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WHITEPAPER

The OR Data Gap: Why Most AI Investments Fall Short and What It Takes to Make Them Work

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The OR carries the hospital — but runs on incomplete information

Few clinical environments carry as much financial and operational weight as the operating room (OR). Surgical services generate up to 70% of a hospital’s total revenue, with supply costs, implant usage, and case volume directly impacting margin. For perioperative leaders and financial leaders alike, the OR is not simply a clinical space; it is the organization’s most consequential business unit.

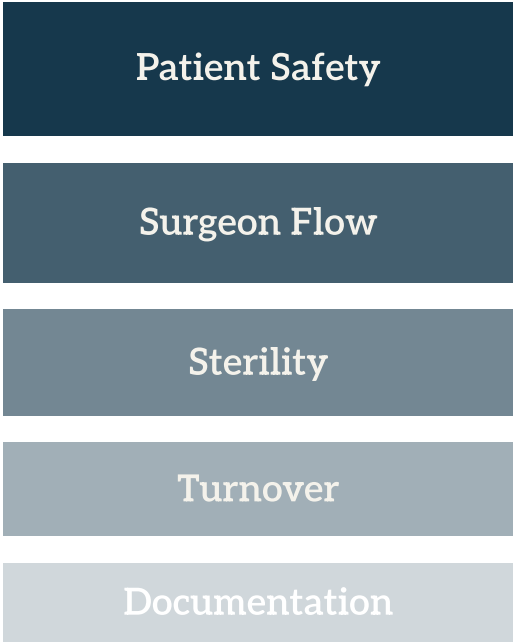
And yet, the data used to manage it tells an incomplete story. The inputs that drive the most consequential decisions — which supplies were used, which implants were placed, what was wasted, what was documented but never charged — are captured through processes that were never built for the conditions of an active OR.

Why documentation fails in the OR

Circulating nurses are responsible for tracking implant and supply usage in real time, but that responsibility sits below patient safety, sterility maintenance, and room turnover on their list of priorities — as it should. When a case becomes complex, runs long, or demands clinical attention, documentation is the first thing that slips.

Research reflects this directly: intraoperative documentation carries an **overall error rate as high as 17%**, and when recording is delayed by more than 20 minutes after an event, that rate **climbs to 38.4%**.

The OR Priority Stack



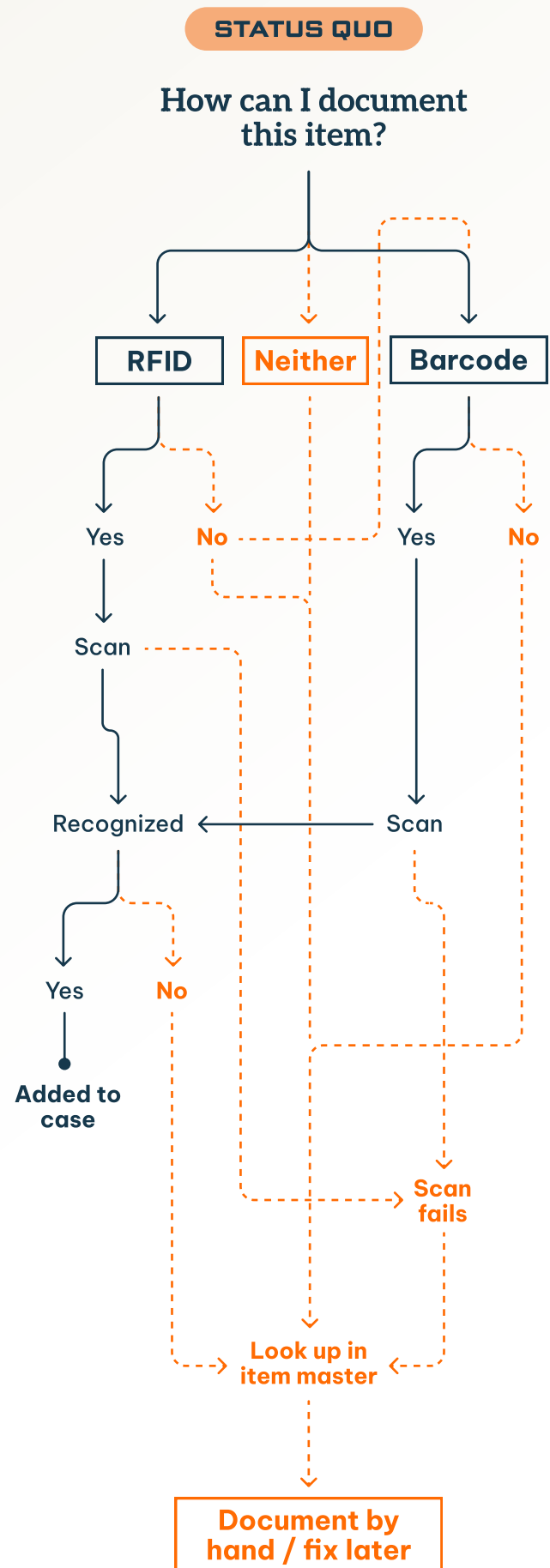
The result is gaps in capture, items scanned or entered after the patient has left the room, and details reconstructed from memory and packaging. The problem is most acute for high-value physician-preference items such as implants and tissues, which typically require manual scanning or stickering and are most vulnerable to misses in complex, fast-moving cases. This is not a workforce problem. It is a structural one, and in an environment where undocumented items translate directly to unbilled charges, the financial consequences compound quietly across every case.

Bolt-on AI cannot solve foundational problems

Health systems have invested heavily in tools designed to address this – barcode scanning, RFID, and automated charging systems deployed with genuine intent to reduce documentation burden and improve capture accuracy. These tools work if documentation is a top priority. In the OR, it never is.

This is not a new pattern. Healthcare has accumulated a quiet graveyard of AI tools – implemented with real intent, then abandoned because they were never designed around the workflows they were meant to support. OR documentation technology has followed the same arc.

The core limitation of these tools is that they are additive, point solutions solving for gaps versus the workflow end to end. For every item, a clinician must first determine how to document: does it have an RFID tag? A barcode that will actually scan? If neither, it requires a manual lookup against a hospital item master – itself often incomplete for single-use or physician preference items – with documentation deferred until after the case.



That decision tree repeats across dozens of products per case, adding cognitive burden to an already pressured workflow. When a scan fails or the case demands full attention, the step gets skipped. Many facilities maintain parallel paper-based documentation precisely because teams don't fully trust that their patchwork systems caught everything, doubling the burden rather than reducing it. And when gaps surface after the case closes, teams reconstruct what occurred from packaging, memory, and peer input, which is time-consuming and error-prone.

The consequence is a data integrity gap: a growing distance between what happened in the OR and the story the data tells. Each undocumented item, each reconstructed case, each workaround accepted as normal practice adds to a foundation of inputs that is structurally unreliable.

Reporting platforms and AI-powered dashboards integrated with the electronic health record (EHR) can optimize the data they receive, but they cannot analyze what was never captured. Layering sophisticated tools onto incomplete inputs does not solve a data integrity problem — it obscures it.



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Closing the gap requires technology built for today's reality

The shift required is not incremental. Rather than asking clinical teams to add another documentation step to a workflow already operating at capacity, the question becomes: how can we solve this problem from the ground up, with simpler workflows as the first requirement?

This is the premise of ambient capture — an approach already gaining traction in clinical documentation more broadly, where AI-powered tools listen to physician-patient encounters and generate structured notes, dramatically reducing time spent on manual entry.

At its core, ambient capture shifts documentation from something clinicians do to something the environment captures automatically.

Computer vision capture applies this principle to the physical environment of the OR – not by listening, but by recognizing items – and represents a practical implementation of ambient design in one of healthcare’s most complex settings.

Products are recognized as they are used, automatically and in real time. Each item is identified against a continuously learning product database and recorded directly into the EHR, with data flowing seamlessly into downstream systems like the ERP. Because this happens within the natural flow of a surgical case, more than 98% of items are captured, including trunk stock and products not included in the hospital item master.

There is no decision paralysis, almost no scanning errors, no reliance on limited hospital item masters, no parallel documentation path. Every item used is captured as it happens, creating a complete record for clinician verification. The result is a trusted data layer that bridges the gap between the EHR (the system of record) and downstream systems and workflows such as charge capture and the ERP (the system of finance).

AssistIQ pioneered this model for perioperative and procedural environments. Our platform uses computer vision to identify and record supplies, implants, and tissue as they are used, without barcodes, manual entry, or additional steps for the clinical team. The system improves over time as it encounters new and unfamiliar products.



EHR

✓	Inventory Item: MESH MARLEX 3x6 0112680
✓	Supply Type: IMPLANT
✓	Exp Date: 04/15/2027
✓	Model/Cat Number: 0112680
Unique Device Identifier	
✓	Serial Number: 31415926-5358979
✓	Lot Number: 1618

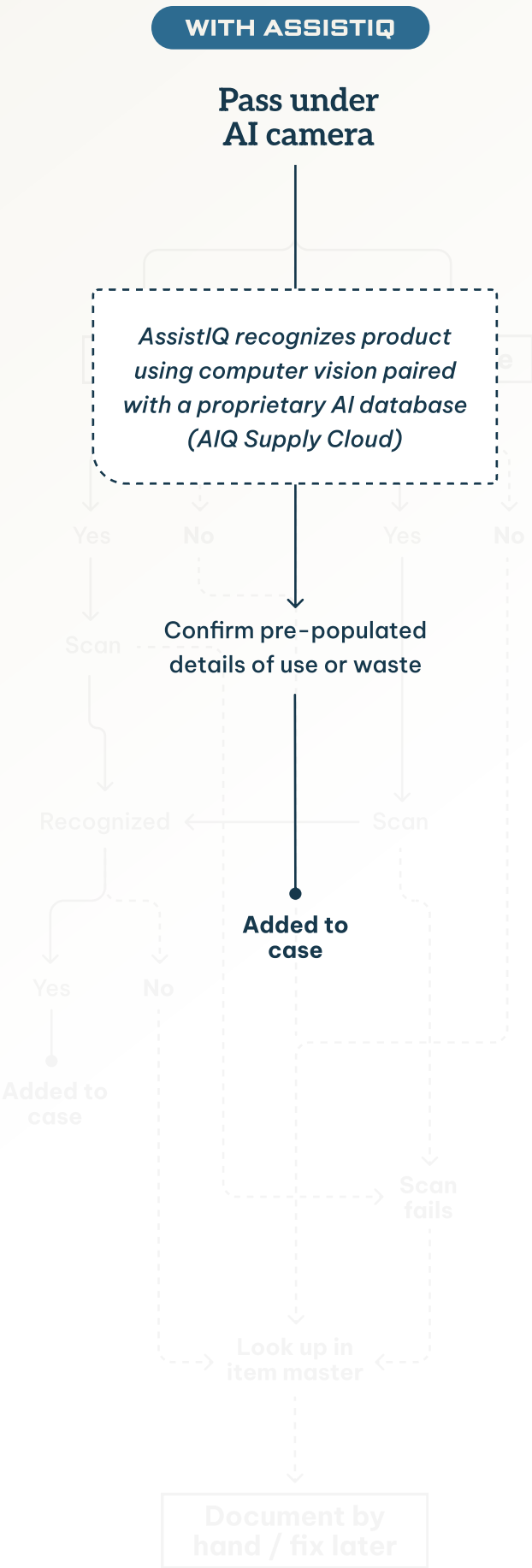
From documentation to verification: A nuanced shift in clinical roles

One of the more consequential changes enabled by computer vision capture is a shift in what clinical teams are asked to do – and where their expertise is most valuable.

With reliable capture in place, the baseline record is generated automatically as items are opened and handled in the natural course of the case. The nurse's role becomes one of confirmation and expert oversight: reviewing what the system captured, flagging exceptions, and applying clinical judgment that no automated system can replicate. Professional accountability for the record remains unchanged; only the method of producing it changes.

Reliable data unlocks what wasn't possible before

When capture is complete, real-time, and trustworthy, it doesn't just improve what teams already do – it unlocks capabilities that were structurally out of reach. Cross-department visibility becomes possible when everyone is working from the same data. Automated flags surface one-time or non-contracted product usage that often escapes procurement entirely. Cost-per-case analytics by surgeon and service line move from aspirational to operational. The tools health systems have already invested in don't necessarily change; the foundation they depend on does.



Early deployments of AssistIQ at Allina Health and Owensboro Health offer a concrete look at what that foundation enables – across financial, clinical, operational, and workforce dimensions.

Financial Impact

Revenue integrity depends on documentation completeness. Products that are used and undocumented represent direct margin loss because charges cannot be sent for products that are never registered as opened and used. The impact of closing that gap can be substantial.

At Allina Health, results in the electrophysiology (EP) lab and catheterization lab (cath lab) are striking: chargeable products captured increased by 201% in the EP lab and 364% in the cath lab, driving average monthly billed amounts up by 32% and 171%, respectively. At Owensboro Health, deploying AI-assisted capture across 16 operating rooms increased net revenue from accurately documenting more chargeable products by 12% with no increase in case volume, meaning every dollar was incremental. Owensboro also reduced expired product costs by 48% and cut inventory depletion errors by more than 90%. For supply chain leaders at both organizations, the broader value was the same: visibility into what was actually being used in cases, in a form reliable enough to act on.

Reliable capture also improves inventory management. At both organizations, assumptions about waste became measurable for the first time. Allina recovered 84% of identified waste value through vendor credits, a category of savings that had previously been invisible.

Clinical Impact

Accurate lot, serial, and expiration data enables faster, more reliable recall response, reducing patient risk and administrative burden simultaneously. When a device manufacturer issues a recall, the ability to identify affected patients within hours rather than days is a direct patient safety outcome.



Eliminating in-case documentation tasks also allows clinical teams to maintain attention where it belongs – a shift that clinical teams at both Owensboro Health and Allina Health have cited as one of the most immediate and tangible benefits of the platform.

Operational Impact

Accurate, real-time supply data improves demand planning, reduces stockouts, and creates automatic visibility into non-contracted or one-time product usage – a category that routinely escapes standard procurement tracking. More strategically, it enables the cost-per-case conversations that have historically been difficult to have. When supply usage is documented consistently across surgeons and service lines, variation moves from anecdotal to actionable. And when that data flows across departments, supply chain, clinical, and finance teams are finally working from the same record, aligned on what actually happened in each case rather than reconciling competing versions of it.

For supply chain teams, computer vision capture also resolves a longstanding blind spot: products without barcodes or whose barcodes don't scan cleanly simply disappear from the record under conventional methods, taking their lot numbers, expiration dates, and serial numbers with them.

Workforce Impact

Reducing documentation burden has workforce implications beyond individual efficiency. Teams operating in high-stress, documentation-heavy environments experience greater burnout, so reducing that burden contributes to job satisfaction and sustained performance. Equally important: when all team members work from the same trusted, real-time data, the organizational friction of competing records and the time spent reconciling them is eliminated. Shared data enables shared accountability.



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Four questions to evaluate any capture solution

The history of healthcare technology is littered with tools that promised to solve OR complexity and instead added to it. Before investing in any new approach to OR data capture, perioperative leaders should apply a direct test:

1. Does the solution fit how clinical teams actually work and reduce their burden in the process?

The test is not whether a tool is digital, but whether it fits naturally into the workflow and reduces the total volume of tasks required. Clinicians are highly motivated to follow quality standards and do the right thing.

When a documentation tool consistently gets bypassed, the problem is rarely compliance – it's design. A solution that works with clinical workflow gets used; one that asks teams to work differently will be worked around, regardless of its technical capabilities.

3. Is the resulting data trustworthy enough to act on?

If clinical and operational teams don't trust the data, they won't act on it. Data quality in the OR is not proven in controlled environments or demos; it is proven in real-world use. In clinical terms, it's the difference between efficacy and effectiveness.

At Allina Health, that threshold was cleared when capture accuracy exceeded 99% across more than 3,000 cases – at which point the data became a foundation for clinical and supply chain conversations that had previously stalled for lack of a reliable source of truth. Reliable data is a prerequisite for the organizational trust that makes improvement possible.

2. Does it capture data in real time, or rely on retrospective memory?

Post-case reconstruction is not documentation. It is estimation. Any tool that depends on human recall to fill gaps will inherit the limitations of that recall, and those limitations are not evenly distributed across case complexity.

A high-acuity, multi-hour procedure with multiple implants and supply substitutions creates a very different recall burden than a routine case, yet both demand the same standard of accuracy for billing, traceability, and cost analysis. The question to ask is not whether teams are capable of accurate recall, but whether a system should depend on it.

4. Does the solution get more accurate over time?

Tools dependent on fixed item masters or manual configuration degrade as product catalogs change and new items enter the OR.

A solution built on a continuously updated AI model compounds in value over time – learning from new products, correcting gaps, and improving accuracy with every case. That trajectory matters as much as point-in-time performance.

Optimal OR performance starts with an accurate picture of reality

Health system leaders are not lacking for dashboards, tools, or ambition. What many are missing is a reliable account of what actually happened during the case — one that doesn't depend on a nurse's ability to document under pressure, or on a system that was never designed to work without manual input.

The analytics investments health systems have made are not the problem. The gap is in the data flowing into them. Incomplete inputs produce incomplete insight that no amount of analytical sophistication can overcome. Closing the OR data gap is a design problem that requires infrastructure built to capture reality as it occurs.

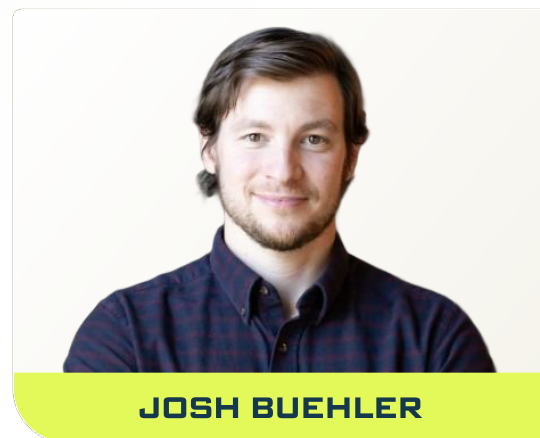
AssistIQ is designed to be that infrastructure — so that every downstream tool, every strategic conversation, and every clinical decision starts from a shared and accurate picture of what actually happened in the room. ✨

AssistIQ delivers trusted, real-time visibility into perioperative and procedural workflows.

AIQ Capture uses AI and computer vision to document every implant, tissue and supply as it is used, integrating accurate data into the EHR and ERP.

Health systems recover revenue, lighten documentation burden, and gain a trusted data foundation for operational and clinical decisions.

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