Improving Patient Safety With the Use of Surgical Checklists

Harry C. Sax, MD

“In flying I have learned that carelessness and overconfidence are usually far more dangerous than deliberately accepted risks.”

– Wilbur Wright in a letter to his father, September 1900

“Josie’s death was not the fault of one doctor, or one nurse, or one misplaced decimal point; it was the result of a total breakdown in the system.”

– Sorelle King, mother of 18 month old Josie King, who died at Johns Hopkins Hospital from medical error while recovering from burns.

Patient safety has come to the forefront as a major issue in medical care today. Since the Institute of Medicine’s report, “To Err is Human,” suggested that there were 100,000 deaths annually from medical error, physicians, nurses, and hospital organizations have worked to improve patient safety. Medicine requires the integration of motivated, intelligent practitioners with highly complex, technical systems. A similar analogy exists within aviation. During the early days of flight, accidents were common and blame was placed on failure of the machine. Technical improvement ensued, yet accidents continued. Eventually researchers and practitioners recognized the role of human factors: the inherent fallibility of human memory may contribute to preventable mistakes. Checklists in aviation and other high risk fields were developed, allowing an organized review of specific items necessary for the safe completion of a task. These checklists follow a flow that took into account the switches, gauges and steps involved. Medicine is less organized and standardized. The “art” of patient care has allowed high variability, and with it, increased risk for error. Beginning in the late 1990s, medicine recognized analogies between aviation and medical interventions, especially in high technology, high risk areas such as surgery and obstetrics. Process improvement ensued with an emphasis on standardization. Checklists that have been modeled after those used in aviation and other high risk industries were introduced into the medical field in the early part of this decade. An example, used at The Miriam Hospital, is seen in Figure 1. In recognition of the importance of all team members, their names are listed along the left side of the board, and introductions are encouraged. The checklist itself is designed with sliders beginning with everything in the red; as each task is completed the slider is moved to green. The “killer items” of antibiotics, DVT prophylaxis and beta blockade are included as a group, as is the identification of equipment that may be required for the procedure to be carried out successfully. When initially introduced, despite education, there was resistance: this was viewed as an additional delay to starting surgery. The administration supported the checklist, however, and nurses were instructed not to hand the knife up until the checklist was completed. This, combined with the surgeon’s realization that significant errors were caught, led to universal utilization. (Figure 2) Checklists will be important tools from an economic sense because CMS Pay for Performance will focus on process improvement including timing and type of antibiotics.

Checklists can also reduce morbidity and mortality and do not need to be overly complex. The World Health Organization’s checklist (Figure 3) emphasizes briefings as well as antibiotic utilization. The study was carried out in 8 countries and mortality fell from 1.5% to 0.8%. Serious complications fell from 11% to 7%.

Checklists are only effective when used appropriately and consistently.
Despite the utilization of the checklists at The Miriam Hospital beginning in 2005, a wrong side surgery occurred in 2008. (http://www.ri.gov/press/view/8239) Multiple root cause analyses emphasized the importance of consistent instruction in scripting to eliminate ambiguity in the interpretation of the steps. In this specific case, providers interpreted step “Site and Side Verified” variably. Based on this, the checklist has been modified to include “Can everyone see the mark?” Specific scripting, monitoring and read-back are now integrated; and awareness, including reporting near-misses, has increased. In addition, the Hospital Association of Rhode Island in consort with the Department of Health has created a Universal Protocols Work Group to develop consistent site and side marking and time-out procedures. Yet there will always be situations where consistent marking cannot be achieved, as brought to light by the recent intraoral wrong side surgery at Rhode Island Hospital.

Checklists are only effective when used appropriately and consistently. They should be modified in response to near-misses, especially when a systemic latent error is recognized. All participants must receive instruction on checklist use, including active communication, primary source verification, and feedback. Standardization of protocols has and will save lives. Although the checklist is an important component in creating an overall medical environment that encourages communication and patient safety, staff understanding and buy-in are key to success.

References
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Harry C. Sax, MD, is Surgeon-in-Chief, The Miriam Hospital, and Professor of Surgery, The Warren Alpert Medical School of Brown University.

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Correspondence
Harry C. Sax, MD
The Miriam Hospital
164 Summit Avenue
Providence, RI 02906
Phone: (419) 793-4548
e-mail: hsax@lifespan.org