WHAT CAN NON-ROUTINE EVENTS (NRES) TEACH US ABOUT MANAGING RESILIENCE?

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1   SUMMARY OF THE PROPOSAL

Introduction: Non-routine events (NREs) are a source of potential harm to the safety of patients since NREs represent disruptions in everyday clinical activities or processes that are otherwise conducted seamlessly. NREs are defined as "any event that is perceived by care providers or skilled observers to be distracting, undesirable, unusual, or atypical" (Schraagen, 2011; Weinger & Slagle, 2002). NREs can be both positive and negative, but researchers typically focus on the negative aspect in order to examine ways to decrease the likelihood of NREs leading to a medical error. Prospectively capturing NREs provides a mechanism for examining the resilience in a system. Comprehensive NREs studies are essential to understanding NREs intrinsic ability to impact health care processes and outcomes. Understanding NREs impacts on a system and/or team can help with learning and understanding how a system adjust its functioning during expected and unexpected conditions (Hollnagel et al., 2011). Therefore, the present study prospectively examined the characteristics of NREs and their impacts on the surgical team during cardiac surgery.

Method: This was a post-hoc analysis of a prospectively collected dataset obtained through direct, targeted observations using an electronic data collection tool (Blocker et al., 2010). The electronic data collection tool captured the description of the NREs, the surgical phase that the NREs occurred, the potential and/or actual impact of the NREs, and the surgical team members involved in the NREs. The observation team collected data over a 6 month period in multiple operating rooms within two midwestern hospitals and across multiple surgical teams. Convenience sampling was used to select the hospitals and the cardiac surgical cases to observe (Malterud, 2001). Descriptive statistics were primarily used to analyze the characteristics of NREs during the cardiac surgical procedures. As implied for this particular research study, the dependent variable is the NREs and the independent variables are cardiac surgical procedures at the two nonprofit academic hospitals.

Results: Across all 36 observed cardiac surgical cases, on average there were 56.55 non-routine events per case (SD = 29.262; range: 14 –122). The majority of the non-routine events were environment related (52.55%) followed by technology related non-routine events (13.51%). Non-routine events occurred during all the surgical phases, but most frequently in surgical repair (30.35%), opening (23.77%) and induction (15.62%). A large portion of the non-routine events involved the nurse and surgeon (43.86%). However, the non-routine events typically were considered as having a momentary distractions impact, meaning that there was a brief pause in the flow of the operation that lasted more than 10 seconds. There were no significant differences in NREs frequency, type and impact between the two hospitals.

Discussion: Capturing NREs and examining the characteristics of NREs can provide us with a mechanism for examining our ability to respond to events and to learn from past failures and success, which are important cornerstone of resilience engineering (Hollnagel et al., 2011). The results provides us with knowledge for creating resilience in a system. The characteristics of NREs captured in this study helps us with learning (knowing what has happened), responding (knowing what to do), monitoring (knowing what to look for) and anticipating (knowing what to expect). The results suggest that NREs impacts the surgical team function and knowing how to respond, anticipate and monitor them is critical in reducing distraction-induced errors.

2   RELEVANCE FOR SYMPOSIUM

This research abstract is of great relevance to the Resilience Engineering Association Symposium 2015 Theme, because it provides results from a prospective study that examined the characteristics of non-routine events impacts on cardiac surgery care. This study highlights a researcher's ability to understand how a system adjusts its functioning during expected and unexpected conditions. This study results is essential to the cornerstones of resilience. The study demonstrates how clinicians are adaptable and proactive in an unpredictable system.

3   SIGNIFICANCE/TAKEAWAY:

The proposal advances our ability to create and sustain resilience by giving us a methodology for learning, responding, monitoring and anticipating disruptions in the system. More specifically, this study provides us with new knowledge that can be used in cardiac surgery to manage resilience and/or bring about resilience in cardiac surgical care and/or in any health domain.

4   REFERENCES

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