

Transitions (The Future of Orthopedics)

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A transition is underway at *AJO*. As we discuss the future of the “new journal,” I often think about the future of orthopedics. I’ve decided my vision of the future is centered on 3 components. First, there will be a change in our training paradigm from an apprenticeship model to standardized training, where core competencies must be demonstrated for certification. Second, robots and computers will improve our diagnostic accuracy and will allow us to perform surgery with improved component positioning, while biologics and genetic analysis will accelerate nature’s ability to heal, and perhaps regenerate, injured tissue. Finally, computerized algorithms and technologically improved surgical outcomes will allow us to deliver high-quality healthcare at a lower cost, producing the value our current health systems are striving for, and leveling the playing field between high-volume centers and rural institutions forced to offer complete service lines.

In this issue, we examine robotic-assisted arthroplasty and its role in modern healthcare. I think the best argument for robots in the operating room might come from the airline industry. I’m sitting on a plane as I write this, without once thinking about how much experience my pilot has in the cockpit. I know our pilot has demonstrated the core competencies required to safely operate the plane, trained on emergency simulations, and logged the necessary hours before being handed the controls. I also know that the instrumentation is so good that the plane can essentially fly itself, making pilot skill and experience less relevant. In short, technology has, in all but rare circumstances, made our pilots virtually interchangeable.

Unfortunately, none of the above is true in orthopedics. Our residents are not required to demonstrate their skills before any licensing authority, simulator training is not available in all programs, and we’ve limited resident work hours. Yet it’s that same interchangeability

that most healthcare models assume. No one argues that high-volume centers have better results when it comes to arthroplasty, but only a small percentage of total joints are currently performed at these centers. Surgeon training remains a virtual apprenticeship, lacking standardization, and resulting in a wide variation in skill and experience. Surgical residencies are not awarded based on dexterity, and work hour restrictions, Relative Value Unit-based academic contracts, patient expectations, and staffing pressures can lead to reduced hands-on experience for trainees. The results: an entire generation of surgeons with decreased repetitions in the operating room when compared to their predecessors.

That’s why I believe we are on the cusp of a transition in the operating room, and that computer-assisted surgery is here to stay. While studies exist showing robots have tighter control over virtually every identifiable metric, little data currently exists supporting enhanced long-term outcomes. But as long as component malposition remains a leading cause of early failure, there will be a place for technologies that enhance accuracy of component placement. At odds with the drive for increased technology is the necessity of cost containment, leading us to question the value of robotic-assisted surgery, and whether the improved metrics are clinically important and the additional potential complications are worth the risk.

In the articles in this issue, we will take a critical look at the benefits and drawbacks of robotic surgery. As you read, think about the future of orthopedics and how you will implement new technology into your practice. A transition is coming, and I invite each of you to consider leading it.



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