The financial epicenter of most hospitals, perioperative services, drives some 60% of revenue and 35% to 40% of costs. With such a high level of economic impact, perioperative services, led by anesthesiologists, are critical to driving a high-quality, efficient, and profitable organization. Today, many organizations and anesthesiologists still utilize paper charts or a panoply of non-integrated systems in the perioperative suite. An Anesthesia Information Management System (AIMS) that has been designed to support the entire Perioperative workflow from Pre-op through PACU and beyond into ancillary areas can be a powerful, yet often underutilized, solution in the perioperative area. Historically, many have viewed an AIMS as simply the electronic anesthesia record which allows for the collection and storage of anesthesia data in the operating room. Increasingly, hospital administrators are realizing that these systems offer heightened levels of financial, clinical, and administrative performance for the hospital as well as for anesthesiologists and other members of the perioperative care team.

**AIMS BENEFITS**

**HOSPITAL REVENUE AND COSTS**
- Helps improve revenue cycle efficiencies and coding efforts\(^3, 4, 5\)
- Reduces anesthesia-related drug costs\(^6\)

**SUPPORT OF PATIENT CARE**
- Supports patient care\(^7\)
- Improves the data quality of the intraoperative anesthesia record\(^8, 9\)
- Enhances clinical studies\(^10\)

**SUPPORT OF CLINICIANS**
- Supports training and education of the anesthesia workforce\(^11\)
- Helps clinicians to make more informed decisions\(^12\)
“We were able to raise on-time first case starts by 16% (from an average of 72% to 88%) if a patient underwent a pre-operative anesthetic evaluation where the information was captured using Centricity Perioperative Anesthesia.”

J.L. Epps, M.D.
Chairman of the Department of Anesthesiology
University of Tennessee Medical Center in Knoxville

Anesthesia Information Management Systems: Market Adoption
Although AIMS systems have demonstrated significant benefits, recent studies indicate that AIMS adoption has yet to reach critical mass in the perioperative world. One study found that about 25% of organizations had installed an AIMS, some 15% were in the process of installing an AIMS, and another 15% were evaluating systems for purchase. These statistics reveal that upwards of 60% of the market operates without an AIMS. A 2012 KLAS study confirms this low adoption rate, finding that nationally only 300 organizations had deployed an AIMS. Contrary to this low level of adoption are the recognized benefits of AIMS. AIMS adopters overwhelmingly (79%) cited that AIMS provide more accurate clinical documentation, and other studies have demonstrated AIMS value across both financial and administrative spheres. Some of the obstacles to broadening AIMS adoptions are common and include the need for additional technology support and their connectivity with Electronic Medical Record (EMR) systems. While these are legitimate concerns, adopters who are now using AIMS state that the connectivity and implementation of the right systems generate substantial benefits that well outweigh the financial and time investments required to purchase and implement the system without creating undue burden on the organization.

Kevin Wethington, M.D. and Associate Professor of Anesthesiology at the University of Utah School of Medicine, has a valuable perspective on AIMS adoption. A practicing anesthesiologist, he is also deeply ingrained in the administrative and financial aspects of his organization as the Vice Chairman for Billing and Finance. He stated that anesthesiologists “are among the last to get attention for these kinds of solutions, and many even wondered why we would want an electronic system. Having seen the benefits of GE’s AIMS, I cannot imagine not having this system. We have been able to optimize care to a new level. Prior to our AIMS we estimate we were providing prophylactic antibiotics 85% of the time. With the help of CPA, we have achieved 100% compliance with this measure.”

AIMS as Integrator of All Perioperative Phases of Care
Throughout every phase of the surgical experience, anesthesiologists play a central role in providing perioperative medical care. A variety of workflows from the preoperative to post-operative environment, as well as multiple ancillary areas, generate a significant amount of data. Capturing this important data and creating actionable information optimizes patient care, drives efficiencies, and improves team communication. An AIMS that has been designed to support the entire perioperative workflow can connect disparate sources of electronic patient information, making it available before, during, and after surgery. Because AIMS ably manage critical data elements, the Anesthesia Patient Safety Foundation advocates and endorses their use.

Reducing PAT Workload
In some cases an AIMS system has not only helped improve the on-time start rate, but it has also helped reduce the number of providers needed to run the Pre-admission Testing (PAT) Clinic. According to J.L. Epps, M.D. and Chairman of the Department of Anesthesiology at UTMCK, staffing for pre-operative needs is usually achieved with nurse practitioners and physician assistants supervised by anesthesiologists. At UTMCK, the “PAT clinic is staffed by nurses with an anesthesiology resident on-site who serves as a consultant and who reviews laboratory and other evaluation tests such as cardiac catheterization data.” Dr. Epps stated that this staffing configuration is possible “because the GE AIMS system provides user-friendly tools that allow users to manage the patients. We have even been able to seamlessly orient new staff, manage the transitions between shifts, and reduce the number of personnel required for PAT.”

AIMS and On-Time Surgery Starts
Delaying surgeries due to lack of information is costly to the anesthesiologist, the surgeon, and the hospital. Breakdowns in information flow can sub-optimize patient care and have financial implications. On-time first case starts occur about 64% of the time, with subsequent on-time starts occurring about 53.5% of the time (with cancellation costs estimated at $4,550 per case in an Academic Medical Center and $6,000 per day of cancelled surgeries at an Integrated Delivery Network in the Pacific Northwest). On the other hand, an AIMS can help to improve on-time case starts. A January 2013 study from the Journal of Pediatric Surgery found that process management improvements and health information technology deployment increased on-time starts four-fold and the number of operative cases by 35%. These changes were associated with a 53% increase in operating revenue. The improvements demonstrated in these studies are mirrored by the University of Tennessee Medical Center in Knoxville (UTMCK) which raised on-time first-case starts by 16% (from 56% to 72%) through anesthesia information captured in the pre-operative area using GE Healthcare’s AIMS, Centricity Perioperative Anesthesia.

AIMS and Quality in the Operating Room
Data capture in the pre-surgical areas serves more than just as an efficiency to perioperative patient flow and staffing. With the aid of an AIMS system, the patient’s data can be streamed directly into an anesthesia clinician summary view giving the clinician the ability to see relevant data needed to prepare a case. Templates and checklists help to ensure that the team follows protocols for conditions such as malignant hypothermia or anaphylaxis. When crisis conditions such as these arise, the built-in decision support tools help ensure fidelity to evidenced-based medical guidelines with accurate documentation. Dr. Epps notes that “standardization of care enhances patient care. By having checklists built into Centricity Perioperative Anesthesia, providers of all levels and roles in the perioperative setting can work together to optimize patient care during critical events.”

In addition, AIMS can enable anesthesiologists to compare population health outcomes. According to Dr. Epps, “The most important value of an AIMS is the ability to capture data and report outcomes. CPA allows data to be transmitted to the Anesthesiology Quality Institute where comparisons to national benchmarks can be made. In this way, anesthesiologists are continually in a position to enhance quality by better measuring the parameters and outcomes of every case.”
**AIMS and PACU: Enabling Patient Throughput**

In the PACU, Centricity Perioperative Anesthesia has also helped UTMCK to institute a “fast-track” system that allows medically appropriate patients to bypass the recovery room after surgery. Prior to surgery the anesthesiologist determines if the patient qualifies for “fast track eligibility.” Before the patient leaves the operating room, the provider in the operating room reviews and scores the fast-track criteria again, allowing qualified patients to bypass recovery. Fast tracking alleviates recovery room congestion, minimizes the labor burden, and increases patient satisfaction. UTMCK has found roughly half of its patients eligible for fast tracking. Scoring and patient monitoring are built into the GE Healthcare’s AIMS resulting in numerous benefits. Dr. Epps notes that “from a patient care perspective, PACU space and nursing are a critical resource. Our hospital recovery room, like most others, runs at near capacity. A back-up in recovery rooms challenges our entire operating room schedule. Fast tracking has been a real operational benefit to our efficiency.”

**Beyond Perioperative: AIMS in Ancillary Areas**

An increasing trend in anesthesia delivery is in the administration of anesthesia outside of the perioperative suite. At UTMCK, Centricity Perioperative Anesthesia has been setup for labor and delivery tracking to enable anesthesiologists to accurately monitor epidural administration. The use of AIMS to support anesthesia documentation in ancillary areas outside the perioperative suite clearly demonstrates how a well-designed AIMS goes beyond being just a documentation tool for anesthesia data inside the operating room.

**For Hospital Administrators: Choosing an AIMS**

For a hospital administrator the decision to implement a system that can help improve revenue cycle efficiencies and coding efforts, reduce anesthesia-related drug costs, and help clinicians make more informed decisions while supporting patient care may seem obvious. Unlike other solutions or technologies hitting the market, AIMS is not a newcomer. It has a long track record of success and a demonstrated substantial return on investment in the perioperative suite. But choosing the right AIMS system to enable these benefits may not be as easy. An AIMS that has been designed to support the entire perioperative workflow from pre-op through PACU and beyond into ancillary areas is one that is worth consideration. Because the anesthesia clinician leads the workflow that supports more than half of a hospital’s revenue, having a system that directly helps anesthesia clinicians to be an integral part of your perioperative care team is the best choice.

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<thead>
<tr>
<th>Pre-Op</th>
<th>Intra-Op</th>
<th>Post-Op</th>
<th>Outside Periop</th>
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<tbody>
<tr>
<td>Help reduce the number of providers needed to run the Pre-admission Testing (PAT) Clinic</td>
<td>Help increase on-time case starts by capturing key anesthesia information &amp; patient history electronically</td>
<td>Help institute a “fast-track” system to have medically appropriate patient bypass PACU after surgery</td>
<td>Anesthesia is increasingly being delivered outside of Periop, and a properly designed AIMS can help this workflow challenge</td>
</tr>
<tr>
<td>One customer’s experience: CPA has helped to seamlessly orient new staff and reduce the workload required to run the PAT</td>
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About GE Healthcare
GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

Our “healthymagination” vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access and improving quality around the world. Headquartered in the United Kingdom, GE Healthcare is a unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employees are committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at www.gehealthcare.com.au

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