AN EVALUATION OF ANESTHESIA-RELATED PERIOPERATIVE SCHEDULING AND MANAGEMENT USING EPIC OPTIME: BARRIERS IN USER INTERFACE / USER EXPERIENCE

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Objectives

UNDERSTAND BACKGROUND AND WHY

OVERVIEW OF PROCEDURE SITES AND ISSUES

DESCRIBE POSSIBLE SOLUTIONS

DISCUSSION AND NEXT STEPS
Background

• Investigate workflow in anesthesia-related perioperative scheduling and procedure tracking via UI/UX
• Project conducted at UHealth Tower / SCCC at University of Miami
• Want to identify the barriers in UI/UX that prohibits the proper scheduling of anesthesia resources and tracking of perioperative events for improved OR management
• Utilize EPIC OpTime and Radiant
Background

- Scheduling: When a case is scheduled, there is an attribute that marks if the case needs anesthesia resources or not. If not, this case doesn’t not appear on the anesthesia personnel schedules, so it is not staffed.

- Perioperative Tracking: We use Real-Time Locating System (RTLS) in certain sites as well as manual entry by procedure nurses to electronically track the progress of any given case. These two methods have problems with delays and dysfunction.
Why?

• I am an Anesthesiologist and a Board Runner
• Directly and indirectly responsible, daily, for over 15 anesthesiologists and 45 nurse anesthetists and anesthesiology residents
• Want to efficiently utilize anesthesia resources via the schedule
• We need to know which cases need anesthesia, and when they start and end so we know who is available at any given moment
Sites | Main OR

• Resource Scheduling
  • Optimal functioning of scheduling
  • Automatic default anesthesia resource request for all cases in Main OR
  • Cases automatically always appear on Epic snapboard for anesthesia resource allocation

• Perioperative Tracking
  • Optimal functioning of tracking systems
  • Combination of RTLS and manual entry
  • Problems with new ORs 15, 16, and 17 due to vicinity to holding areas; requires manual entry to fix
  • Problems with holding area location; patients in the ‘pool’
Sites | Ambulatory OR

- **Resource Scheduling**
  - Appropriate functioning of scheduling
  - Automatic default anesthesia resource request for all cases in Amb OR
  - Cases automatically always appear on Epic snapboard for anesthesia resource allocation

- **Perioperative Tracking**
  - Appropriate functioning of tracking systems
  - Combination of RTLS and manual entry
  - Problems with holding area location; patients in the ‘pool’
Sites | Endoscopy / GI

- **Resource Scheduling**
  - Scheduling discrepancies
  - No default anesthesia resource request
  - Outpatient appropriately scheduled
  - Inpatients hit or miss
  - Cases do not always appear on Epic snapboard for anesthesia resource allocation

- **Perioperative Tracking**
  - Inaccurate tracking systems
  - Combination of RTLS and manual entry
  - RTLS hardware outside of GI rooms
  - Fast-paced environment where manual entry is often delayed
**Pre**

- In Facility: 11:27 AM, 04/04/2022, Now
- In Pre-Procedure: 12:35 PM, 04/04/2022, Now
- Pre-Procedure Complete: 1:03 PM, 04/04/2022, Now
- Room Ready - Nursing: 

**Intra**

- In Room: 1:11 PM, 04/04/2022, Now
- Procedure Start: 1:19 PM, 04/04/2022, Now
- Procedure Closing: 
- Procedure Finish: 1:47 PM, 04/04/2022, Now
- Out of Room: 1:55 PM, 04/04/2022, Now
- PACU Request: 
- Sent to OR PACU: 

**Panel 1: Gastroenterology with Pearlman, Michelle, MD**

ESOPHAGOGASTRODUDENOSCOPY, FLEXIBLE, TRANSORAL; WITH BIOPSY, SINGLE OR MULTIPLE

**Case Tracking Information**

<table>
<thead>
<tr>
<th>Projected Start Time</th>
<th>Projected End Time</th>
<th>Estimated End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:11 PM 04/04/2022</td>
<td>1:56 PM 04/04/2022</td>
<td></td>
</tr>
</tbody>
</table>

[Options: Accept, Cancel]
Sites | Interventional Radiology

• Resource Scheduling
  • Scheduling is usually appropriate when anesthesia resources are required
  • No default anesthesia resource request; hybrid location
  • Cases usually appear on Epic snapboard for anesthesia resource allocation

• Perioperative Tracking
  • No RTLS
  • Manual Entry by procedure nurses
  • Usually delayed entry
Sites | Cath Lab

• Resource Scheduling
  • Scheduling discrepancies
  • No default anesthesia resource request; hybrid location
  • Cases do not always appear on Epic snapboard for anesthesia resource allocation

• Perioperative Tracking
  • Inaccurate tracking systems
  • Combination of RTLS and manual entry
  • Usually delayed entry
Sites | MRI

• Resource Scheduling
  • Scheduling is usually appropriate when anesthesia resources are required
  • No default anesthesia resource request; hybrid location
  • Cases usually appear on Epic snapboard for anesthesia resource allocation

• Perioperative Tracking
  • No RTLS
  • Manual Entry by procedure nurses
  • Usually delayed entry
Sites | TEE

- **Resource Scheduling**
  - Scheduling is usually appropriate when anesthesia resources are required
  - No default anesthesia resource request; hybrid location
  - Cases usually appear on Epic snapboard for anesthesia resource allocation

- **Perioperative Tracking**
  - No RTLS
  - Manual Entry by procedure nurses
  - Usually delayed entry
Sites | SCCC

• Resource Scheduling
  • Appropriate functioning of scheduling
  • In ORs, default anesthesia requests
  • Cases usually appear on Epic snapboard for anesthesia resource allocation

• Perioperative Tracking
  • No RTLS
  • Manual Entry by procedure nurses
  • Almost always delayed entry
## Sites Summary

<table>
<thead>
<tr>
<th>Location</th>
<th>Scheduling</th>
<th>Perioperative Tracking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anesthesia Default</td>
<td>Scheduling Errors</td>
</tr>
<tr>
<td>Main OR</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Amb OR</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>GI</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>IR</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>CathLab</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>MRI</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>TEE</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>SCCC</td>
<td>Y/N</td>
<td>N</td>
</tr>
</tbody>
</table>

- **Positive Attribute**
- **Negative Attribute**
- **Neutral Attribute**
Solution Proposal

• Training
  • Easiest to implement
  • Re-educate on appropriate scheduling and manual entry
  • Training can be provided by superusers within each site
  • A training module can be created in ULearn and required of all schedulers and procedural nurses for appropriate usage
Solution Proposal

• Defaults and Mandatory Fields
  • GI should have Anesthesia resources as default
  • Hybrid locations should have a mandatory field to accept or reject an anesthesia request during scheduling
  • Implementation requires IT and maybe Epic personnel
  • These changes would then have to be provided in a training module
Solution Proposal

• Automation
  • RTLS functions fairly well in the locations it exists, but not without some problems
  • Possible to re-locate the sensors (such as inside rooms)
  • Increase sensitivity of locators or upgrade hardware
  • Must convince decision-making administration to approve capital investment in upgrades or additional locators in procedural areas
  • Implementation would also involve front-end configuration with IT and Epic
Solution Proposal

• Interface Design
  • Epic Anesthesia OpTime for the intraoperative Anesthesia Information Management System has a ‘Hot’ button that can be continuously clicked very easily within a split second with each successive intraoperative anesthesia-related event.
  • This can be applied with a user interface redesign to include perioperative event ‘Hot’ buttons so procedural nurses can easily ‘click’ the button at various event times without delaying patient care.
  • Implementation would require IT and Epic support along with administrative approvals.
  • Epic is not easy to work with for user interface changes; but possible
Discussion

• Implementation would require more time and hurdles with IT and Epic personnel

• Some anecdotal change after interviews with somewhat increased incidence of appropriate scheduling of patients with anesthesia resources

• Contextual Design concepts help place interviews in context of end users
Discussion

• UI/UX is vital in any system infrastructure and will need to focus on operability by the end users
• Focus of project to improve scheduling with anesthesia resources and improve perioperative tracking via proposed UI/UX element changes
• Improve workflow; improve user experience; increase efficiency of staffing
Next Steps

**Implement proposed solutions**

- Measure incidence of scheduling errors before and after implementation
- Measure actual perioperative event tracking delays in manual entry before and after implementations
- Measure incidence of RTLS errors
- Measure anesthesia resource allocation metrics

**Investigate measurable outcomes**
THANK YOU!

Questions?