

Emerging Spinecare Trends

Biological Solutions

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Spine surgery represents intervention into a complex and intricate 3D space surrounded by vital and delicate structures. Future breakthroughs in surgical planning will lead to better surgical outcomes. Computers will increasingly be utilized to help surgeons plan and participate in preparatory virtual sessions before spine surgery. Preoperative imaging data will be reformatted to digitally recreate internal spine environments in multiple dimensions. Computer generated models will be used to predict morphological characteristics after surgery and will also be used to predict spinal tissue function and mechanical stability.

Integrated data from imaging procedures will continue to be used to guide delicate stereotactic procedures. They will simply become more controlled and precise. The surgical field is relatively small and structurally complex therefore a digitally reconstructed landscape using both endoscopic and macroscopic views will be used to help plan and guide procedures. Increasingly powerful hardware and software will be used in the future to fuse datasets from multimodality imaging sources such as CT, MRI and PET. The datasets will be used to develop computer simulated perspectives and assist neuronavigation systems. Advanced surgical planning is and will remain one of the most important steps for improving the outcome of spine surgery. The future operating suite will include robotic options, real-time virtual imaging of the surgical field and advanced stereotactic navigation equipment.

Multidisciplinary spinecare will lead to greater application of conservative treatment measures and biological solutions. This will play a particularly important role in the treatment of spine disorders associated with aging and related degenerative changes. The term biological solutions refer to the use of the body's natural physiological processes and innate ability to recover. The approach encompasses a broad spectrum ranging from biochemical manipulation with clinical nutrition to surgical implantation of grafted tissue, biological tissue scaffolding or other supportive materials.

In the near future the list of biological solutions will include proteomic and genomic intervention. Surgery will be used to deliver materials and products which can be implanted to synergistically work with or to replace diseased or degenerated tissues of the spine. Predictive multidimensional imaging reformatting and reconstruction will be used to predict how the treated area of the spine will look and function. The use of biologic material during spine surgery will represent one of the most exciting developments in future spinecare.