Chapter 16
Perioperative Process Improvement

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Imperative for Change: Efficiency and Safety

Data collection and analysis is the cornerstone and first step toward process improvement. Through integration of multisource data and delivery of processed data to multiple users in a real-time, near real-time, or periodic fashion, an AIMS has several distinct advantages over traditional paper-based record-keeping systems. For example, data collection can be handled in a manual process in which codification occurs by the user at the time of entry, or in an automated fashion in which data are collected and codified by the electronic system without user intervention. Improving the accuracy and completeness of data collection produces improvements in the quality and quantity of data available for subsequent analysis. Improvements have been shown in detection of adverse events, in which the rates of reporting are notoriously low when the data are self-reported. Data processing can also be immediate, yielding potentially important on-the-fly decision-support information. These data can then be relayed to clinicians in the field via alphanumeric pagers, wall-mounted computer displays, or handheld computers. Alternately, data can be queued for offline multiphase review and analysis. Reports can be produced in a standardized format through monthly reports delivered to decision makers, or they can be produced via database queries or on-demand data aggregation at the level of granularity that is required.

Efficiency gains result in multiple benefits to the perioperative suite. Revenue is improved through increased charge capture, better schedule management, and more efficient patient flow. Patient satisfaction and expectations are more successfully met through decreased delays and case cancellations due to better management of patient disease-related issues, better scheduling of manpower and OR facilities, and a decreased need for the patient to endlessly repeat the same medical and demographic information to multiple staff members. These same efficiency gains can also decrease staff frustration with the inefficiencies so common to the OR, such as those related to room turnover, instrument availability, staff availability, and even patient availability.

It is important to remember that beyond efficiency and satisfaction, the paramount goal of process improvement is to achieve the highest levels of patient safety.
possible. Although safety has always been a goal of the medical community, the Institute of Medicine focused national attention on this issue in the year 2000 with the release of the landmark report *To Err is Human: Building a Safer Health System*, which recommends such action items as the creation of tools, protocols, and research to enhance the knowledge base of patient safety. Additionally, developing both mandatory- and voluntary-reporting systems to encourage quality improvement was recommended. Later, a second Institute of Medicine report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, designated six aims for an optimal healthcare system: safe, effective, patient-centered, timely, efficient, and equitable. The report noted that information technology has enormous potential for transforming healthcare and presented specific suggestions (e.g., automated order-entry systems, automated reminder systems, clinical decision-support systems, and alignment of financial incentives for both patients and practitioners with quality improvement) as potential methods for using electronic information systems to provide a substantial improvement in healthcare quality. Additionally, other groups such as the Leapfrog group, Institute for Safe Medication Practices, and The Joint Commission are encouraging the use of electronic systems to improve efficiency of patient care, cost effectiveness, and safety.

**Data Analysis**

In a traditional perioperative suite that lacks an AIMS, paper-based data collection or chart abstraction presents multiple impediments to a process-improvement program. Every clinician has experience with paper-based records that are often incomplete or missing. Even when available, they frequently must be physically obtained from a distant medical records repository for analysis. While the paper records are out for analysis by one group, they are unavailable for use by anyone else for either clinical or administrative purposes, unless they are photocopied. The security and the integrity of the medical records are also at risk while they are out for analysis, as it is entirely possible for the records to be lost, stolen, inadvertently misplaced, or discovered by nonauthorized staff or visitors. Additionally, it is relatively easy for a paper-based medical record to be altered without discovery or audit capability of who made the changes and at what time.

EMRs support data discovery. Manual review or chart abstraction is a very labor-intensive process. It is not uncommon, therefore, to dedicate a large portion of a project’s effort toward gleaning and coding data from paper charts. Also, due to the amount of labor involved in manual extraction, it is common to only survey a sample percentage of charts and extrapolate those data to the entire chart population or to base statistics on a much smaller sample size, with resulting decreases in statistical power. Lastly, the manual chart extraction process is quite inflexible. For example, if after the review of 100 charts, it is found that an additional data field is required to complete a study, it is necessary to re-review all of those charts to gain access to that one additional data field. In contrast, review of electronic data allows...