Psychometric Testing of a PACU Discharge Scoring System

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Sharp Memorial Hospital
STTI 24th International Nursing Research Congress
July 22, 2013
About Our Hospital

- Part of integrated healthcare system
- 368 beds
- Baldrige winner, 2007
- Planetree designated, 2012
- Most beautiful, 2012 (Soliant Health)
- Most wired, 2012 (Hospitals and Healthnetworks Magazine)
Research Team

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Learning Objectives

At the completion of this session, the learner will be able to:

1. Describe a systematic process to evaluate practice and determine opportunities for improvement

2. Discuss the steps in developing and psychometrically testing a Post-Anesthesia Care Unit (PACU) discharge scoring system
Purpose and Background

- The purpose of the study was to develop and psychometrically test a PACU discharge scoring system.
- Currently, the PACU uses the REACT (Respiration, Energy, Alertness, Circulation, and Temperature) scoring system, but it does not accurately predict readiness for discharge from the PACU.
Clinical Issues with REACT

- Although a patient may score the maximum points (10) using the REACT system, pain and nausea tend to prolong the PACU stay.
- Additionally, anecdotal reports from receiving units indicate patients are not recovered fully from anesthesia and require a close observation.
Review of the Literature and Community Standard

- REACT
- Modified Aldrete
- The American Society of Peri-Anesthesia Nurses (ASPN) recommendation
- Magnet Research Listserv Query
Limitations of Scoring Systems

• REACT
  - The REACT system does not assess oxygenation, hypertension, pain, nausea, and resolution of spinal anesthesia.

• Modified Aldrete
  - The original system was developed in 1970 and modified in 1992 to include oximetry.
  - Like the REACT system, the Modified Aldrete does not address pain and nausea. It also does not address temperature.
ASPAHN Recommendation

• The American Society of Peri-Anesthesia Nurses (ASPAHN) standards. These standards are evidence-based, but do not commit to a specific tool.
Magnet Listserv Query

• A majority of the respondents indicated they used either the Modified Aldrete System or the ASPAN standards

• Most identified similar gaps in the Modified Aldrete System and indicated interest in development of a comprehensive, reliable, and valid system
Methods

• A 10-item tool was developed from other published tools and recommendations for discharge criteria described by:
  o American Society of Anesthesiologists
  o American Society of Peri-Anesthesia Nurses
Methods: Content Validity

- Experts in the field of the PACU setting, including nurses and anesthesiologists, assisted in establishing content and face validity.
- Each expert reviewed and evaluated the discharge assessment items and the proposed criterion.
Methods: Content Validity

• Experts scored the items and criterion with their level of agreement on a 4-point Likert Scale

• Content Validity Index (CVI) was calculated as a ratio of the aggregated mean score compared against a maximum possible score

• The CVI for the list of assessment items and the accompanying criteria was .80
<table>
<thead>
<tr>
<th>Item</th>
<th>Criterion</th>
<th>Y</th>
<th>N</th>
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</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Voluntary movement of all 4 extremities or similar to preoperative assessment</td>
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<tr>
<td>Respirations</td>
<td>12-20 breaths/min or within 10% of pre-op rate</td>
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<tr>
<td>Pulse</td>
<td>60-100 beats/min or within 10% of pre-op rate</td>
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<tr>
<td>BP</td>
<td>Systolic BP between 100 &amp; 160 Hg or pre-op level with 2 consecutive BPs 15 minutes apart</td>
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<tr>
<td>Temperature</td>
<td>Between 36.0 C/96.8 F &amp; 38.0 C/100.4 F orally</td>
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<tr>
<td>(O_2) Saturation</td>
<td>&gt;95% on room air or with supplemental (O_2) via nasal cannula</td>
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<tr>
<td>Consciousness</td>
<td>Accurately answers orientation questions or unchanged from pre-op status</td>
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<tr>
<td>Pain</td>
<td>Minimal discomfort or acceptable/tolerable to patient</td>
<td></td>
<td></td>
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<tr>
<td>Nausea</td>
<td>None/mild nausea with no active vomiting</td>
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<tr>
<td>Surgical Bleeding</td>
<td>Minimal/no dressing changes or consistent with procedure</td>
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Methods: Inter-rater Reliability

- Established inter-rater reliability using physical assessment data recorded on the patient’s medical record:
  - Two nurses scored the patient’s readiness for discharge independently and indicated with a yes or no that the patient met the criteria for discharge
  - Examined the level of agreement between the two nurses’ independent scores to establish inter-rater reliability
Methods: PACU Length of Stay

• Recorded the time that the patient met the discharge criteria and was determined to be ready for discharge using the REACT tool and the new tool

• Compared differences in readiness for discharge using REACT and the new tool
Results: Inter-rater Reliability

• There was 100% agreement among nurses for 202 patients scored using the new system
Results: PACU Length of Stay

• There was a mean (average) difference of 27 minutes (over 122 cases) between the discharge times using the REACT data set as compared to the new tool

• The new tool did not result in statistically significant increase or decrease of time spent in the PACU compared with REACT
Post Hoc Assessment of the Efficacy of the Tool

• Rapid Response Team (RRT) calls decreased by 50% from 6% to 3% (overall RRT calls, prior PACU stay)

• The decrease in RRT calls may be a byproduct of the study; the result of increased knowledge and skill in assessing the patient’s readiness for discharge (Hawthorne Effect)
Next Steps

• Obtain Anesthesia Supervisory Committee approvals at 5 hospitals
• Revise standardized procedure (interdependent practice in California)
• Perform competency assessment for all PACU nurses
• Update system in electronic medical record
Conclusion

• The new discharge scoring system:
  o is valid and reliable
  o accurately predicts patient readiness for discharge from the PACU setting
  o Increases patient safety
Questions?
References

Contact Information

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