Accuracy of Emergency Nurse Triage of Patients with Symptoms Suggestive of Acute Myocardial Infarction

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Sigma Theta Tau Mu Kappa chapter
Author Disclosures

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* I have no conflicts of interest to disclose.
* Employer: Georgia Southern University
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Following this presentation, the learners should be able to identify:

a) the subtle symptoms of AMI and
b) their own possible biases when interacting with patients in need of emergent care.
ANNUALLY...

* 6 million people present to an ED  cc: chest pain
* 6 million more present w symptoms of possible AMI
* 1 million are diagnosed with AMI
* 350,000 die during the acute phase

Murphy et al. (2013); NCHS (2008); IHI (2009)
Standards of ED
Cardiac Care

* Obtain ECG <10 min
* See a healthcare provider <10 min
* Door to Needle <30 min
* Door to Balloon <90 min

Standards of ED
RN Triage

* Experienced RN in role
* Triage in 2-5 min
* level system (3 or 5)
Specific Aim

To determine if patient characteristics (gender, age, race/ethnicity, symptom presentation) & nurse characteristics (age, years of experience, and education) affect accuracy of ED RN triage of patients with symptoms suggestive of AMI.
Donabedian Model

Structure: gender, age, race of RN and patient, symptom presentation

Process: Triage process, interpersonal interaction

Outcomes: Accurate triage level designation
<table>
<thead>
<tr>
<th>Authors</th>
<th>Accuracy rate</th>
<th>sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considine, Ung, &amp; Thomas (2000)</td>
<td>58%</td>
<td>31 RNs</td>
</tr>
<tr>
<td>Considine, LeVasseur, &amp; Villanueva (2004)</td>
<td>61%</td>
<td>322 RNs</td>
</tr>
<tr>
<td>Goransson, Ehrenberg, Marklund, &amp; Ehnfors (2005)</td>
<td>57.6%</td>
<td>423 RNs</td>
</tr>
<tr>
<td>Wilper et al. (2008)</td>
<td>70% in pts w AMI</td>
<td>92,173 patients</td>
</tr>
<tr>
<td>Atzema, Austin, Tu, &amp; Schull (2009)</td>
<td>50% in pts w AMI</td>
<td>3,088 patients</td>
</tr>
<tr>
<td>Atzema, Schull, &amp; Tu (2011)</td>
<td>67.6% in pts w AMI</td>
<td>680 patients</td>
</tr>
</tbody>
</table>
Lit Review: Patient Characteristics

- Females are judged less urgent
- African Americans are judged less urgent
- Age bias is noted in triage decisions, ECG obtainment, and hospitalization decisions.
* Incidence of classic symptoms during an AMI as low as 67% in previous studies
* Gender & race specific symptoms
* Diabetes changes the picture
* Atypical symptoms may impact triage
<table>
<thead>
<tr>
<th>Authors</th>
<th>Results</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considine et al. (2000)</td>
<td>No relationship</td>
<td>31 RNs</td>
</tr>
<tr>
<td>Considine, Ung, &amp; Thomas (2001)</td>
<td>Positive correlation BSN &amp; accuracy; no relationship ED experience &amp; accuracy</td>
<td>31 RNs</td>
</tr>
<tr>
<td>Worster et al. (2004)</td>
<td>Experience not related to consistence in triage</td>
<td>10 RNs</td>
</tr>
<tr>
<td>Arslanian-Engoran (2004)</td>
<td>No association between experience and accuracy</td>
<td>13 RNs</td>
</tr>
<tr>
<td>Goransson, Ehrenberg, Marklund &amp; Ehnfors (2006)</td>
<td>No relationship between accuracy and education or experience</td>
<td>423 EDs</td>
</tr>
</tbody>
</table>
A descriptive correlational study using retrospective data from the EMR

IRB approval was obtained from both the healthcare system and Georgia State University.
One healthcare system in the Southeast that operates two EDs at separate geographical sites.
Patients 21 years old and greater with symptoms suggestive of AMI were included.

Patients in critical condition were excluded.
Record selection

* 559 records
  * - 175 via ambulance
  * - 98 obvious source non-cardiac
* = 286 records (accuracy, patient characteristics)
* - 92 records (no RN consent)
* = 194 records (RN characteristics)
Male 48.1%; Female 51.9%
Caucasian 67.1%; African American 31.1%
Most of the patients were non-smokers (74.6%).
A majority of the patients (88.7%) reported chest pain.
Characteristics of Triage Nurses

- 70% female; 100% Caucasian
- Age range 26-64; mean 45
- 46% ADN; 19% BSN; 3.5% Diploma
- Nurse experience 3-35 years; mean 18
- ED Nurse experience 3-35 years; mean 11
* 54% of the patients that presented with symptoms suggestive of AMI were assigned a triage level of 2 (in a 5 level system).
## Logistic Regression Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of patient</td>
<td>.01</td>
<td>.01</td>
<td>.25</td>
<td>1.01</td>
</tr>
<tr>
<td>Male vs. female</td>
<td>-.37</td>
<td>.26</td>
<td>2.07</td>
<td>.69</td>
</tr>
<tr>
<td>Caucasian vs. non-Caucasian patient</td>
<td>.73</td>
<td>.28</td>
<td>6.58 *</td>
<td>2.07</td>
</tr>
<tr>
<td>No chest pain vs. chest pain</td>
<td>.94</td>
<td>.41</td>
<td>5.24 *</td>
<td>2.55</td>
</tr>
<tr>
<td>RN age</td>
<td>.07</td>
<td>.03</td>
<td>4.34 *</td>
<td>1.07</td>
</tr>
<tr>
<td>RN experience in years</td>
<td>-.03</td>
<td>.03</td>
<td>.53</td>
<td>.98</td>
</tr>
<tr>
<td>RN ED experience in years</td>
<td>-.05</td>
<td>.27</td>
<td>.04</td>
<td>.95</td>
</tr>
</tbody>
</table>
Discussion

* Accuracy and...
  * Patient Characteristics
  * Symptom Presentation
  * Nurse Characteristics
Limitations

* Retrospective EMR review
* Participation of RNs
* Other variables not identified that may impact triage
Strategies must be explored and implemented that will improve accuracy.

Targeted educational interventions:
- Initial education & ongoing competencies
- Discussion of peer-reviewed nursing literature
- Memory aids
- Clinical Case review and follow up
Three considerations in the research of triage RN accuracy in the ED for patients with suspected AMI…