

Spine surgery competency

Spine surgery **competency** refers to the comprehensive ability of a surgeon to safely and effectively manage spinal disorders through surgical intervention. It includes a blend of medical knowledge, technical skill, clinical judgment, and professional behavior.

□ Core Components of Competency 1. Theoretical Knowledge Detailed spinal anatomy (bony, neural, vascular, ligamentous).

Pathophysiology of common conditions: herniated discs, spinal stenosis, spondylolisthesis, tumors, infections, deformities.

Surgical indications and contraindications.

Principles of spinal instrumentation and biomechanics.

2. Technical Skills Mastery of surgical approaches: anterior, posterior, lateral.

Performing procedures such as decompressions, fusions, discectomies, osteotomies.

Efficient and safe intraoperative flow.

Use of navigation systems, robotics, and minimally invasive techniques.

3. Clinical Judgment Appropriate surgical decision-making.

Managing intraoperative findings and complications.

Postoperative care and follow-up criteria.

Avoiding over-indication or unnecessary surgery.

4. Professionalism & Communication Informed consent process.

Clear communication with patients and families.

Collaboration with multidisciplinary teams.

Ethical conduct and transparency.

□ Assessment of Competency Formative assessments: surgical simulations, operative video review, logbooks, supervised cases.

Summative assessments: oral and written exams, direct observation (e.g., DOPS, mini-CEX).

Outcome metrics: complication rates, patient-reported outcomes (ODI, VAS, SF-36), readmission or reoperation rates.

□ Simulation and Technology Use of cadaver labs, virtual and augmented reality, synthetic models to enhance training.

Robotic systems and intraoperative navigation for precision and learning curves.

□ Certification and Maintenance Often governed by national or international boards.

Requirements may include:

Minimum number of supervised cases.

Completion of certified training programs.

Peer-reviewed evaluations.

Ongoing CME and recertification exams.

□ Advanced Spine Surgery Competency Mastery of minimally invasive spine surgery (MISS).

Complex deformity correction.

Revision spine surgery.

Spinal oncology surgery.

Integration of AI, big data, and intraoperative monitoring.

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