TOP 5

SURGEON CONCERNS SLOWING SURGICAL ROBOT ADOPTION

AN IDR MEDICAL PERSPECTIVE

IDR Medical
Intelligence Driven Results

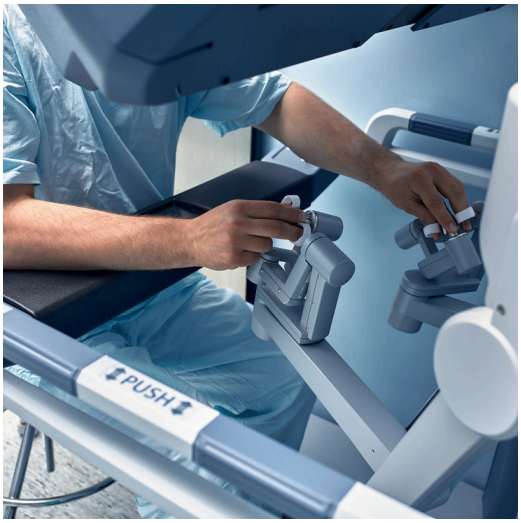
Executive Summary

Robotic-assisted surgery is widely regarded as one of the most transformative healthcare innovations of the past two decades. The global surgical robotics market has grown steadily, with adoption across multiple specialties. Yet, despite significant investment and clinical interest, penetration remains below expectations.

Through our research with surgeons and key opinion leaders globally, IDR Medical has identified five recurring concerns that are slowing adoption. These issues, ranging from clinical skepticism to economic pressures, highlight the importance of aligning technology development with surgeon needs, health system priorities, and evidence-based outcomes.

Introduction

IDR Medical has partnered with leading MedTech organizations for nearly 20 years, conducting market research and strategic analysis to guide innovation and adoption. Our conversations with surgeons, hospital administrators, and payers consistently surface the same tension: robotics represents an exciting future, but adoption decisions are still weighed against pressing clinical, financial, and operational realities.



This whitepaper outlines the five key concerns voiced by surgeons that are slowing widespread adoption of robotic-assisted surgery. Understanding and addressing these barriers is essential for stakeholders who aim to accelerate uptake while delivering meaningful clinical and economic value.

The Top 5 Surgeon Concerns

1. Learning Curve and Training Burden

Surgeons emphasize the steep learning curve associated with robotics. While robotic systems can enhance dexterity and visualization, initial cases often require extended operating times, creating inefficiencies and scheduling challenges for already constrained operating rooms. A lack of standardized training pathways further compounds the problem. According to the Royal College of Surgeons, *"there are no established protocols or minimum requirements for robotic training of either established surgeons or surgeons in training."*

Recent evidence underscores the variability in access to training. A 2024 survey of surgical residents found that over 60% had not participated in manufacturer-led or wet-lab training before performing robotic-assisted procedures, even though nearly 78% expressed strong interest in a nationally organized training program. Another national survey of over 240 surgical training programs reported that while 63% of trainees had participated in robotic cases, only 18% had operated at the console, and approximately half felt that robotic surgery at their institution actually interfered with traditional surgical training.

Conversely, new data suggest that when structured access and mentorship are available, surgical skills can be acquired more quickly on robotic than laparoscopic platforms highlighting that the issue is not capability, but consistency and access to high-quality training.

Takeaway: Structured, standardized training programs, supported by simulation, mentorship, and competency validation are critical to reducing early inefficiencies and building surgeon confidence.

The Top 5 Surgeon Concerns

2. Loss of Tactile Feedback

One of the most frequently cited drawbacks of robotic-assisted surgery is the absence of tactile or haptic feedback. Surgeons accustomed to the subtle cues of open or laparoscopic procedures express concern that robotics may compromise precision during delicate tissue handling.

Evidence supports the importance of tactile input in surgical performance. In one controlled study, integrating tactile feedback into a robotic system significantly reduced grasping forces and tissue damage among both expert and novice surgeons demonstrating that restoring haptics can directly enhance safety and precision. However, most commercial robotic systems still lack true tactile feedback, as the technology remains largely confined to research settings due to challenges in sensor integration and system complexity.

As a result, many surgeons report relying more heavily on visual cues and extensive experience to compensate for the loss of physical sensation. While this adaptation is possible, it often extends the learning curve and can reduce confidence, especially in high-risk or complex cases.

Encouragingly, technology is beginning to close this gap. In 2024, Intuitive Surgical introduced the da Vinci 5 system, the first FDA-approved platform to incorporate real-time force feedback. This next-generation system allows surgeons to sense tissue tension, pulling forces, and pressure during dissection and suturing marking a major step toward restoring the natural feel of surgery.

Takeaway: As tactile and force-sensing technologies mature, they will play a pivotal role in rebuilding surgeon trust and expanding the use of robotics in procedures where precision and feedback are critical.

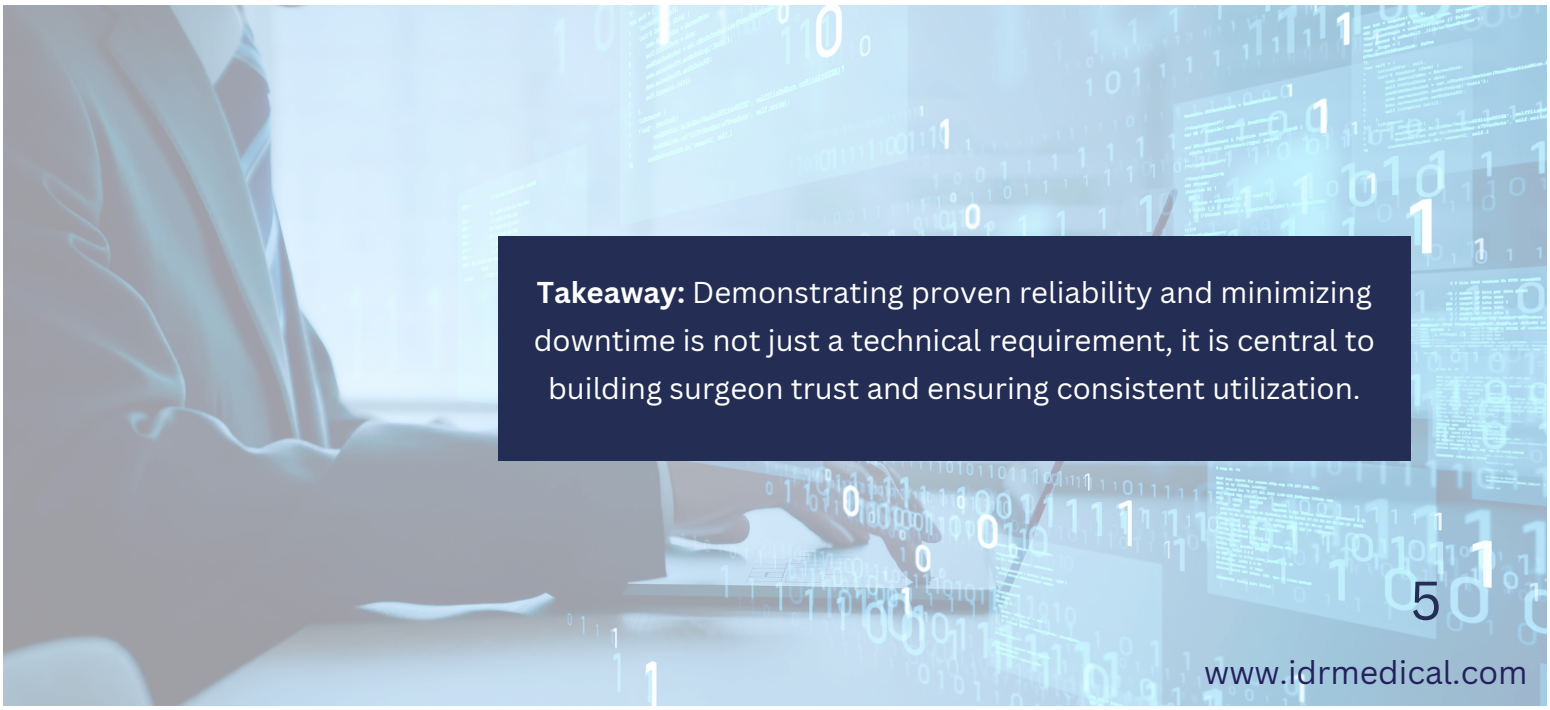
The Top 5 Surgeon Concerns

3. System Reliability and Downtime

Surgeons consistently highlight system reliability as a critical factor in adopting robotic-assisted surgery. Confidence that a robot will perform flawlessly throughout a procedure is essential. Any malfunction, interruption, or unexpected error can introduce delays, compromise patient safety, and leave a lasting impression that discourages future use.

Even isolated incidents of downtime have a disproportionate impact on surgeon trust and scheduling confidence, particularly in high-stakes or time-sensitive procedures. These concerns are compounded by the complexity of integrating robotics into already busy operating rooms, where any delay can ripple across the surgical schedule.

From an industry perspective, robust reliability metrics, rapid technical support, and redundancy protocols are crucial to alleviating surgeon hesitation. Case studies and hospital reports indicate that when technical issues are addressed proactively through preventive maintenance, backup instruments, and on-site support surgeons are significantly more willing to adopt and integrate robotic systems into routine practice.



Takeaway: Demonstrating proven reliability and minimizing downtime is not just a technical requirement, it is central to building surgeon trust and ensuring consistent utilization.

The Top 5 Surgeon Concerns

4. Cost and Reimbursement Uncertainty

Economic considerations are a major barrier to robotic adoption. Surgeons frequently cite the high upfront capital costs, ongoing service fees, and disposable instrument expenses as obstacles, particularly when hospitals face constrained budgets. Without clear evidence of superior outcomes or reimbursement pathways, hospitals often limit access to robotic systems, which in turn slows surgeon experience and confidence.

Research from our own Surgical Robotics Pricing Project highlights variability in hospital purchasing models. Some institutions prefer outright capital purchases, while others favor pay-per-use or managed service agreements, and funding sources vary across regions from departmental budgets to philanthropic contributions. This fragmented financial landscape makes it difficult for hospitals to justify widespread investment without compelling economic evidence.

Takeaway: To accelerate adoption, manufacturers must clearly articulate the value proposition, combining clinical benefit with health-economic evidence, and engage with payers to align reimbursement models with real-world use. Transparent cost structures and flexible purchasing options can mitigate financial hesitation and expand access.

The Top 5 Surgeon Concerns

5. Clinical Evidence and Outcomes Validation

Despite growing adoption, many surgeons remain skeptical about whether robotic-assisted surgery consistently delivers better outcomes compared to advanced laparoscopic techniques. Evidence to date often demonstrates equivalence rather than superiority, leading some clinicians to view adoption as technology-driven rather than patient outcome-driven.

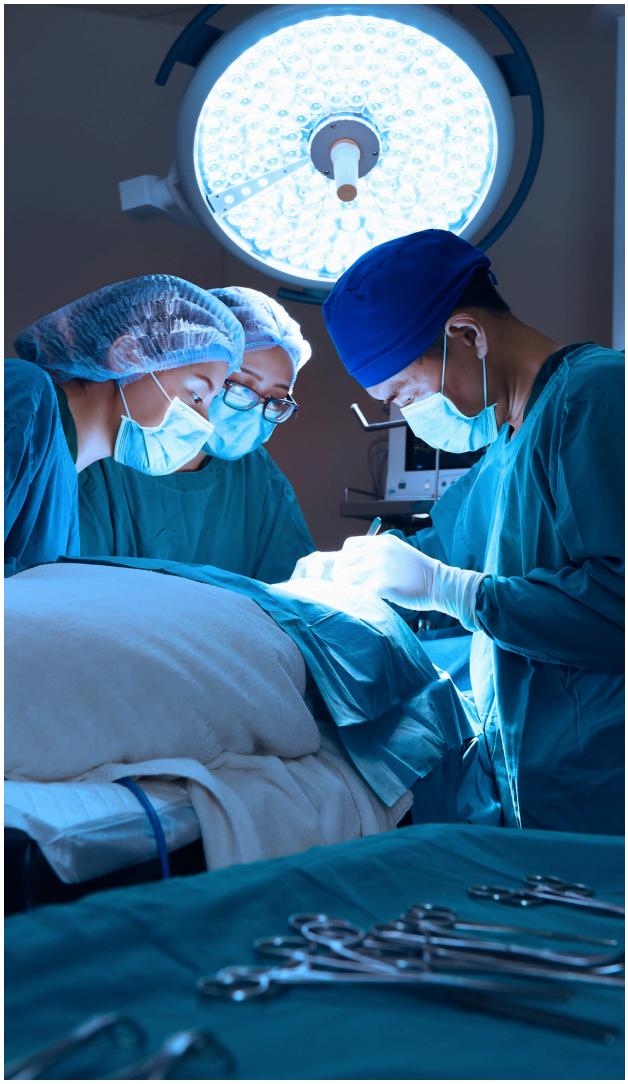
The Royal College of Surgeons has noted that the field suffers from a lack of comprehensive, longitudinal data that could reveal patterns, trends, and real-world benefits across surgical procedures. Without robust, specialty-specific studies, stakeholders struggle to quantify improvements in safety, efficiency, or long-term patient outcomes.

For robotic-assisted surgery to become a trusted standard of care, the industry must invest in longitudinal studies, real-world data collection, and targeted clinical trials. Integrating digital surgery platforms that capture intraoperative metrics and post-operative outcomes can help build the evidence base necessary to justify adoption and secure payer support.

Takeaway: Strengthening the clinical evidence base is essential for overcoming skepticism, guiding investment, and demonstrating that robotics delivers meaningful value to both surgeons and patients.

Conclusion

From an IDR Medical perspective, the adoption of surgical robotics is not constrained by technology alone. Instead, success depends on aligning innovation with surgeon priorities and healthcare system realities. Addressing the five key concerns: **learning curve, tactile feedback, system reliability, cost, and clinical evidence** is essential to moving robotic-assisted surgery from promising innovation to trusted standard of care.



By investing in structured training programs, advanced haptic technologies, reliable systems, transparent economic models, and robust clinical evidence, stakeholders can reduce barriers, build surgeon confidence, and expand adoption in a sustainable way. The future of robotic-assisted surgery depends on evidence-driven solutions that deliver meaningful clinical and operational value.

IDR Medical's Role

As a specialized healthcare consultancy, IDR Medical partners with MedTech companies to:

- Conduct deep market research with surgeons and commercial stakeholders.
- Identify barriers to adoption and refine value propositions.
- Develop strategies that align technology innovation with surgeon and hospital needs.

By bringing the surgeon's voice into the center of strategy, we help clients accelerate adoption, mitigate risks, and capture opportunities in evolving markets.