Context-Sensitive Checklists

The Problem
Checklists, when applied to individual processes in the ICU, are widely accepted in the literature as effective at improving both outcomes and adherence to best practices. Use of ICU checklists, therefore, represents an opportunity to advance reliable progress toward eliminating preventable harm to patients in the ICU. However, multiple barriers exist to the effective use of checklists in the ICU:

- Multiple checklists are simultaneously needed for prevention of multiple harms:
  - This leads to checklists that are impractically lengthy and redundant.
- Checklists do not change from patient to patient despite drastically different patient states:
  - Items on the checklist may not apply to a particular patient, or may contradict standard of care for that patient, potentially leading to inappropriate care.
- The presence of numerous irrelevant items increases cognitive load and serves as a perceptual distractor to ICU providers.

Aim/Goal
To develop a context-specific, current state checklist for each individual patient in the ICU in order to ensure completion of appropriate routine core measures required for that patient while allowing for more time for the team to critically think about non-routine care. Our goal is that the CSC will:

- Focus on core measures that have been shown to minimize adverse events in the ICU patient population.
- Be used as a tool to facilitate rounds and improve workflow by assuring that key treatments have been discussed, ordered, communicated, and completed in a timely fashion.
- Further aid in workflow by designating treatments or procedures to be addressed by a specific member of the team.
- Aid in communication both within the team and with the patient and family through interaction with MyICU.

The Team
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The Interventions
- Reviewed the literature for evidence based ICU rounds checklists
- Evaluated current use of daily rounds checklists at BIDMC
- Partnered with Aptima, an engineering firm with experience with human factors and cognitive engineering in healthcare to help inform the development of the IT platform
- Pre-intervention needs assessment of current state, user satisfaction and unmet needs
- Convened a weekly workgroup consisting of multidisciplinary clinical staff and Aptima team members to:
  - Brainstorm a future state and create a master list of all relevant/value added checklists, then selected 3 items to pilot (delirium, restraints, GI prophylaxis)
  - Conducted ongoing software development and testing at Aptima, and ongoing content development by multidisciplinary clinical group → Comment on usability, ease of workflow and clinical accuracy and applicability

The Results/Progress to Date
The current version of the CSC platform is set to enter usability testing before a pilot in the ICUs and has the following features:

- A sortable central dashboard that enables the end end-user to: sort patients by: geographic location or team, severity markers such as ventilation or delirium, or other conditions such as DNR or called out.
- For each individual patient there exists:
  - Context aware checklists for assessing and treating delirium, reassessing restraints, and administering appropriate GI prophylaxis
    - Pull real time data from EMR and combine with clinical data to suggest appropriate intervention and provide decision support in real time
  - The ability to generate a list of patient care items during generation of the care plan and to assign each task to individual providers and track its completion
    - The ability to click to push individual items of the plan to MyICU for access by patients and families along with supplemental standardized explanations for tests and procedures

Lessons Learned
- Frontline staff involvement is essential in creating a tool that does not hinder current workflow
- Building a development team from across disciplines improves likelihood of buy-in from all stakeholders and increases the utility of the final application across disciplines
- Harnessing the abundant data in our many different systems is difficult and requires careful consideration

Next Steps/What Should Happen Next
- Usability testing: optimize the utility/ ease of use of the CSC application (Feb 2015)
- Pilot version in the ICUs in early Spring 2015
- Build, test and optimize software for remaining identified critical checklists
- End-user education /training and support during pilot and roll-out

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