

Spinal Surgical Referrals: The Rule of Ones

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Neck pain and low back pain are the most common reasons for visits to primary-care physicians.

If you suspect a surgical lesion is responsible for these symptoms, how urgently should your patient be assessed by a spine surgeon?

The urgency of the referral should be based on the history, physical examination and investigation. The main considerations include:

- duration of symptoms,
- severity of the neurologic deficits,
- diagnosis,
- radiologic confirmation of the surgical lesion and
- imminent damage to the neural elements.

Ideally, appointments with the surgeon should be made using the “rule of ones” (Table 1):

- one day,
- one week,
- one month,
- one quarter or
- one year from the onset of symptoms.

Table 1

The rule of ones

Urgency	Presentation	Diagnosis
1 day	Acute spinal cord injury Acute <i>cauda equina</i> syndrome	Acute spinal fracture Acute spinal hematoma
1 week		Spinal infection
1 month	Chronic spinal cord injury Chronic <i>cauda equina</i> syndrome Chronic myelopathy	All spinal tumours Cervical spondylotic myelopathy Thoracic myelopathy
1 quarter	Foot drop	Acute cervical radiculopathy Acute lumbar radiculopathy
1 year	Non-radicular neck pain Non-radicular back pain	Lumbar stenosis

CASE #1

You have treated this 32-year-old woman with chronic low back pain for five years. She presents with sudden onset of bilateral leg pain and leg weakness with urinary retention since last night.

- Examination: She is in acute distress; straight leg raising test is positive bilaterally; there is weakness in ankle dorsiflexion bilaterally; her anal tone is lax with perineal anesthesia
- Investigation: Magnetic resonance imaging (MRI) (Figure 1)

What is your diagnosis? What is the urgency?

- Diagnosis: Acute *cauda equina* syndrome; central L4-5 disc herniation
- Urgency: One day; immediate



Figure 1. MRI.

CASE #2

This 35-year-old woman presents with a one-month history of gradual onset of neck and right arm pain with motor weakness. Her predominant complaint is arm pain.

- Examination: Limitation of neck movement; weakness of the right biceps with depressed bicep reflex
- Investigation: Computed tomography (CT) scan; MRI (Figure 2)

What is your diagnosis? What is the urgency?

- Diagnosis: Acute C6 radiculopathy; acute C5-6 disc herniation
- Urgency: One quarter
- Note: Acute cervical radiculopathy usually improves spontaneously within three months; thus, surgery is not recommended without a trial of nonoperative management

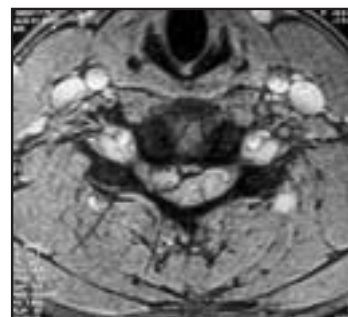


Figure 2. MRI.

CASE #3

This 45-year-old man has come to your office twice in the last month with a three-month history of excruciating neck pain. There is no complaint of arm pain or weakness. You have tried non-steroidal anti-inflammatory drugs, physiotherapy and transcutaneous electrical nerve stimulation.

- Examination: Normal
- Investigation: CT scan; MRI (Figure 3)

What is your diagnosis? What is the urgency?

- Diagnosis: Degenerative cervical disc disease
- Urgency: One year
- Note: Without a radiculopathy or a myelopathy, surgical treatment is usually not indicated



Figure 3. MRI.



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CASE #4

This 65-year-old man has noticed difficulty with walking in the last two months. He describes his legs as "being stiff and wobbly." He has also noticed poor hand grip with numbness. There is no neck pain.

- Examination: Tone is increased in both arms and legs; grade 4/5 weakness is noted in arm and leg muscles with hyperreflexia and upgoing toes
- Investigation: MRI (Figure 4)

What is your diagnosis? What is the urgency?

- Diagnosis: Cervical spondylotic myelopathy with spinal cord signal change
- Urgency: One month to one quarter
- Note: Semi-urgent surgical intervention may be required to prevent further spinal cord damage



Figure 4. MRI.

CASE #5

This 56-year-old, obese woman presents with progressively worsening low back pain for the last five months. She complains of subjective weakness, but no leg pain.

- Examination: Normal; no nerve root irritation; no leg weakness
- Investigation: CT scan; MRI (Figure 5)

What is your diagnosis? What is the urgency?

- Diagnosis: Degenerative disc disease; lumbar stenosis
- Urgency: One year
- Note: Surgery is not indicated without radiculopathy or leg weakness



Figure 5. MRI.

CASE #6

A 56-year-old breast cancer survivor presents with a two-week history of sudden back pain.

- Examination: Pain on palpation of the thoracolumbar junction; tone is increased in the lower extremities with diffuse weakness of Grade 4/5; hyperreflexia, upgoing toes and a sensory level of T12 are also noted
- Investigation: Plain X-rays; CT scan (Figure 6)

What is your diagnosis? What is the urgency?

- Diagnosis: Pathological T12 fracture; spinal metastasis; thoracic myelopathy
- Urgency: One week to one month



Figure 6. CT scan.

CASE #7

This 82-year-old woman slipped and fell on the icy sidewalk four days ago. She landed on her back. She presents to your office with new onset of low back pain.

- Examination: The thoracolumbar junction is tender to palpation; her neurologic examination is normal except for numbness in the L1 distribution
- Investigation: Plain X-rays; CT scan, MRI (Figure 7)

What is your diagnosis? What is the urgency?

- Diagnosis: Acute L1 burst fracture
- Urgency: One day
- Note: Although this patient is neurologically intact, all acute spinal fractures should be seen immediately; delay in patient presentation results in assessment outside the suggested timeframe



Figure 7. MRI.

CASE #8

This 32-year-old firefighter was injured playing volleyball four months ago. He presents with low back and left leg pain. There is also associated leg weakness.

- Examination: He has a positive straight-leg raising test to 40° on the left; there is weakness of ankle plantarflexion and depressed ankle jerk
- Investigation: MRI (Figure 8)

What is your diagnosis? What is the urgency?

- Diagnosis: Acute S1 radiculopathy; acute L5-S1 herniation
- Urgency: One quarter
- Note: Acute lumbar radiculopathy usually improves in three months; this patient may require surgery since he continues to be symptomatic after four months

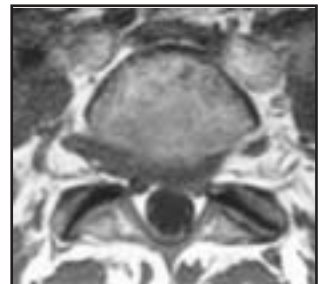


Figure 8. MRI.