

Medical Treatment Guidelines

Washington State Department of Labor and Industries

Work-Related Acute Cauda Equina Syndrome (CES)

Diagnosis and Treatment Table of Contents

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I. Review criteria for the Diagnosis and Treatment of Acute Cauda Equina Syndrome (CES)

As request may be appropriate for	If the patient has	AND the diagnosis is supported by these clinical findings			AND this has been done (if recommended)
Surgical Procedure	Diagnosis	Subjective	Objective	Imaging	
Lumbar decompression	Cauda Equina Syndrome	Partial or complete loss of bladder and/or bowel function (incontinence or retention not otherwise explained) AND/OR Acute low back pain AND/OR Bilateral/unilateral sciatica AND/OR Sexual dysfunction	Diminished or absent anal sphincter tone AND/OR Saddle anesthesia AND/OR Numbness and/or weakness involving both legs or multiple nerve roots in one leg is present AND/OR Urinary retention, incontinence, and / or patulous anus AND/OR Reduced or absent bulbo cavernosus reflex AND/OR Gait disturbances	A lesion with mass effect on the cauda equina is present in the spinal canal, compressing multiple lumbo-sacral nerve roots (usually large mass effect) as documented by: Lumbar MRI (the diagnostic procedure of choice) OR CT or CT myelography may provide useful information, especially when MRI cannot be done or is limited by hardware artifact	Conservative care alone is rarely indicated

Work-Related Acute Cauda Equina Syndrome (CES)

Diagnosis and Treatment

II. INTRODUCTION

This guideline is intended as an educational resource for physicians who treat injured workers in the Washington workers' compensation system under Title 51 RCW. The guideline serves as a review criteria for the Department's utilization review team to help ensure diagnosis and treatment of cauda equina syndrome is of the highest quality. The emphasis is on accurate diagnosis and treatment that is curative or rehabilitative (see WAC 296-20-01002 for definitions).

This guideline was developed in 2009 by Washington State's Labor and Industries' Industrial Insurance Medical Advisory Committee (IIMAC). One of the committee's goals is to provide standards that ensure a uniformly high quality of care for injured workers in Washington State. This guideline summarizes information from the available medical literature and expert clinical opinion to help physicians make an accurate diagnosis quickly and deliver the appropriate care as soon as possible.

Acute cauda equina syndrome (CES*) is a rare, compressive disorder of the lumbosacral nerve roots below the tip of the conus medullaris. Only a small number of patients who present with back pain will have CES. It is characterized by multiple lumbo-sacral sensory-motor deficits which may have disabling long term consequences. It requires immediate surgical attention. Due to the emergent nature of CES, controlled studies are not feasible and the literature is limited to case series, case studies and narrative reviews.

*In this guideline, all references made to CES are considered acute cauda equina syndrome.

III. ESTABLISHING WORK-RELATEDNESS

Work-related activities may cause or contribute to the development of CES. Establishing work-relatedness requires all of the following:

1. Exposure: Workplace activities that contribute to or cause CES, and
2. Outcome: A diagnosis of CES that meets the diagnostic criteria and
3. Relationship: Generally accepted scientific evidence, which establishes on a more probable than not basis (greater than 50%) that the workplace activities (exposure) in an individual case contributed to the development or worsening of the condition (outcome).

CES has been reported to result from the following work- and non-work-related conditions.^{1, 2}

- Disc herniation (most common cause; most often central herniation)
- Trauma (e.g. gunshot wound, vertebral fracture)
- Infection (e.g. discitis, vertebral osteomyelitis, epidural abscess)
- Degenerative conditions (e.g. degenerative spondylolisthesis, spinal stenosis)
- Metastatic or primary tumor (with or without pathologic fracture)
- Post-surgical complications (e.g. epidural hematoma, fat graft, durotomy, use of Gelfoam)
- Vascular malformations (e.g. bleeding arteriovenous malformations)
- Intradiscal electrothermal annuloplasty
- Spinal manipulation

IV. MAKING THE DIAGNOSIS

A. SYMPTOMS AND SIGNS

The hallmark symptoms of CES include: ³⁻⁸

- Partial or complete loss of bladder function (incontinence or retention not otherwise explained) and/or bowel function, accompanied by impaired perineal sensation, especially saddle anesthesia
- Diminished or absent anal sphincter tone
- Reduced or absent bulbo-cavernosus reflex
- Sexual dysfunction
- Impaired sensation in the lower extremities
- Acute low back pain with unilateral or bilateral sciatica
- Weakness of both legs and/or weakness involving multiple nerve roots in one leg
- Hyporeflexia or areflexia in the legs
- Gait disturbances

B. DIAGNOSTIC TESTS

MRI	Usually the preferred imaging test for characterizing and localizing spinal lesions.
CT and/or CT Myelography	Used to locate narrowing of the spinal canal; will provide useful information when MRI cannot be done or is limited by hardware artifact.
Plain x-rays	Used to identify fractures, tumors, infection, and degenerative changes.
Ultrasound	Bladder scan ultrasound to identify urinary retention
Urodynamic Tests	May objectively evaluate bladder function; should be considered only in light of the patient's clinical condition after emergent care has been given.

V. TREATMENT

A. CONSERVATIVE TREATMENT

Conservative treatment alone is rarely indicated because CES is an emergent condition and surgical decompression is the treatment of choice.

B. SURGICAL TREATMENT

To prevent further neurological deterioration, urgent surgical decompression should be performed. Decompression for rapidly progressing CES may prevent sphincter paralysis. The best surgical outcomes were reported in patients with the least neurological deficit prior to surgery. ^{2, 8-12}

Decompression surgery may range between micro discectomy and wide laminectomy with discectomy to limit the manipulation of potentially damaged neural tissue. ²

References:

1. Mauffrey, C., Randhawa, K., Lewis, C., Brewster, M., and Dabke, H., *Cauda equina syndrome: an anatomically driven review*. Br J Hosp Med (Lond), 2008. **69**(6): p. 344-7.
2. Spector, L.R., Madigan, L., Rhyne, A., Darden, B., and Kim, D., *Cauda equina syndrome*. J Am Acad Orthop Surg, 2008. **16**: p. 471-479.
3. Kostuik, J.P., *Medicolegal consequences of cauda equina syndrome: an overview*. Neurosurg Focus, 2004. **16**(6): p. 39-41.
4. Buchner, M. and Schiltenswolf, M., *Cauda equina syndrome caused by intervertebral lumbar disk prolapse: mid-term results of 22 patients and literature review*. Orthopedics, 2002. **25**(7): p. 727-731.
5. Jalloh, I. and Minhas, P., *Delays in the treatment of cauda equina syndrome due to its variable clinical features in patients presenting to the emergency department*. Emerg Med J, 2007. **24**(1): p. 33-4.
6. Shapiro, S., *Medical realities of cauda equina syndrome secondary to lumbar disc herniation*. Spine, 2000. **25**(3): p. 348-351.
7. Thongtrangan, I., Le, H., Park, J., and Kim, D.H., *Cauda equina syndrome in patients with low lumbar fractures*. Neurosurg Focus, 2004. **16**(6): p. e6.
8. Gardner, A., Gardner, E., and Morley, T., *Cauda equina syndrome: a review of the current clinical and medico-legal position*. Eur Spine J, 2011. **20**(5): p. 690-7.
9. Ahn, U.M., Ahn, N.U., Buchowski, J.M., Garrett, E.S., Sieber, A.N., and Kostuik, J.P., *Cauda equina syndrome secondary to lumbar disc herniation. A meta-analysis of surgical outcomes*. Spine, 2000. **25**(12): p. 1515-1522.
10. DeLong, W.B., Polissar, N., and Neradilek, B., *Timing of surgery in cauda equina syndrome with urinary retention: meta-analysis of observational studies*. J Neurosurg Spine, 2008. **8**(4): p. 305-20.
11. Hussain, S.A., Gullan, R.W., and Chitnavis, B.P., *Cauda equina syndrome: outcome and implications for management*. British Journal of Neurosurgery, 2003. **17**(2): p. 164-167.
12. Qureshi, A. and Sell, P., *Cauda equina syndrome treated by surgical decompression: the influence of timing on surgical outcome*. Eur Spine J, 2007. **16**: p. 2143-2151.