

Peripheral Nerve Surgery Competency

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1. Core Knowledge Areas

a. Peripheral Nerve Anatomy Detailed understanding of peripheral nerve pathways and branches.

Knowledge of major nerve plexuses (brachial, lumbar, sacral).

Surgical anatomy, including relationships with vascular, muscular, and skeletal structures.

b. Neurophysiology Principles of nerve conduction and signal transmission.

Mechanisms of nerve injury and regeneration.

Understanding of electrodiagnostic tools (e.g., EMG, nerve conduction studies).

c. Pathophysiology of Nerve Injuries Classification systems (e.g., Seddon, Sunderland).

Concepts: neuropraxia, axonotmesis, neurotmesis.

Mechanisms of nerve entrapment, trauma, and tumor infiltration.

2. Clinical Competencies a. Diagnosis & Evaluation Accurate neurological examination (motor, sensory, reflex).

Interpretation of electrodiagnostic studies.

Imaging modalities: MRI neurography, ultrasound, CT.

Differential diagnosis (central vs. peripheral).

b. Decision-Making & Surgical Planning Indications for surgery: entrapments (e.g., carpal tunnel), trauma, tumors, chronic pain.

Timing of surgical intervention (early vs. delayed).

Risk assessment and patient selection.

c. Surgical Skills Microsurgical techniques: nerve dissection, neurolysis, nerve grafting, and transfers.

Use of operative microscope or loupes.

Mastery of suture techniques (epineurial, perineurial).

Hemostasis and soft-tissue handling to prevent scarring or re-entrapment.

d. Intraoperative Neurophysiology Use of nerve stimulators and intraoperative monitoring.

Identification of functional vs. non-functional nerve segments.

3. Postoperative Care & Outcomes Assessment Management of neuropathic pain, motor/sensory recovery, and complications.

Rehabilitation protocols: physiotherapy, occupational therapy, splinting.

Use of [standardized](#) outcome measures (e.g., DASH, MRC grading).

4. Professional and Ethical Behavior Informed consent and patient communication.

Shared decision-making with multidisciplinary teams (e.g., neurology, rehab).

Continuous self-assessment and surgical audit.

Commitment to lifelong learning and evidence-based practice.

[Peripheral nerve decompression](#) (PND), including [carpal tunnel release](#) and [ulnar nerve decompression](#), is a common procedure performed by neurosurgeons, orthopedic surgeons, and plastic surgeons. Because of the lack of established [assessment parameters](#) and [performance standards](#) for Entrustable Professional Activities in PND in the current [literature](#), Skulsampaopol et al. conducted this study to define these assessment parameters and identify the expected standards of performance for graduating residents across the fields of neurosurgery, plastic surgery, and orthopedic surgery.

Methods: Electronic survey was sent to neurosurgery, plastic surgery, and orthopedic surgery faculty to obtain their perspectives on parameters of assessment and the expected standard competence performance regarding PND.

Results: Sixty-one participants returned fully completed questionnaires giving a completion rate of 53%. The overall recommended number of assessments was 5, and the recommended number of assessors was 2. Regarding each specialty, there was no significant difference in the recommended number of assessments; however, neurosurgeons and orthopedic surgeons recommended a significantly fewer median number of assessors ($n = 2$) than plastic surgeons ($n = 3$) ($P = .01$). Based on total responses, 77% believed that PND was appropriate for the general practice of their specialties. The majority of respondents expected graduating residents to achieve level E (50.8%) or level D (42.6%) for PND. There was no significant difference in the belief that PND was appropriate for general practice of their specialty or considering entrustment level E as a graduation target across

the specialties.

The study found significant agreement across specialties in the parameters of assessment expected of residents and the expected levels of mastery for independent practice. These results are relevant to residency programs and certification bodies like the American Accreditation Council for Graduate Medical Education in designing the assessment of milestones related to peripheral nerve surgery. This study has important implications for the design of residency and fellowship education in peripheral nerve surgery internationally ¹⁾.

¹⁾

Skulsampaopol J, Ming Y, Cusimano MD. Establishing Competency Assessment Standards for Graduating Neurosurgery, Plastic Surgery, and Orthopedic Surgery Residents in Peripheral Nerve Surgery. *Oper Neurosurg* (Hagerstown). 2025 Mar 5. doi: 10.1227/ons.0000000000001521. Epub ahead of print. PMID: 40042278.

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