

Clinical Policy: Selective Dorsal Rhizotomy for Spasticity in Cerebral Palsy

Reference Number: CP.MP.174

Date of Last Revision: 11/25

[Coding Implications](#)

[Revision Log](#)

See [Important Reminder](#) at the end of this policy for important regulatory and legal information.

Description

Selective dorsal rhizotomy (SDR) is a neurosurgical technique developed to reduce spasticity and improve mobility in children with cerebral palsy (CP) and lower extremity spasticity. It involves the selective division of lumbosacral afferent (sensory) rootlets at the conus or at the intervertebral foramina under intraoperative neurophysiological guidance. Early procedures were effective at reducing spasticity but were associated with significant morbidity; however, technical advancements have reduced the invasiveness of the procedure, typically from a five-level laminoplasty to a single level laminotomy at the conus.^{4,18}

Policy/Criteria

- I. It is the policy of health plans affiliated with Centene Corporation® that *selective dorsal rhizotomy* is **medically necessary** for children with spastic CP when meeting all of the following:
 - A. Spastic diplegia, or spastic quadriplegia with no significant ataxia or dystonia;
 - B. Gross Motor Function Classification System (GMFCS) level II or III;
 - C. Age > two to < 10 years;
 - D. Good trunk control and good lower extremity antigravity strength on clinical examination;
 - E. Functional and intellectual ability to participate in physical rehabilitation;
 - F. Failure of or inability to tolerate other conservative treatment (e.g., pharmacotherapy, orthopedic management, physical therapy);
 - G. No botulinum toxin A injection has been given within the last six months;
 - H. No orthopedic surgery within the last year;
 - I. No significant scoliosis;
 - J. Periventricular leukomalacia (PVL) on MRI with no involvement of the thalamus, basal ganglia or cerebellum;
 - K. Reimers index < 40%, (i.e., no significant femoral head subluxation on pelvic radiograph.)
- II. It is the policy of health plans affiliated with Centene Corporation® that *selective dorsal rhizotomy* is **not medically necessary** for children with spastic hemiplegia, or ataxic or athetoid spasticity.

Background

Cerebral palsy (CP) refers to a heterogeneous group of conditions involving permanent nonprogressive central motor dysfunction that affect muscle tone, posture, and movement. The average age at diagnosis for children with CP is 12 to 24 months, with specific sub-type typically diagnosed after 18 to 24 months of age. The motor impairment generally results in limitations in functional ability and activity, which can range in severity. Other symptoms include altered sensation or perception, intellectual disability, communication and behavioral difficulties, seizure

disorders, and musculoskeletal complications. Although the underlying etiology itself is not progressive, the clinical expression may change over time as the nervous system matures.²

Spastic CP is characterized by muscle hypertonicity and impairment in motor skills. Spastic diplegia is one of the most frequently occurring forms of CP, with spasticity confined to the lower extremities. The gait pattern of those with spastic diplegia includes in-toeing steps, toe walking, scissoring, excessive trunk sway, and diminished walking endurance.^{17,18}

Standardized measurement of an individual's functional status can help guide treatment selection and allows for monitoring of change over time. The Gross Motor Function Classification System (GMFCS) is used to categorize functional motor impairment in children with CP. Other widely used tools for evaluating function include the Manual Ability Classification System (MACS) and the Communication Function Classification System (CFCSS). The goals of treatment for children with CP include improved motor function, increased mobility and independence, improvement in ease of care, reduction in pain and reduced extent of disability.¹⁶

The Gross Motor Function Classification System (GMFCS) for ages 6 to 12 years (modified descriptions of these categories are used for younger age groups)^{1,2,16}

- Level I: Walks in all settings; climbs stairs without using a railing; runs and jumps, but speed, balance, and coordination may be limited
- Level II: Walks in most settings, though may have difficulty walking long distances and balancing on uneven terrain; walks up and down stairs holding onto a railing; minimal ability to run and jump
- Level III: Walks using a hand-held mobility device (canes, crutches, and anterior and posterior walkers that do not support the trunk); may use wheeled mobility for longer distances; when seated, may require a seatbelt for balance; may require physical assistance when transferring from sitting to standing; may walk up and down stairs holding onto a railing with supervision or assistance
- Level IV: Generally dependent on wheeled mobility; may be able to use power mobility independently; may walk short distances with support in familiar environments; at home may use floor mobility (roll, creep, or crawl); requires adaptive seating for trunk and pelvic control; requires physical assistance for most transfers
- Level V: Transported in a manual wheelchair in all settings; limited ability to maintain antigravity head and trunk postures and control arm and leg movements; transfers require complete physical assistance

Controlling spasticity is crucial in the treatment of CP as it causes discomfort, gait abnormalities, and functional limitations. It also generates muscle shortenings that influence bone growth and leads to deformities.³ The approach to treating spasticity in children with CP is not standardized. Treatments may include pharmacotherapy (e.g., oral baclofen, benzodiazepines), nerve blocks (i.e., botulinum toxin and/or phenol injections), orthopedic management, physical therapy (PT) and occupational therapy (OT) including use of braces, orthotics and mobility devices, SDR and intrathecal administration of baclofen.¹

An SDR may be performed in selected patients with a goal of permanently diminishing spasticity and improving motor function of the lower limbs. Younger children (age > 2 years to < 10 years)

CLINICAL POLICY

Selective Dorsal Rhizotomy in CP

are generally optimal candidates for SDR since they are young enough to relearn appropriate motor patterns for ambulation. Patient selection should be rigorous, and active participation in therapies postoperatively is critical.¹

A meta-analysis of three randomized controlled trials comparing SDR plus PT with PT alone in a total of 90 children with spastic diplegia who were primarily ambulatory (most were <8 years old and most had a GMFCS level of II or III), spasticity at 9 to 12 months (assessed by the Ashworth scale) was less with SDR plus PT compared with PT alone. The SDR group had a modest, but statistically significant, improvement in motor function (assessed by the GMFM score), and this correlated with the proportion of dorsal root tissue that was transected. No serious adverse events were reported.¹ Studies suggest that the beneficial effects of childhood SDR extend to adulthood quality of life and ambulatory function without late side effects of surgery.^{9,10,11,12,18}

A recent review of the literature concluded that SDR plus postoperative PT improved gait, functional independence, and self-care in children with spastic diplegia. SDRs through multilevel laminectomies or laminoplasty were associated with spinal deformities (i.e., scoliosis, hyperlordosis, kyphosis, spondylolisthesis, spondylolysis, and nonhealing of laminoplasty), however, SDRs through a single level laminectomy prevented SDR-related spinal problems.

The use of SDR in the setting of severe motor impairment (GMFCS level IV or V) is controversial as studies are still evolving. Severe spasticity and contractures cause significant discomfort and may interfere with sitting and general caretaking. In addition, often other comorbidities exist (e.g., intellectual disability, seizure disorder). The goal of surgery in this setting is to ease the difficulty of daily caretaking, to improve comfort, and improve stability in the seated position. SDR in those severely affected generally requires greater extent of nerve root division, and as a result may experience troublesome weakness.^{1,9} Palliative SDR may be of benefit in a select few cases, including those with a lesser degree of limb involvement such as patients with spastic diplegia with the goal to ease symptoms associated with spasticity vs dystonia, according to studies cited by The Journal of Spine Surgery.^{7,19,20}

National Institute for Healthcare and Excellence (NICE)⁵

Current evidence on selective dorsal rhizotomy for spasticity in cerebral palsy shows that there is a risk of serious but well recognized complications. The evidence on efficacy is adequate. Therefore, this procedure may be used provided that normal arrangements are in place for clinical governance and audit. Parents or caregivers should be informed that SDR for spasticity in CP is irreversible, and that patients may experience deterioration in walking ability or bladder function, and later complications including spinal deformity. They should understand that prolonged physiotherapy and aftercare will be required, and that additional surgery may be necessary. This procedure and patient selection for it are still evolving with most of the evidence relating to children aged 4 through 10 years.

Coding Implications

This clinical policy references Current Procedural Terminology (CPT®). CPT® is a registered trademark of the American Medical Association. All CPT codes and descriptions are copyrighted 2024, American Medical Association. All rights reserved. CPT codes and CPT descriptions are from the current manuals and those included herein are not intended to be all inclusive and are

CLINICAL POLICY

Selective Dorsal Rhizotomy in CP

included for informational purposes only. Codes referenced in this clinical policy are for informational purposes only. Inclusion or exclusion of any codes does not guarantee coverage. Providers should reference the most up-to-date sources of professional coding guidance prior to the submission of claims for reimbursement of covered services.

CPT® Codes	Description
63185	Laminectomy with rhizotomy; 1 or 2 segments
63190	Laminectomy with rhizotomy; more than 2 segments

Reviews, Revisions, and Approvals	Revision Date	Approval Date
Policy developed. Specialist reviewed.	02/19	03/19
References reviewed and updated.	02/20	03/20
References reviewed and updated. Background updated with no impact on criteria. Replaced member with members/enrollees.	02/21	03/21
Annual review. Changed “review date” in the header to “date of last revision” and “date” in the revision log header to “revision date.” Minor edits to background. References reviewed, updated and reformatted. Reviewed by specialist.	11/21	11/21
Annual review completed. Added “muscle” in I.D. Background updated and minor rewording with no clinical significance. ICD-10 diagnosis code table removed. References reviewed, reformatted and updated.	11/22	11/22
Annual review. Updated level descriptions for "Gross Motor Function Classification System" in the background with no clinical significance. References reviewed and updated. Reviewed by external specialist.	11/23	11/23
Annual review. References reviewed and updated.	11/24	11/24
Annual review. Under I.D. replaced “No significant muscle weakness” with “Good trunk control...”. Background updated. References reviewed and updated. Reviewed by external and internal specialist.	11/25	11/25

References

1. Barkoudah E, Whitaker A. Cerebral palsy: treatment of altered motor tone and associated orthopedic issues. UpToDate. www.uptodate.com. Updated July 15, 2025. Accessed October 8, 2025.
2. Barkoudah E, Aravamuthan, B. Cerebral palsy: Classification and clinical features. UpToDate. www.uptodate.com. Updated July 1, 2025. Accessed October 8, 2025.
3. Nicolini-Panisson RD, Tedesco AP, Folle MR, Donadio MVF. Selective dorsal rhizotomy in cerebral palsy: selection criteria and postoperative physical therapy protocols. *Rev Paul Pediatr*. 2018 ;36(1):9. Published 2018 Jan 15. doi:10.1590/1984-0462/;2018;36;1;00005
4. Aquilina K, Graham D, Wimalasundera N. Selective dorsal rhizotomy: an old treatment re-emerging. [published correction appears in *Arch Dis Child*. 2017 Mar;102(3):278]. *Arch Dis Child*. 2015;100(8):798 to 802. doi:10.1136/archdischild-2014-306874
5. National Institute for Healthcare and Excellence (NICE). Selective dorsal rhizotomy for spasticity in cerebral palsy. Interventional procedures guidance. Published December 15, 2010. Accessed November 5, 2024.

6. Jeffery SMT, Markia B, Pople IK, et al. Surgical outcomes of single level bilateral selective dorsal rhizotomy for spastic diplegia in 150 consecutive patients. *World Neurosurg.* 2019;125:e60 to e66. doi:10.1016/j.wneu.2018.12.187
7. Graham D, Aquilina K, Cawker S, Paget S, Wimalasundera N. Single-level selective dorsal rhizotomy for spastic cerebral palsy. *J Spine Surg.* 2016;2(3):195 to 201. doi:10.21037/jss.2016.08.08
8. Park TS, Dobbs MB, Cho J. Evidence supporting selective dorsal rhizotomy for treatment of spastic cerebral palsy. *Cureus.* 2018;10(10):e3466. Published 2018 Oct 19. doi: 10.7759/cureus.3466.
9. Dudley RW, Parolin M, Gagnon B, et al. Long-term functional benefits of selective dorsal rhizotomy for spastic cerebral palsy. *J Neurosurg Pediatr.* 2013;12(2):142 to 150. doi: 10.3171/2013.4.PEDS12539
10. Park TS, Liu JL, Edwards C, Walter DM, Dobbs MB. Functional outcomes of childhood selective dorsal rhizotomy 20 to 28 years later. *Cureus.* 2017;9(5):e1256. Published 2017 May 2017. doi:10.7759/cureus.1256
11. Park TS, Edwards C, Liu JL, Walter DM, Dobbs MB. Beneficial effects of childhood selective dorsal rhizotomy in adulthood. *Cureus.* 2017;9(3):e1077. Published 2017 Mar 5. doi: 10.7759/cureus.1077
12. Nordmark E, Josenby AL, Lagergren J, Andersson G, Strömblad LG, Westbom L. Long-term outcomes five years after selective dorsal rhizotomy. *BMC Pediatr.* 2008;8:54. Published 2008 Dec 14. doi:10.1186/1471-2431-8-54
13. Wong AM, Pei YC, Lui TN, Chen CL, Wang CM, Chung CY. Comparison between botulinum toxin type A injection and selective posterior rhizotomy in improving gait performance in children with cerebral palsy. *J Neurosurg.* 2005;102(4 Suppl):385 to 389. doi:10.3171/ped.2005.102.4.0385
14. Grunt S, Fieggan AG, Vermeulen RJ, Becher JG, Langerak NG. Selection criteria for selective dorsal rhizotomy in children with spastic cerebral palsy: a systematic review of the literature. *Dev Med Child Neurol.* 2014;56(4):302 to 312. doi:10.1111/dmcn.12277
15. Oki A, Oberg W, Siebert B, Plante D, Walker ML, Gooch JL. Selective dorsal rhizotomy in children with spastic hemiparesis. *J Neurosurg Pediatr.* 2010;6(4):353 to 358. doi: 10.3171/2010.7.PEDS09318
16. Barkoudah E. Cerebral palsy: overview of management and prognosis. UpToDate. www.uptodate.com. Updated July 15, 2025. Accessed October 10, 2025.
17. Centers for Disease Control and Prevention (CDC). Cerebral palsy. https://www.cdc.gov/cerebral-palsy/about/?CDC_AAref_Val=https://www.cdc.gov/ncbddd/cp/facts.html. Updated July 23, 2025. Accessed October 10, 2025.
18. Graham D, Aquilina K, Mankad K, Wimalasundera N. Selective dorsal rhizotomy: current state of practice and the role of imaging. *Quant Imaging Med Surg.* 2018;8(2):209-218. doi:10.21037/qims.2018.01.08
19. D'Aquino D, Moussa AA, Ammar A, Ingale H, Vloeberghs M. Selective dorsal rhizotomy for the treatment of severe spastic cerebral palsy: efficacy and therapeutic durability in GMFCS grade IV and V children. *Acta Neurochirurgica.* 2017;160(4):811-821. doi:https://doi.org/10.1007/s00701-017-3349-z

20. Gillespie CS, Hall BJ, George AM, et al. Selective dorsal rhizotomy in non-ambulant children with cerebral palsy: a multi-center prospective study. *Childs Nerv Syst.* 2024;40(1):171-180. doi:10.1007/s00381-023-06062-4

Important Reminder

This clinical policy has been developed by appropriately experienced and licensed health care professionals based on a review and consideration of currently available generally accepted standards of medical practice; peer-reviewed medical literature; government agency/program approval status; evidence-based guidelines and positions of leading national health professional organizations; views of physicians practicing in relevant clinical areas affected by this clinical policy; and other available clinical information. The Health Plan makes no representations and accepts no liability with respect to the content of any external information used or relied upon in developing this clinical policy. This clinical policy is consistent with standards of medical practice current at the time that this clinical policy was approved. “Health Plan” means a health plan that has adopted this clinical policy and that is operated or administered, in whole or in part, by Centene Management Company, LLC, or any of such health plan’s affiliates, as applicable.

The purpose of this clinical policy is to provide a guide to medical necessity, which is a component of the guidelines used to assist in making coverage decisions and administering benefits. It does not constitute a contract or guarantee regarding payment or results. Coverage decisions and the administration of benefits are subject to all terms, conditions, exclusions and limitations of the coverage documents (e.g., evidence of coverage, certificate of coverage, policy, contract of insurance, etc.), as well as to state and federal requirements and applicable Health Plan-level administrative policies and procedures.

This clinical policy is effective as of the date determined by the Health Plan. The date of posting may not be the effective date of this clinical policy. This clinical policy may be subject to applicable legal and regulatory requirements relating to provider notification. If there is a discrepancy between the effective date of this clinical policy and any applicable legal or regulatory requirement, the requirements of law and regulation shall govern. The Health Plan retains the right to change, amend or withdraw this clinical policy, and additional clinical policies may be developed and adopted as needed, at any time.

This clinical policy does not constitute medical advice, medical treatment or medical care. It is not intended to dictate to providers how to practice medicine. Providers are expected to exercise professional medical judgment in providing the most appropriate care, and are solely responsible for the medical advice and treatment of members/enrollees. This clinical policy is not intended to recommend treatment for members/enrollees. Members/enrollees should consult with their treating physician in connection with diagnosis and treatment decisions.

Providers referred to in this clinical policy are independent contractors who exercise independent judgment and over whom the Health Plan has no control or right of control. Providers are not agents or employees of the Health Plan.

CLINICAL POLICY

Selective Dorsal Rhizotomy in CP

This clinical policy is the property of the Health Plan. Unauthorized copying, use, and distribution of this clinical policy or any information contained herein are strictly prohibited. Providers, members/enrollees and their representatives are bound to the terms and conditions expressed herein through the terms of their contracts. Where no such contract exists, providers, members/enrollees and their representatives agree to be bound by such terms and conditions by providing services to members/enrollees and/or submitting claims for payment for such services.

Note: For Medicaid members/enrollees, when state Medicaid coverage provisions conflict with the coverage provisions in this clinical policy, state Medicaid coverage provisions take precedence. Please refer to the state Medicaid manual for any coverage provisions pertaining to this clinical policy.

Note: For Medicare members/enrollees, to ensure consistency with the Medicare National Coverage Determinations (NCD) and Local Coverage Determinations (LCD), all applicable NCDs, LCDs, and Medicare Coverage Articles should be reviewed prior to applying the criteria set forth in this clinical policy. Refer to the CMS website at <http://www.cms.gov> for additional information.

©2019 Centene Corporation. All rights reserved. All materials are exclusively owned by Centene Corporation and are protected by United States copyright law and international copyright law. No part of this publication may be reproduced, copied, modified, distributed, displayed, stored in a retrieval system, transmitted in any form or by any means, or otherwise published without the prior written permission of Centene Corporation. You may not alter or remove any trademark, copyright or other notice contained herein. Centene[®] and Centene Corporation[®] are registered trademarks exclusively owned by Centene Corporation.