

## SPINAL CORD COMPRESSION

### Rationale

This guideline is adapted for inter-professional primary care providers working in various settings in VIHA and any other clinical practice setting in which a user may see the guidelines as applicable.

### Scope

This guideline provides recommendations for the assessment and symptom management of adult patients (age 19 years and older) with advanced life threatening illness and experiencing the symptom of spinal cord compression. This guideline does not address disease specific approaches in the management of spinal cord compression.

The vertebral column is the most common site of skeletal metastasis.<sup>(1)</sup> Seventy percent of patients dying from cancer have spinal metastases at autopsy.<sup>(1)</sup> Cord compression occurs in 5% to 10% of all patients with malignancy <sup>(1-8)</sup> but account for 25% of all central nervous system tumours.<sup>(3)</sup>

### Definition of Terms

**Spinal Cord Compression** develops when the spinal cord is compressed by a tumour, abscess or other lesion. It is regarded as a medical emergency independent of its cause, and requires swift diagnosis and treatment to prevent long-term disability due to irreversible spinal cord injury.<sup>(9, 10)</sup>

### Standard of Care

1. Assessment
2. Diagnosis
3. Prognosis
4. Education
5. Treatment: Non-pharmacological
6. Treatment: Pharmacological

#### Recommendation 1

#### Assessment of Spinal Cord Compression

Ongoing comprehensive assessment is the foundation of effective management of spinal cord compression, including interview, physical assessment, medication review, medical and surgical review, psychosocial review, review of physical environment and appropriate diagnostics (*see Table 1*). Assessment must determine the cause, effectiveness and impact on quality of life for the patient and their family.

Table 1: Spinal Cord Compression Assessment using Acronym O,P,Q,R,S,T,U and V\*

<b>O</b> Onset	When did it begin? How long have you had the pain, constipation, weakness? Have you had this before?
<b>P</b> Provoking / Palliating	What brings the pain on? What makes it better? Does cough, sneeze or pressure make it worse?
<b>Q</b> Quality	What does it feel like? Can you describe it? Is it a band-like pain?
<b>R</b> Region / Radiation	Where is it? Does it spread anywhere?
<b>S</b> Severity	What is the intensity of this symptom (On a scale of 0 to 10 with 0 being none and 10 being worst possible)? Right now? At best? At worst? On average? How bothered are you by this symptom? Are there any other symptom(s) that accompany this symptom?
<b>T</b> Treatment	What medications and treatments are you currently using? How effective are these? Do you have any side effects from the medications and treatments? What medications and treatments have you used in the past?
<b>U</b> Understanding/ Impact on You	What do you believe is causing this symptom? How is this symptom affecting you and / or your family?
<b>V</b> Values	What is your goal for this symptom? What is your comfort goal or acceptable level for this symptom (On a scale of 0 to 10 with 0 being none and 10 being worst possible)? Are there any other views or feelings about this symptom that are important to you or your family?

\* also include a Physical Assessment (as appropriate for symptom)

**Symptoms:**

- **Pain** is the presenting symptom in 90 to 95% of patients<sup>(1, 11)</sup> Two types of pain:<sup>(1)</sup>
- **Local back pain** (midline/paravertebral) nearly always present.<sup>(1)</sup>
  - Usually constant, close to site of lesion.<sup>(1)</sup>
  - Relieved by sitting or standing up (as opposed to disc disease which is relieved by laying down). <sup>(1, 8)</sup>

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- Exacerbated by any increase in intrathoracic pressure (sneeze, cough, Valsalva maneuver, straining at stool).<sup>(1, 4)</sup>
- Above historic points may be only clue to impending spinal cord compression.<sup>(1)</sup>
- **Radicular pain** from spinal root compression occurs in 66% of patients.<sup>(1)</sup>
  - More common with lumbosacral (90%) and cervical (79%) metastases than with thoracic metastases (55% of cases).<sup>(1)</sup>
  - Patients complain of a band or girdle of pain/tightness radiating from back to front; in extremities, radicular pain usually unilateral.<sup>(1)</sup>
  - Exacerbated by recumbency, movement, cough, sneeze, Valsalva maneuver.<sup>(1, 3, 12)</sup>
  - Worse at night.<sup>(1, 3, 8, 12)</sup>
  - Improved by sitting or standing.<sup>(1, 8)</sup>
  - Radiates in a dermatomal pattern.<sup>(1)</sup>
  - May produce numbness and tingling (cervical, thoracic or lumbar root).<sup>(1)</sup> When progresses numbness usually precedes weakness.
  - May resemble pain from intervertebral disc disease, pleurisy, cholecystitis or pancreatitis.<sup>(1)</sup>
  - Distinguish from brachial or lumbosacral plexus involvement.<sup>(1)</sup>
  - Localizes the lesion within one or two vertebral segments.<sup>(1)</sup>
- **Weakness** in legs is the next symptom if left untreated (76% of patients).<sup>(1)</sup>
  - Experienced as stiffness, dragging of a limb or unsteadiness.<sup>(1, 12)</sup>
- **Sensory disturbances** may accompany or be preceded by (in 51% of patients).<sup>(1)</sup>
  - Numbness usually begins in the toes, gradually ascends to level of cord compression (usually without paresthesias).<sup>(1, 12)</sup>
  - Sensation of coldness.<sup>(1, 12)</sup>
  - Upper limit of sensory level often one to two vertebral bodies below site of compression.<sup>(1)</sup>
  - Sensory loss progresses to ataxia (3% of patients).<sup>(1)</sup>
- **Autonomic dysfunction** (57% of patients).<sup>(1)</sup>
  - Early signs: loss of bladder control, hesitancy, urgency.
  - Late signs: urinary retention, overflow incontinence.<sup>(1, 12)</sup>
  - Constipation.<sup>(1)</sup>
  - Loss of perspiration below level of the lesion.<sup>(1)</sup>
  - Sexual difficulties.<sup>(12)</sup>
- Signs and symptoms probably not due solely to compression of cord; ischemia secondary to vascular involvement may also be a factor (especially when cord compression develops suddenly over a few hours).<sup>(1, 8)</sup>

### **Distribution:**<sup>(1, 3, 5, 12)</sup>

- Thoracic spine – 70% <sup>(8,13)</sup> which has a smaller ratio of spinal canal to cord diameter than the other two spinal segments.<sup>(8)</sup>
- Multiple contiguous levels – 10% to 38%.<sup>(7)</sup>
- Lumbosacral spine – 20%.
- Cervical spine – 10%.

**Incidence In Malignancy:**<sup>(1)</sup>

- Lung – 16%
- Breast – 12%
- Unknown primary – 11%
- Lymphoma – 11%
- Myeloma – 9%

**Recommendation 2**

**Diagnosis**

Management should include treating reversible causes where possible and desirable according to the goals of care. The most significant intervention in the management of spinal cord compression is identifying underlying cause(s) and treating as appropriate. While underlying cause(s) may be evident, treatment may not be indicated, depending on the stage of the disease.

Whether or not the underlying cause(s) can be relieved or treated, all patients will benefit from management of the symptom using education, specialist intervention or medications.

Identifying the underlying etiology of the spinal cord compression is essential in determining the interventions required.

The importance of early diagnosis cannot be over-emphasized; symptoms are usually present for some weeks before neurological emergency occurs.<sup>(3, 4)</sup> In rural communities where treatment may require travel the importance of early diagnosis is even more crucial.

- Extent of diagnostic workup indicated in any given case depends on overall condition of patient. In patients expected to live more than 1 to 2 months and who are not already paraplegic the following tests are indicated:<sup>(1)</sup>
  - Evidence of epidural metastases may be seen on plain x-rays in approximately 85% of patients<sup>(1)</sup> but only predicts the level of compression in 19%.<sup>(3)</sup>
  - Urgent referral for **CT scans and MRI** improves early detection. MRI scans are more sensitive than CT Scans and are the standard for diagnosis.<sup>(3, 6, 7)</sup> Whole spine MRI is more sensitive in detecting small CNS metastases that can be missed with other imaging methods. <sup>(6,11)</sup> Myelography has a place where CT scan and MRI are not available.<sup>(4)</sup>

**Recommendation 3**

**Prognosis**

- The degree of neurologic function at diagnosis and the start of treatment is the most significant factor in determining the recovery of function.<sup>(1, 14)</sup>

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- Rapid onset (less than 48 hours) and progression of symptoms are poor prognostic indicators.<sup>(2)</sup> Patients who are not mobile at presentation do not generally regain the ability to walk.<sup>(6)</sup> Of patients who are paraplegic pre-treatment, only 10% will regain ambulation after treatment.<sup>(13)</sup>
- If the patient has been paralyzed for more than 48 hours, the chance of neurological recovery is very poor.<sup>(3)</sup> “Emergency” treatment at this point may not be indicated but palliative radiation for pain management may be beneficial (per British Columbia Cancer Agency).<sup>(15)</sup>

Start I.V. corticosteroids to reduce edema and improve neurological function while completing diagnostic workup when history and physical examination suggest spinal cord compression.<sup>(1, 3, 16)</sup>

- Spinal cord compression is an emergency necessitating immediate assessment and treatment<sup>(2, 3, 6, 14)</sup> requiring urgent consultation of the radiation oncologist and neurosurgeon at the closest available site.<sup>(10)</sup> A Radiation Oncologist will treat with radiotherapy on weekends.<sup>(13)</sup>

### Recommendation 4

#### Education

- Patients at risk should be identified and taught the signs and symptoms of spinal cord compression and the urgency of reporting promptly.<sup>(1)</sup>
- Explain procedures and details of ongoing investigations with patients and family.<sup>(6)</sup>

### Recommendation 5

#### Treatment: Non-pharmacological

- Malignant spinal cord compression should be individualized and should take into consideration pretreatment ambulatory status, previous treatment, co-morbidities, technical surgical factors, the presence of bony compression and spinal instability, potential surgical complication, potential radiotherapy reactions and patient preferences.<sup>(17)</sup>
- Management requires a combined effort from the family physician, radiation oncologist and spinal surgeon.<sup>(14)</sup>
- **Radiation therapy** should be started immediately after diagnosis.<sup>(1, 6, 13)</sup>
  - Radiation therapy provides definitive treatment in most patients.<sup>(2, 3, 5, 8, 14, 16)</sup> Indications for radiation therapy include known radiosensitive tumour and no spinal instability<sup>(1, 5, 7, 11, 17)</sup> and for palliative therapy in patients who present with paraplegia.<sup>(7)</sup>
  - Radiation therapy alone gives equivalent results to laminectomy plus adjuvant radiation therapy<sup>(1, 4)</sup> and is effective in over 85% of cases of spinal cord compression.<sup>(6)</sup>
  - Patients who are ambulatory at the time of the diagnosis have a higher probability of obtaining good response to treatment and a longer survival.<sup>(3)</sup>

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- Patients who experience progressive neurological deficits despite receiving radiotherapy should be considered candidates for urgent surgical decompression and/or stabilization.<sup>(7)</sup>
- **Surgery** may be considered if the patient is ambulatory and otherwise stable with good performance status.<sup>(1-3)</sup>
  - Surgery is the first choice where the site of the primary tumour is unknown, where there is relapse after radiation treatment, and in cases of spinal instability or vertebral displacement.<sup>(8, 11)</sup> It should also be considered when neurological symptoms progress during radiotherapy, in plegia of rapid onset, or where tumours are not radiosensitive. <sup>(4, 12, 14)</sup>
- **Rehabilitation** must commence on diagnosis and must encompass the skills of various professionals. Ensure that goals are short term and attainable so as to achieve the best possible quality of life.<sup>(6, 8)</sup>
  - If patient immobile, treat as if they have an unstable spine during repositioning.<sup>(6)</sup>
  - Apply anti-embolic stockings if patient has impaired mobility.<sup>(6)</sup>
  - Ensure emotional and psychosocial support for patient and family.<sup>(6)</sup>

### Recommendation 6

### Treatment: Pharmacological

**Dexamethasone** 10 to 100 mg I.V. STAT<sup>(3, 4, 11)</sup> then 16 to 96 mg PO daily, then taper over 10 to 14 days after improvement or irreversibility.<sup>(1, 5, 11)</sup>

- Shown to improve neurologic function and relieve pain, reduce edema and have a direct oncolytic effect.<sup>(1)</sup> Dexamethasone may also temporarily prevent the onset of cord ischemia.<sup>(2)</sup>
- In patients with short prognosis or poor performance status, corticosteroids may be the only treatment feasible.<sup>(1, 2)</sup>
- Consider the use of prophylactic heparin if the patient has impaired mobility.<sup>(6)</sup>

Severe pain will usually require rapid titration of an opioid drug to achieve analgesia.<sup>(1)</sup>

### References

Information was compiled using the CINAHL, Medline (1996 to April 2006) and Cochrane DSR, ACP Journal Club, DARE and CCTR databases, limiting to reviews/systematic reviews, clinical trials, case studies and guidelines/protocols using spinal cord compression terms in conjunction with palliative/hospice/end of life/dying. Palliative care textbooks mentioned in generated articles were hand searched. Articles not written in English were excluded.

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