclusive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Private</td>
<td>52.4%</td>
<td>33.7%</td>
<td>83.8%</td>
<td>57.5%</td>
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<tr>
<td>Medicare</td>
<td>57.2%</td>
<td>55.0%</td>
<td>55.0%</td>
<td>39.6%</td>
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<tr>
<td>Medicaid</td>
<td>10.0%</td>
<td>6.7%</td>
<td>5.3%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Other **</td>
<td>2.0%</td>
<td>0.4%</td>
<td>1.6%</td>
<td>1.6%</td>
</tr>
<tr>
<td>None</td>
<td>3.8%</td>
<td>9.7%</td>
<td>4.8%</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

#### Physician Practice Type

<table>
<thead>
<tr>
<th>Physician Practice Type</th>
<th>All Faculty</th>
<th>Mostly Faculty</th>
<th>Combined Faculty/Private</th>
<th>Combined Faculty/Private</th>
</tr>
</thead>
</table>

* Other races include Asian, American Indian/Alaskan, Hawaiian/Pacific Islander
** Other payors include military, state, Indian Health Service, or non-US insurance

<table>
<thead>
<tr>
<th>Performance metric</th>
<th>Individual [in/N]</th>
<th>Individual Performance</th>
<th>EUH</th>
<th>EUHM</th>
<th>ESJH</th>
<th>EJC</th>
<th>U.S. median</th>
<th>U.S. top decile</th>
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</thead>
<tbody>
<tr>
<td>PCI in-hospital risk-adjusted mortality (O to E ratio)</td>
<td>1/150</td>
<td>0.98</td>
<td>0.84</td>
<td>0.67</td>
<td>0.87</td>
<td>0</td>
<td>1.03</td>
<td>-</td>
</tr>
<tr>
<td>PCI in-hospital risk-adjusted mortality (O to E ratio), STEMIs only</td>
<td>1/15</td>
<td>1.15</td>
<td>0.45</td>
<td>0.48</td>
<td>0.97</td>
<td>0</td>
<td>1.06</td>
<td>-</td>
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<tr>
<td>PCI in-hospital risk-adjusted rate of bleeding events (O to E ratio)</td>
<td>4/150</td>
<td>1.33</td>
<td>1.98</td>
<td>1.23</td>
<td>1.02</td>
<td>0.21</td>
<td>1.00</td>
<td>-</td>
</tr>
<tr>
<td>Rate of radial access, diagnostic cath procedures (%)</td>
<td>150/300</td>
<td>50%</td>
<td>31.9</td>
<td>50.9</td>
<td>42.5</td>
<td>15.2</td>
<td>30.0</td>
<td>-</td>
</tr>
<tr>
<td>Rate of radial access, PCIs (%) *</td>
<td>60/150</td>
<td>40%</td>
<td>32.8</td>
<td>39.0</td>
<td>32.8</td>
<td>11.3</td>
<td>26.5</td>
<td>-</td>
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<tr>
<td>Rate of &quot;not classifiable&quot; PCI procedures per Appropriate Use Criteria for Revascularization due to inadequate documentation (%) **</td>
<td>5/150</td>
<td>3.3</td>
<td>2.6</td>
<td>1.0</td>
<td>8.0</td>
<td>3.0</td>
<td>3.6</td>
<td>0.3</td>
</tr>
<tr>
<td>Rate of &quot;inappropriate&quot; PCI procedures for patients without ACS (%) **</td>
<td>3/20</td>
<td>15.0</td>
<td>13.9</td>
<td>6.3</td>
<td>10.6</td>
<td>0.0</td>
<td>12.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Median time to primary PCI for STEMI (minutes)</td>
<td>15</td>
<td>55</td>
<td>56</td>
<td>56</td>
<td>65</td>
<td>61</td>
<td>60</td>
<td>49</td>
</tr>
</tbody>
</table>

* Excludes same-day procedures where diagnostic cath and PCI were performed by two different attendings.
** These AUC rates have been adjusted for the individual physician scorecards to exclude OHT and TAVR patients, but the hospital and U.S. benchmarks include these patients.
Rate of "inappropriate" PCI's among patients without ACS; 2014Q2 through 2015Q1; only operators with ≥ 10 elective procedures included
Proportion of PCI procedures not classifiable for AUC reporting, each point is R4Q value

Q-HIP threshold & points for AUC not classifiable:
≤ 5%: 2 points

- EUH
- EUHM
- ESJHA
- EJC
- U.S. median