Dalhousie University Neurosurgery
Resident Rotation Objectives: Orthopedic Surgery

Medical Expert

KNOWLEDGE

As a basis for clinical competence, the neurosurgeon must be familiar with, and able to describe and discuss:

1. The embryological development of the spine, including how congenital anomalies arise from disorders of this process.
2. Spinal biomechanics.
3. Radiological characteristics of the normal and pathological spine i.e. Plain films, computed tomography, magnetic resonance imaging
4. Degenerative spondylosis of the cervical and lumbar spine.
5. Spondylolisthesis.
6. Adult scoliosis.
7. Primary spine and spinal cord tumours.
8. Rheumatoid arthritis
9. Ankylosing spondylolitis
10. Ossification of the posterior longitudinal ligament
11. Discitis
12. Epidemiology and management of patients with spine trauma.
13. Classification schemes of spinal instability.
14. Options for management of patients with adult spinal deformities.
15. Utility and application of various spinal orthoses.
16. Use and interpretation of electrophysiological investigations (EMG/NCS).
17. Non-surgical approaches to back pain and radiculopathy.
18. Lumbar disc disease.
19. Cervical disc disease.
20. The role of spinal arthroplasty.
21. The biochemical basis and indications for the use of biologics (BMP) in patients undergoing spinal surgery.
22. The role of intraoperative monitoring.
23. Discuss the biology of bone healing and options for bone grafting in spinal surgery.
24. Discuss the signs, symptoms and management options for adult tethered cord and syringomyelia.

CLINICAL SKILLS

1. Become proficient in the practiced discipline of obtaining a detailed history from the patient and his/her family, where appropriate, and carrying out a detailed examination in order to provide a comprehensive differential diagnosis and localization of diseases affecting the spine and spinal cord.

2. Demonstrate the ability to perform various aspects of the musculoskeletal assessment necessary in assessing a patient with appendicular pain (shoulder, elbow, hip, knee, etc).
3. Become familiar with identifying patients with secondary gain presenting with spine related complaints.
4. Demonstrate skill and knowledge in ordering and interpreting appropriate diagnostic tests (diagnostic imaging, hematology, chemistry, etc) for the satisfactory management of the spinal patient.
5. Understand the importance of ongoing post-operative neurological assessment in patients with spinal disorders.

TECHNICAL SKILLS

At the completion of training, the neurosurgery resident must have demonstrated a thorough understanding of the surgical anatomy of the spine, and the technical ability to satisfactorily and safely perform the following procedures:

1. Surgical exposure of the lumbar spine:
    a. Dorsal approach
    b. Ventral approach
    c. Retroperitoneal approach
2. Surgical exposure of the thoracic spine:
    a. Dorsal approach
    b. Transthoracic approach
    c. Retropleural approach
3. Surgical exposure of the cervical spine:
    a. Dorsal approach
    b. Ventral approach
4. Decompression of neural elements using a posterior approach:
    a. Laminotomy
    b. Laminectomy
    c. Laminoplasty
5. Surgical management of lumbar disc pathology:
    a. Foraminotomy
    b. Discectomy (including open, microscopic, minimal access techniques)
        i. Posterolateral and far lateral herniations
6. Surgical placement of lumbar interbody devices
    a. ALIF, PLIF, TLIF
7. Cannulation and placement of pedicle screws
    a. Lumbar, Thoracic and Cervical spine
    b. Open and Minimal access techniques
8. Harvesting bone graft
    a. Anterior and Posterior Iliac crest
9. Surgical management of cervical disc disease
    a. Anterior cervical discectomy and fusion

b. Posterior cervical foraminotomy +/- discectomy
    i. Open and minimal access
10. Application and adjustment of skeletal traction for closed reduction of fractures

Communicator

1. Display an aptitude in establishing therapeutic relationships with patients and their families.
2. Clearly document appropriate histories, physical examinations, and progress notes.
3. Provide patients with the appropriate information to facilitate their involvement in the clinical decision-making process.
4. Prepare written documentation for referring physicians in a timely, concise, and collegial manner.
5. Provide appropriate information to covering physicians to ensure patient safety and continuity of care when not directly available.

Collaborator

1. Become proficient with the consultation process, with other physicians (referring physicians and other specialists) as well as allied health care professionals (including nurses, social workers, physiotherapists, occupational therapists and orthotists).
2. Attend and contribute to interdisciplinary rounds/activities as needed.

Leader

1. The neurosurgical resident must learn to manage their time effectively in order to prioritize clinical activities, learning needs, administrative responsibilities, and research endeavors.
2. The neurosurgical resident should be prepared to provide advice on the efficient use of hospital resources (specifically regarding the use of diagnostic imaging, operating room utilization and surgical implants) for the management of acute spine injuries and elective spinal disorders.

Health Advocate

1. Use available resources to assist with patients' educational, socio-economic, and psychological challenges.
2. Understand the implications of smoking on spinal health and demonstrate the ability to assist those patients willing to commit to cessation.
3. Demonstrate an understanding of the importance of a healthy lifestyle on spinal health and be able to educate patients in this regard.

Scholar

1. Attendance and active participation in general orthopaedic trauma rounds as well as specific Spine Program meetings, namely Spine Journal Club and Challenging Cases Rounds.
2. Demonstrate self-directed learning and an appreciation for critical appraisal of relevant literature.
3. Facilitate the learning of patients and their families, colleagues, and other allied health care professionals.

Professional

1. Demonstrate the characteristics of integrity, honesty, compassion, and ethical conduct.
2. Meets deadlines, is punctual, monitors patients according to the needs of their condition, and provides follow-up.
3. Understands any limitations of knowledge or skill, accepts constructive feedback, and corrects deficiencies appropriately.
4. Demonstrate an understanding of the importance of industry in managing the spinal patient and be able to recognize and rectify inappropriate or unethical relationships.