Enhancing Patient Safety Practices in Operating Rooms: A Proactive Risk Assessment Framework for Quality of Care Advancement

Project for the Probationary Faculty Support Program
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Introduction

Main Root Causes of Operating Rooms Issues

Analyzed Issues: Wrong Site, Side & Patient Surgery and Wrong Procedure

The main root causes of the above-stated patient-related issues are:

• Communication failures (Faltz, Morley, Flink, and Dameron, 2008)
• Inadequately designed procedures/systems (Faltz et al., 2008)
• Noncompliance with existing procedures (Faltz et al., 2008)
• Light intensity and temperature (Osorno, 2016)
• Lack of, or inadequate “time-out” (Faltz et al., 2008), as the name shows, “time-out” is the last step before starting the surgery, which represents the final reassurance of accurate patient identity, surgical site and planned procedure.
• Inadequate orientation and training (Faltz et al., 2008)
• Team issues: informal norms, hierarchy problems (Faltz et al., 2008)
• The challenge with people feeling free to speak up (Osorno, 2016)
• Lack of consistency in surgery team members (Osorno, 2016)
• Lack of clarity in roles and responsibilities (Osorno, 2016)
• Inaccurate/incomplete scheduling information (Faltz et al., 2008)
• Lack of scheduling to a procedure code, based on the specialty of surgeries (Osorno, 2016)
• Changes to the schedule until the beginning of surgery (Osorno, 2016)
• Lag time between the decision to do a surgery and the actual surgery (Osorno, 2016)
• Operational delay (Osorno, 2016)
• Production/time pressures, including case urgency (Faltz et al., 2008)
• Consent—availability, legibility, accuracy and consistency with other documents (Faltz et al., 2008)
• Inadequate patient identification and assessment (Faltz et al., 2008)
• Inadequate pre-operative/pre-procedural verification process (Faltz et al., 2008)
• Incomplete physical history (Faltz et al., 2008)
• Failure to have complete information available (in lay, lab, or pathology reports) (Faltz et al., 2008)
• Failure to correlate available information (Faltz et al., 2008)
• Inconsistent, absence of, or unclear site marking (based on standardized marking) (Faltz et al., 2008; Osorno, 2016)
• Rooms set-up, positioning, prepping and draping variation (Faltz et al., 2008)
• Lack of appropriate order of steps for the procedure (Osorno, 2016)

Methodology

Research Goal: Development of a proactive risk assessment framework to enhance patient safety in operating rooms through reducing/preventing the desired errors and adverse events.

• The foundation of the proposed methodology in this study is based on a seminal model originally developed by Rasmussen (1997). This hierarchical framework consists of six layers, with each representing a main group of involved decision-makers, players or stakeholders in a studied system (Rasmussen, 1997).
• These six layers in the context of our study, from top to bottom, are: government; regulatory; hospital; surgery division management; surgeons, nurses, anesthesiologists; operating rooms technicians and other related personnel; and work and processes in operating rooms (Fig. 1).
• To transfer the retrospective characteristics of the Rasmussen’s framework into a proactive one, we have identified appropriate leading safety indicators for each of the stated layers of Fig. 1. The role of these leading indicators in contrast with lagging indicators, is to identify sources of failure (e.g. putting patient safety at risk in the context of our project) before they occur.

Fig. 2 illustrates the process of defining the aforementioned leading safety indicators.

• In the illustrated process in Fig. 2, to define LSIs, the first step is to identify the main issues in the context of the studied system, which are patient safety-related issues in operating rooms in the scope of our project.
• The next step is determining the main contributing causes, including root causes, of the identified issues in order to be able to define related leading safety indicators based on those causes. The determined root causes are then connected to associated risk decision-makers (layers) of the Rasmussen’s risk management framework, shown in Fig. 1.
• In parallel, an extensive literature review of existing LSIs in the healthcare industry and other safety-critical industries, such as oil and gas, nuclear and power chemical processing, is conducted.
• Finally, appropriate leading safety indicators are defined to address identified root causes of issues in ORs by adjusting some of the related existing LSIs or introducing new indicators.

Major Issues in Operating Rooms

The identified major patient safety-related issues in ORs are as follows:

• Wrong site surgery [Faltz, 2001; Stempniki, 2012]
• Wrong side surgery [Faltz, 2001; Stempniki, 2012]
• Wrong patient surgery [Faltz, 2001; Stempniki, 2012]
• Wrong procedure [Faltz, 2001; Stempniki, 2012]
• Retained Foreign Object in Body (RFOB) [Faltz, 2001; Stempniki, 2012]
• Blood management (Fennell mishaps) [Laws & Goudas, 2013]
• Anesthesia management (Osorno, 2016)

Main Categories of Leading Safety Indicators (LSIs)

• Training
• Communication
• Checklists
• Process safety action items closure
• Procedures current and accurate
• Safety critical equipment inspections
• Engineering and inherently safe design
• Work
• Hazard identification and risk assessments
• Fatigue risk management
• Staffing and resource levels, turnover and overtime rates
• Pre-start up review
• Lack of resources
• Operational procedures
• Compliance with standards
• Lack of teamwork
• Responsiveness
• Safety awareness

Conclusion and Future Research

The high rate of fatalities due to preventable medical errors in the healthcare industry indicates the urgent need to improve patient safety, as a major aspect of quality of care, in this industry.

This study proposed a proactive risk assessment methodology, which is specified in the context of ORs, to fill an existing gap in this domain.

The proposed methodology integrated the risk management framework of Rasmussen (1997) and its associated layers with context-specific leading safety indicators in order to address the aforementioned issues operating rooms and their contributing root causes.

Such integration creates a proactive capability for our proposed methodology comparing to the retrospective data analysis of the stated risk management framework by Rasmussen and several other different risk analysis models in the literature.

It is noteworthy that although the introduced methodology in the study has been developed in the context of ORs, it can be generalized and applied to enhance patient safety in other healthcare settings.

There are few directions for expanding this research and its results, some of which are as follows:

• Work on developing leading safety indicators in order to expand and refine them. In addition, LSIs for other categories of patient safety-related issues in operating rooms, rather than wrong side, site and patient surgery as well as wrong procedure, and their contributing causes will be developed. For this purpose, more meetings with previously contacted subject matter experts will be held. Moreover, we plan to contact other healthcare facilities and hospitals to get more information and improve our research results.
• Develop two lines of collaboration, with researchers at the Health Sciences Department at CSUN and other universities as well as medical and healthcare settings to use as the test bed for our research. This will be the foundation for the development of a multi-disciplinary team to expand the scope of this project and prepare and submit a proposal for an external grant to two main funding agencies: 1) Center for Quality Improvement and Patient Safety, as a division of the Agency for Healthcare Research and Quality (AHRQ) and 2) Robert Wood Johnson Foundation.

References

Osorno, F. (2016). Personal communication. Executive Administrator, California State University, Northridge.

Surgical Service

Surgical Services

Invasive Procedure

Non-Surgical Procedure

Outpatient

Emergency

Upon completion of risk assessment and potential mitigation strategies, all LSIs are summarized in the LSIs implementation framework, as shown in Fig. 3. This framework includes the main and supporting LSIs to be implemented in order to improve patient safety in ORs.

Fig. 3. Proactive risk assessment framework to enhance patient safety in ORs, with case of the LSIs included

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