9. Making data-driven decisions in spinal surgery

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Background

Spinal deformity surgery is the most expensive and complicated procedure in orthopedic surgery. In addition to clinical outcomes, economic decisions are important in this costly area of healthcare. The criteria for choosing a medical device manufacturer are diverse and include personal relationships, economic factors, ease of use, unique factors, environmental impact, and data. But how do we use data like angles, screw pull-out, and failure rates in our decision making?

Total Technology Ecosystems

From an economic perspective, it makes sense to choose value-based care, such as that offered by Neo. Concrete cost improvements have been demonstrated: reduced operational costs by saving over $1600/€1415 per case, improved intraoperative efficiency by reducing operating time by almost 30% and decluttering the OR by reducing instrument and implant requirements by 90%[1]. With its single-use sterile platforms, force control capabilities and accessible AI/AR technology for all indications, including degeneration, trauma, tumor and deformity, it acts as a unique total technology ecosystem. Outcomes have been shown to be better, with fewer implant loosening and failures[2,3], and less deep implant infections[2]. Environmental impact is decreased through material efficiency, reducing the carbon footprint per case by 75%[4].

What Are We Talking About in Spinal Deformity Surgery?

When experts talk about deformity surgery today, they are primarily talking about complications. About 70% of all publications on adult spinal deformity correction report on reoperation rates and the incidence of complications, including potentially life-threatening complications and complications associated with disability. There is a clear need to improve patient outcomes. In addition, surgeons want technology to improve intraoperative control of spinal alignment[5]. Artificial Intelligence offers a significant advantage in guiding complex procedures that require high precision and accuracy, and has tremendous potential to revolutionize spine care[6].

Adjusting Our Technology Adoption Criteria

Future technology for spine surgery should be value-based providing clinical and economic benefits. In the total technology ecosystem of Neo, streamlined and perioperatively integrated instruments for all indications support cost improvement. Integrated functionality helps to control correction and fixation forces to improves patient outcome. And intraoperative navigation using accessible AI/AR technology supports both cost and outcome improvement.

Conclusions

Multilevel spinal fusion procedures are expensive, invasive, and complicated, and yet our patients willingly allow us to perform this. We have an ethical, moral, and global obligation to provide the best care possible, while reducing costs and complications, and improving outcome. Honest and objective analysis of our collective experience should inform our decision making. Technology, when used appropriately, will allow us to provide the best possible care and outcomes for our patients.

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