

OPERATING ROOM EFFICIENCY 2023 RESEARCH REPORT

Survey reveals link between efficiency and clinical outcomes but manual processes, inaccurate physician preference cards, and lack of actionable data remain a drain on operating room resources

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EXECUTIVE SUMMARY

The operating room (OR) is the core of a hospital's lifesaving and life-changing procedures. Reimbursement rates for perioperative services are a primary contributor to financial margins, but this is balanced by the fact that expenditures in the OR are some of the highest for a hospital, most notably labor and supply costs.

For this reason, OR procedures performed with efficacy and efficiency stand to generate the highest quality patient outcomes at the lowest costs, which is the aim of value-based care and payments.

A new survey of perioperative leaders offers quantitative insights into how efficiency in an OR correlates to patient outcomes, drilling down into specific factors that generate unnecessary labor, costs and waste.

ABOUT THE SURVEY

The 2023 Owens & Minor OR Efficiency Research Report presents a sampling of perioperative leaders' perceptions of OR efficiency, clinical outcomes, technology adoption and data usage.

The results are based on a survey conducted by the Association of periOperative Registered Nurses (AORN), commissioned by Owens & Minor. The goal was to gain insights into the current state of OR efficiency, and factors that may improve or reduce it.

The online survey of perioperative managers and directors (hereafter referred to as "leaders") was conducted at the end of 2022. This report is the result of those findings.

A total of 250 perioperative leaders completed the survey. Among the respondents, 72 work for academic medical centers and 178 acute care hospitals. There was no significant difference in responses based on institutional category.

The majority of respondents have 10 or more years of experience in the OR (82%).



INTRODUCTION

Last year was the worst financial year for U.S. hospitals and health systems since the COVID-19 pandemic began. Approximately half of hospitals ended 2022 with negative margins as higher expenses outpaced revenue increases.

The main revenue driver for hospitals, ORs, have been hit hard by the pandemic and healthcare leaders are searching for ways to make up for the significant financial losses they have incurred from procedural volume disruptions.

At the same time, hospitals face increased competition for profitable orthopedic procedures from ambulatory surgery centers (ASC) that can often perform these cases at a lower cost.¹

Compounding these challenges are rising clinical labor costs, staff shortages and growing supply expenses.

In today's value-based payment environment, hospitals can't simply charge more for their services to improve margins and get back in the black. Payer reimbursements increase only when renegotiated, in some cases remaining stagnant year-over-year, or in the worst-case scenario are cut.

To enable their hospitals to survive and thrive, perioperative leaders must find ways to deliver

services with greater efficiency, streamlining nonclinical tasks for their team members so they can increase the volume of high-quality, cost-effective procedures.

While hospitals inherently understand the factors that contribute to OR efficiency (e.g., process automation, supply availability, physician preference card accuracy) there has not been much quantitative research published on this topic in recent years.

To gain a greater understanding of efficiency within the OR suite, Owens & Minor (O&M) commissioned the Association of periOperative Registered Nurses (AORN) to conduct a survey of perioperative leaders among its membership.

This O&M OR Efficiency Report presents the findings, including challenges facing perioperative teams today, efficiency drivers and detractors, impacts on clinical and financial outcomes, and five ways to leverage this information for actionable improvements.

This report also includes commentary from perioperative leaders who completed the survey, along with commentary from participants from two previous qualitative research projects Owens & Minor conducted on different aspects of the OR in 2021 and 2022.



¹ Wang KY, Puvanesarajah V, Marrache M, Ficke JR, Levy JF, Jain A. Ambulatory Surgery Centers Versus Hospital Outpatient Departments for Orthopaedic Surgeries. J Am Acad Orthop Surg. 2022 Mar 1;30(5):207-214. doi: 10.5435/ JAAOS-D-21-00739. PMID: 35143432.

SECTION ONE: KEYRESEARCH FINDINGS

STAFFING AND SUPPLY ISSUES FUEL HIGH STRESS LEVELS

At a time when reimbursement rates are remaining flat or even declining, hospitals are spending more. Supply and labor expenses have skyrocketed and are expected to keep rising.

Recognizing the labor shortage facing many ORs, we asked perioperative leaders about the level of stress in their current working environment. Over half (59%) rated it as "stressful" or "extremely stressful," with more than three-quarters of respondents (77%) reporting that their workloads have grown "more" or "a lot more" since the pandemic began.

Labor is a major pain point, with nearly three out of five respondents (59%) citing staffing shortages as a substantial issue for their ORs.

Maximizing supply usage is key to cutting unnecessary costs and waste. As cited in a recent study, ORs "generate 70% of hospital waste, leading to increased costs for the hospital, patient and the environment."¹

When asked about specific challenges in their ORs, 62% rated supply related factors as "very" or "extremely" problematic. Supply challenges include supplies not stocked and readily available for a procedure (30%), documenting products used during a procedure (20%), and products expiring before being used (12%).

In a follow-up question about the supply chain, 94% rated supply chain optimization as "very important" or "extremely important" to the optimization of their OR, with the majority of those surveyed (54%) rating it as "extremely important."

¹Heiman AJ, Camargo L, Bhat D, Desai V, Patel A, Ricci JA. Curtailing Unnecessary Waste Among Operating Room Personnel: Evaluating the Cost Awareness of Commonly Used Surgical Items. Am Surg. 2022 Jun;88(6):1263-1268. doi: 10.1177/0003134821995079. Epub 2021 Feb 17. PMID: 33596104.



KEY FINDING:

Over three-quarters of perioperative leaders say workload has increased since the pandemic began



KEY FINDING:

Vast majority of ORs prioritize supply chain optimization

"The connection here is talking about how we're going to have to manage all of our other costs so closely to be able to afford the staffing labor cost increases."

- Administrator of Perioperative Services



CLINICAL OUTCOMES HIGH, EFFICIENCY LAGS BEHIND

The survey measured OR efficiency in terms of respondents' self-reported answers regarding

four key performance indicators (KPIs):



Among perioperative leaders who rated their OR efficiency as "high" or "very high," 95% also rated their clinical outcomes as "high" or "very high," indicating that **OR efficiency is associated with better clinical outcomes.**

Most respondents rated their clinical outcomes as higher than their efficiency, with 79% of those surveyed rating outcomes as "high" or "very high" and only 32% rating efficiency as "high" or "very high."

Looking at all the efficiency ratings, the most common was "somewhat high" by a plurality (39%) of the respondents.



"...if you think about a gunshot wound coming into the OR, that's a very critical patient and it's very important that you're efficient and that you're taking care of the patient as quickly as possible. Minutes can save lives. Seconds can save lives."

- Former Perioperative Executive





*Perioperative leaders were questioned on the efficiency of what occurs within their individual operating rooms (e.g., procedural efficiency), as opposed to the efficiency of their overall departments (e.g., procedural efficiency plus efficiency of supply chain, sterile processing,

TECHNOLOGY SOLUTIONS DRIVE EFFICIENCY, BUT LACK OF INTEGRATION, MANUAL PROCESSES DETRACT

The survey respondents were asked about their use of technology solutions for managing various aspects of the OR as opposed to manual, paper-based processes. These findings were correlated with the four OR efficiency KPIs (on-time starts; starts within the target turnover time; percentage of OR utilization; case pick accuracy).

The data revealed a general trend of higher OR utilization with higher levels of digital supply chain processes. In ORs where supply chain activities are 100% digital, the average utilization is 71%.

ORs have made tremendous strides in transitioning from manual** to technology-driven processes. Across all OR processes, 60%, on average, are handled within IT solutions according to the survey findings. Surgery scheduling is reported to be the most technology-enabled process, with 75% of tasks handled digitally.

While ORs have implemented technology solutions to help drive efficiency across many of their processes, they still handle 40% of them with manual intervention, specifically those related to supply management. Managing periodic automatic replacement (PAR) levels is the least technology enabled process, with 47% of tasks still requiring manual intervention, closely followed by inventory tracking at 46%.



KEY FINDING:

OR utilization higher among those with digital processes

KEY FINDING:

Tech adoption grows yet many supply chain processes still handled manually

"My goal is the margin mission... The surgery creates the margin for everything else in our health system... My goal, my task is to create that margin that we can then drive everything else."

- Administrator of Perioperative Services





^{**&}quot;Manual" and "manual intervention" refer to processes where an individual must manually intervene and perform additional steps to accomplish a task, as opposed to technology-enabled processes tasks are largely automated (e.g., scanning a product's barcode to capture data within a system as opposed to keying the product data into a system or documenting it in writing on paper).

Only 21% of perioperative leaders surveyed say they use barcode scanning to document materials used in a procedure, while 70% report using some sort of manual data entry. The remaining 9% reported using other methodologies.

One issue that rose to the surface in this survey is widespread lack of IT system integration.

Among the perioperative leaders surveyed, 49% said their solutions across electronic health records/electronic medical records (EHR/ EMR), inventory tracking, materials management, billing and patient identification are "not integrated" or only "somewhat integrated."

The survey also revealed that higher system integration correlates to higher levels of technology solution utilization. For example, facilities where fewer than 60% of their processes are technology-enabled reported only 30% of their solutions as "integrated" or "very integrated." Among those with a 60% or higher level of technology-enabled processes, 53% rated their level of integration as "integrated" or "very integrated."

When correlating metrics on technology solution integration with OR efficiency KPIs, ORs with a high level of system integration have a higher OR utilization rate (71%) compared with those that have no integration (57%).

20%

perioperative leaders surveyed say they use barcode scanning to document materials



KEY FINDING:

Nearly half of perioperative leaders cite lack of system integration as a challenge

71%

ORs with a high level of system integration have a higher OR utilization rate



PHYSICIAN PREFERENCE CARD INACCURACY DRIVER OF INEFFICIENCY AND WASTE

Physician preference cards drive multiple downstream processes that are critical to an OR's clinical, operational and financial performance, from inventory management and accurate picking of items for a case, through to supply documentation, charge capture billing and reimbursement.

The process of picking supplies for a case based on a physician's preference card can be time consuming and labor intensive, especially in instances when a high percentage of items picked go unused and must be returned to inventory. If single-use sterile items are opened in the OR but are not used on the patient they must be thrown away, resulting in unnecessary waste and added costs.

When asked for the main reasons why supplies are picked for a case but not used, the top response was physician card inaccuracy at 40%. Only 7% of survey respondents report that their cards are more than 90% accurate.

The findings also indicate that as the accuracy of preference cards increases, there is a steady increase in picked items being used, thus reducing this source of waste. For example, those perioperative leaders who rated their preference card accuracy between 91-100% also reported an 89% rate of picked item usage.

Another source of waste in the OR is when products expire before being used, with the approximate average percentage of expiredproduct waste at 13% (more on this topic in Section 2 of this report).



7%

KEY FINDING:

Inaccurate preference cards most common reason for unused supplies

Only 7% report over 90% pref card accuracy



Strong link between accurate pref cards and rate of picked item usage



Regularly updated and accurate physician preference cards may be one key to reducing waste in the OR. When asked how often they update preference cards, 26% selected "once a week," 14% "once a quarter," 6% "twice a year," and 7% "once a year." Nearly half (44%) selected "other" and the remaining 2% chose "never."

To understand the high percentage of perioperative leaders selecting "other," we examined their written responses. Most of these respondents said they make changes "as needed," such as when a new surgeon joins the staff or when a current surgeon asks for a change, as opposed to proactive improvements. A few of the written responses implied that updates weren't made until someone had the time to do it.

With regards to the modality for preference card updates, the top selection (48%) was an OR nurse relaying changes to the person who enters and manages changes in a technology solution. Among those using this process, 28% say they are satisfied and 63% say it is easy to use.

About one in four perioperative leaders (23%) report using a manual process where nurses write changes on paper preference cards. This preference card management methodology correlated to the lowest levels of satisfaction (18%) and ease of use (49%).

While ease of preference card management (81%) and card satisfaction (44%) are highest when an OR nurse can make preference card changes directly in technology solution, only 17% of respondents say they have this capability.

Regarding preference card accuracy, there is little difference when someone other than the OR nurse performs the changes in technology solution (72%) compared to when the nurse enters it directly into the solution (70%). Those with manual, paper-based card management reported the lowest accuracy rates (64%).



KEY FINDING:

Preference card updates mainly reactive, little proactive management reported



KEY FINDING:

Digital preference card updates preferred; higher accuracy and ease of use



one in four perioperative leaders report using a manual process where nurses write changes on paper preference cards



ORS HAVE DATA ACCESS BUT WHAT THEY NEED ARE ACTIONABLE INSIGHTS

The survey queried perioperative leaders on their use of data to improve process efficiency related to the four KPIs studied (ontime starts; starts within the target turnover time; percentage of OR utilization; case pick accuracy).

The research found a statistically significant (p = .002) relationship between data use and the rated helpfulness of the data. This suggests that perioperative teams desire data that enables them to make smarter decisions faster.

Those who rated their data as "very helpful" or "extremely helpful" used the data about 89 times a year to take action to improve the OR, while those who rated their data as "somewhat helpful" or less used the data approximately 67 times a year.

What is more significant is the link between the helpfulness of the data used and improvements in OR efficiency KPIs, particularly OR utilization rate.

Leaders who perceive their data as "extremely helpful" have 75% OR utilization while those who perceive it as "not at all helpful" have only 49% utilization. OR utilization was 26% higher in ORs where data was perceived as "extremely helpful," as compared to ORs where data was perceived as "not at all helpful".

ORs use data most frequently for preference card changes (every two weeks on average), efficiency gains and supply management (16 times per year on average), and less often for case costing (7 times per year on average), and cost variance insights (3 times per year on average).



KEY FINDING:

Data usefulness, not frequency of use, drives OR efficiency

"The way I see it is sometimes we have a lot of data, but we don't have knowledge."

> - Administrator of Perioperative Services



SECTION TWO - LEVERAGING THIS RESEARCH FOR ACTIONABLE IMPROVEMENTS



FIVE KEY TAKEAWAYS

Five takeaways from the survey findings that can be used to guide perioperative teams forward on a path to greater efficiency, lower costs, and improved clinical outcomes.



ONE THERE IS NO BETTER TIME TO BOOST OR EFFICIENCY

Perioperative teams are burdened by increased workloads, staffing shortages and supply chain disruptions. Supply management and documentation, while high on the priority list for perioperative leaders, should not be a burden that falls on the shoulders of clinicians.

Increased use of technology solutions correlates with OR efficiency, as evidenced by an average 71% OR utilization rate among departments where supply chain activities are 100% digital.

While OR utilization was the KPI most associated with greater use of technology solutions, the survey findings suggest an opportunity for perioperative teams to leverage technology to improve OR efficiency KPIs across the board (e.g., on-time starts, starts within the target turnover time, case pick accuracy).

When a hospital makes it easier for a perioperative team to have the right products in the right places at the right times, document their usage in the patient record, and trigger replenishment to maintain appropriate inventory levels, then clinicians can focus on their priority – the patient.

This aligns with the goals of the National Library of Medicine-funded 25×5 Symposium, which has established strategies and approaches to reduce documentation burden on U.S. clinicians to 25% by 2025.4

To alleviate perioperative teams of supply management burden and boost efficiency, some hospitals have turned to a clinical supply bundling service that delivers ready-to-use custom procedure kits right to the OR based on procedure and physician preference.

Designed for complex, high volume cases, these kits provide OR Teams 80-90% of the supplies they need for a surgery in a single kit.

⁴ 25×5: Decreasing Documentation Burden on U.S. Clinicians, National Library of Medicine, August 11, 2021, <u>https://nlmdirector.nlm.nih.gov/2021/08/11/25x5-</u>decreasing-documentation-burden-on-u-s-clinicians/

71%

OR utilization rate among departments where supply chain activities are 100% digital



these kits provide OR Teams **80-90% OF THE SUPPLIES THEY NEED** for a surgery in a single kit.



TWO OR TEAMS NEED TECHNOLOGY SOLUTIONS THAT ARE EASY TO USE AND INTEGRATE WITH KEY SYSTEMS

With 94% of perioperative leaders rating supply chain optimization as "very important" or "extremely important" there is obvious recognition for the role supplies play in costs, quality and outcomes.

While there has been progress made in automating supply chain processes through technology solutions, 40% of tasks are still handled manually, most notably PAR level management and inventory tracking.

The low percentage of ORs that use barcode scanning to document supplies in their EHRs (21%) indicates that most clinicians must manually intervene to capture this data, adding time and labor to the process and increasing the risk for error.

The question becomes: Do ORs lack technology solutions or do the solutions they have in place fail to support their workflows? Are they so complex and time consuming that perioperative teams revert to manual methods?

Widespread lack of system integration, with nearly half (49%) of perioperative leaders saying their systems are "not integrated" or only "somewhat integrated" likely contributes to complexity and manual intervention.

This points to the need for supply chain solutions that seamlessly integrate with other systems (e.g., EHR, MMIS) and fit within a clinician's existing workflows for automated supply tracking and management.

An inventory management solution that integrates with the hospital's materials management information system (MMIS), EHR and financial systems with automated point of use (POU) product data capture via barcode scanning can facilitate interoperability and process automation. Having a single solution for supply tracking and documentation also provides perioperative teams with the visibility they need to manage supplies more effectively for improved utilization.



of perioperative leaders rating supply chain optimization as "very important" or "extremely important"



of perioperative leaders say their systems are "not integrated"



THREE PROACTIVE, DIGITAL PHYSICIAN PREFERENCE CARD MANAGEMENT KEY TO REDUCING COSTS AND WASTE

Keeping physician preference cards up to date is critical to reducing waste, both in staff labor and supply inventory, as evidenced by the 40% of perioperative leaders who cite card inaccuracy as the main reason why supplies are picked for a case but not used.

The fact that only 17% of ORs have a process in place where an OR nurse can make card changes directly in a technology solution (cited as the easiest and most satisfactory approach) could indicate that most perioperative teams lack an effective solution to support this process.

The research also indicates that proactive card changes are not common practice, rather OR nurses tend to make them reactively to requests or the onboarding of new surgeons. The written responses implying that updates weren't made until someone had the time to do it is quite telling in the context of the quantitative findings.

If 77% of perioperative leaders use a technology solution for preference card management, what is stopping nurses from making updates proactively and directly? While protocols around change approvals undoubtedly has an impact (e.g., the OR director needs to approve a change), the research still points to potential limitations inherent in existing solutions.

What perioperative teams need is a digital solution that continually updates physician preference cards based on what was used in the cases. For those hospitals that use a delivery service for customized surgery packs, the service provider can compare the items on a physician's preference card with supply consumption data to build more accurate kits for fewer unused items and returns and less product waste. Furthermore, this data can be used to standardize on products commonly used across physicians and procedures to reduce overall perioperative supply expenses.



perioperative leaders who cite card inaccuracy as the main reason why supplies are picked for a case but not used.



OR nurses tend to make card CHANGES REACTIVELY to requests or the onboarding of new surgeons



of perioperative leaders use a technology solution for preference card management the research still points to potential limitations inherent in existing solutions.



FOUR TO DRIVE EFFICIENCY, PERIOPERATIVE LEADERS REQUIRE ACTIONABLE INSIGHTS, MEASURABLE IMPROVEMENTS

The survey findings suggest that perioperative teams with "helpful" data use it more frequently to drive efficiency and have greater success in their initiatives. So, what makes data helpful to perioperative leaders?

The widespread use of disjointed IT systems, as evidenced by this survey, means perioperative teams must extract, compile and rationalize data points relative to their efforts, or rely on their hospital's IT team to do this work.

It is challenging to set a baseline for perioperative efficiency, establish a future goal and measure improvements with data and analytics that are days, weeks or even months old by the time the perioperative team has it in a form in which they can use it. Perioperative leaders need a solution that pushes actionable insights to them.

With regards to physician product preferences, hospitals increasingly desire the ability to demonstrate how product choices impact total case costs and reimbursement, but the survey found ORs rarely use available data to determine case cost per procedure (7 times per year on average) or compare cost variance between surgeons (3 times per year on average). This level of granularity into procedural costs has been referred to as the "holy grail" in healthcare delivery.

The move toward a more clinically integrated supply chain, as defined by the Association for Healthcare Resource and Materials Management (AHRMM), means hospitals must break through disjointed system silos and integrate supply cost, clinical outcomes and financial data (e.g., total case cost, reimbursement).



data and analytics can be

DAYS, WEEKS OR EVEN MONTHS OLD

by the time the perioperative team has it in a form in which they can use it.

"I think definitely cost of case has always been important and will become even more important. It's always the push and pull here of our clinicians, our physicians wanting lots of choice. But, in terms of efficiency and cost, that's not always the best strategy. So that's always the push and pull for physician preference items."

- Administrator of Perioperative Services





Only with accurate, meaningful and timely analytics can they transition from pure preference to evidence-based supply decisions. The research findings indicate that while perioperative leaders know what products are on their physicians' preference cards, they lack "helpful" data around supply consumption and overall costs.

Technology solutions for supply consumption tracking at the POU and physician card management that are fully integrated with legacy IT systems (e.g., EHR, MMIS) can generate actionable insights based on an OR's supply chain, clinical documentation and financial data. Complete and timely analytics reported graphically so they are easy to understand can help perioperative teams take immediate action to improve key efficiency KPIs.

A cloud-based, digital supply chain solution that leverages artificial intelligence (AI) for data analysis can provide perioperative teams with predicative analytics based on supply consumption and procedural volume trends over time. With this information at their fingertips, perioperative leaders can better match their resources (e.g., staff labor and supplies) to patient demands.



A cloud-based, digital supply chain solution can leverage **ARTIFICIAL INTELLIGENCE (AI) FOR DATA ANALYSIS** and provide OR teams

with predicative analytics based on supply consumption and procedural volume trends over time.

"Surgeons love new toys. What I'm struggling with is: That's great, that's nice, but everything is more expensive...I'm just thinking of the smoke pencil that we just got forced to change. Now it has a little button that they can turn off and on and it's more slick to be able to do that. Well, it cost me \$1.50 more. My patient never changed... So now you didn't change anything, now I can't charge the patient more for that, and so I just get to eat that cost."

- Surgery Service Line Administrator



FIVE DON'T IGNORE THE PATIENT SAFETY "ELEPHANT IN THE ROOM"

On the surface, the reported 13% of expired product waste doesn't ring alarm bells in terms of inefficiencies and costs. But in taking a step back from the number, turning it around and considering how ORs have in their inventory an average of 13% of products that expire on the shelves, the findings become more significant from a patient care and safety perspective.

What is the risk of a clinician using an expired product on a patient? Considering how perioperative supply inventory includes not only general medical/surgical supplies, but also high-cost, high-risk consignment products, such as implants and stents, and the stakes become clear.

This leads to the question:

If perioperative teams cannot track product expiry with current systems, what capabilities are they lacking and how can technology and solutions providers fill that gap?

An end-to-end, cloud-based perpetual inventory management system with AI driven insights enables a perioperative team to set up custom alerts notifying them of when products are set to expire (e.g., 30, 60 days ahead of time). With this visibility and knowledge, the team can optimize inventory by using items ahead of their expiry dates, even moving them from one OR to another based on supply levels and case schedules.

Most importantly, it helps a perioperative team avoid "never events" that could lead to patient harm. In addition to expiry tracking, the solution matches supply inventory to recalled items, and alerts a clinician if they attempt to use an expired or recalled product on a patient.



average reported expired products on shelves



With this visibility and knowledge, the team can

OPTIMIZE INVENTORY by

using items ahead of their expiry dates





CONCLUSION

With margin pressures, hospitals must look everywhere they can for operational and financial improvements, including the OR. Perioperative leaders burdened by extra work and stressed by staffing shortages recognize the need for greater efficiency, but in many cases, they lack the insights to know where to start. This report is intended to help perioperative leaders understand key efficiency drivers and detractors. With this knowledge, they can pursue meaningful improvements to support the longterm viability of their healthcare organizations and sustain the delivery of high-quality care to their communities.

Contact Owens & Minor to learn how their innovative solutions and technologies across the Products & Healthcare Services as well as Patient Direct business can help you lower overall costs, improve efficiency and ultimately improve the health of your supply chain. Email omlearnmore@owens-minor.com or call 1-866-935-0798-9120





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