

Table 15: Excluded clinical studies for neurosurgical procedures for spasticity

Excluded studies - A2 Are neurosurgical procedures (intrathecal baclofen pump and selective dorsal rhizotomy) effective in adults aged 19 and over with cerebral palsy to reduce spasticity and or dystonia?	
Study	Reason for Exclusion
Agarwal, S., Patel, T., Shah, N., Patel, B. M., Comparative study of therapeutic response to baclofen vs tolperisone in spasticity, <i>Biomedicine and Pharmacotherapy</i> , 87, 628-635, 2017	Not intrathecal.
Aiona, M. D., Sussman, M. D., Treatment of spastic diplegia in patients with cerebral palsy: Part II, <i>Journal of Pediatric Orthopaedics-Part B</i> , 13, S13-S38, 2004	Expert review
Albright, A. L., Intrathecal baclofen in cerebral palsy movement disorders, <i>Journal of Child Neurology</i> , 11 Suppl 1, S29-35, 1996	Expert review
Albright, A. L., Spastic Cerebral-Palsy - Approaches to Drug-Treatment, <i>Cns Drugs</i> , 4, 17-27, 1995	Expert review
Albright, Al, Cervi, A, Singletary, J, Intrathecal baclofen for spasticity in cerebral palsy, <i>Jama</i> , 265, 1418-22, 1991	Duplicate record
Albright,A.L., Barron,W.B., Fasick,M.P., Polinko,P., Janosky,J., Continuous intrathecal baclofen infusion for spasticity of cerebral origin, <i>JAMA: Journal of the American Medical Association</i> , 270, 2475-2477, 1993	Mean age 14 years
Albright,A.L., Barry,M.J., Fasick,P., Barron,W., Shultz,B., Continuous intrathecal baclofen infusion for symptomatic generalized dystonia, <i>Neurosurgery</i> , 38, 934-938, 1996	3/5 had CP - 2 were aged 7
Albright,A.L., Barry,M.J., Hoffmann,P., Intrathecal L-baclofen for cerebral spasticity: case report, <i>Neurology</i> , 45, 2110-2111, 1995	Case report
Albright,A.L., Barry,M.J., Painter,M.J., Shultz,B., Infusion of intrathecal baclofen for generalized dystonia in cerebral palsy, <i>Journal of Neurosurgery</i> , 88, 73-76, 1998	Median age 12 years
Albright,A.L., Barry,M.J., Shafton,D.H., Ferson,S.S., Intrathecal baclofen for generalized dystonia, <i>Developmental Medicine and Child Neurology</i> , 43, 652-657, 2001	Median age 13 years
Albright,A.L., Thompson,K., Carlos,S., Minnigh,M.B., Cerebrospinal fluid baclofen concentrations in patients undergoing continuous intrathecal baclofen therapy, <i>Developmental Medicine and Child Neurology</i> , 49, 423-425, 2007	Outcome not in protocol
Aldahondo, N., Munger, M., Krach, L., Novacheck, T., Schwartz, M., Comprehensive long-term outcomes after Selective Dorsal Rhizotomy, <i>Developmental Medicine and Child Neurology</i> , 58, 28, 2016	Abstract only - insufficient detail reported to extract outcomes.

Excluded studies - A2 Are neurosurgical procedures (intrathecal baclofen pump and selective dorsal rhizotomy) effective in adults aged 19 and over with cerebral palsy to reduce spasticity and or dystonia?	
Study	Reason for Exclusion
Alden, T. D., Lytle, R. A., Park, T. S., Noetzel, M. J., Ojemann, J. G., Intrathecal baclofen withdrawal: a case report and review of the literature, <i>Childs Nervous System</i> , 18, 522-525, 2002	Case report -expert review
Al-Shaar, H. A., Alkhani, A., Intrathecal baclofen therapy for spasticity: A compliance-based study to indicate effectiveness, <i>Surgical Neurology International</i> , 7, S539-S541, 2016	8/27 had CP - not reported separately
Arishima, H., Kikuta, K. I., Intrathecal baclofen pump implantation in prone position for a cerebral palsy patient with severe scoliosis: A case report, <i>Neuromodulation</i> , 18, 214-216, 2015	Case report
Avellino, A. M., Loeser, J. D., Intrathecal baclofen for the treatment of intractable spasticity of spine or brain etiology, <i>Neuromodulation</i> , 3, 75-81, 2000	Case series (N=4 with CP)
Bakay, R. A. E., Intrathecal baclofen for intractable cerebral spasticity: A prospective placebo-controlled, double-blind study - Comment, <i>Neurosurgery</i> , 46, 610-611, 2000	comment on Albright trial
Bassani, L., Harter, D. H., Paraspinal subfascial placement of lumbar intrathecal baclofen catheters: Short-term outcomes of a novel technique - Clinical article, <i>Journal of Neurosurgery: Pediatrics</i> , 9, 93-98, 2012	Median age < 12. Outcomes not relevant
Beaufils, J., Ferrapie, A. L., Dinomais, M., Saout, V., Menei, P., Richard, I., Progression of scoliosis after intrathecal baclofen in an adult patient with multiple sclerosis, <i>Evolutive d'une scoliose apres baclofene intrathecal chez une patiente adulte sclerosee en plaque. [French, English]</i> , <i>Annals of Physical and Rehabilitation Medicine</i> , 55, e206-e207+e208, 2012	Case report
Becker, R., Alberti, O., Bauer, B.L., Continuous intrathecal baclofen infusion in severe spasticity after traumatic or hypoxic brain injury, <i>Journal of Neurology</i> , 244, 160-166, 1997	Not CP
Becker, W.J., Harris, C.J., Long, M.L., Ablett, D.P., Klein, G.M., DeForge, D.A., Long-term intrathecal baclofen therapy in patients with intractable spasticity, <i>Canadian Journal of Neurological Sciences</i> , 22, 208-217, 1995	Not CP
Beecham, E., Candy, B., Howard, R., McCulloch, R., Laddie, J., Rees, H., Vickerstaff, V., Bluebond-Langner, M., Jones, L., Pharmacological interventions for pain in children and adolescents with life-limiting conditions, <i>Cochrane Database of Systematic Reviews</i> , 3, CD010750, 2015	Systematic review - includes Bonouvire
Belverud, S., Mogilner, A., Schulder, M., Intrathecal pumps, <i>Neurotherapeutics</i> , 5, 114-122, 2008	Expert review
Bensmail, D., Quera Salva, M.A., Roche, N., Benyahia, S., Bohic, M., Denys, P., Bussel, B., Lofaso, F., Effect of intrathecal baclofen on sleep and respiratory function in patients with spasticity, <i>Neurology</i> , 67, 1432-1436, 2006	Outcomes not in protocol
Berman, B., Vaughan, C. L., Peacock, W. J., The Effect of Rhizotomy on Movement in Patients with Cerebral-Palsy, <i>American Journal of Occupational Therapy</i> <i>Am J Occup Ther</i> , 44, 511-516, 1990	Mean age 9.3 years

Excluded studies - A2 Are neurosurgical procedures (intrathecal baclofen pump and selective dorsal rhizotomy) effective in adults aged 19 and over with cerebral palsy to reduce spasticity and or dystonia?	
Study	Reason for Exclusion
Bonouvrie, L. A., Becher, J. G., Vles, J. S. H., Boeschoten, K., Soudant, D., de Groot, V., van Ouwkerk, W. J. R., Strijers, R. L. M., Foncke, E., Geytenbeek, J., van de Ven, P. M., Teernstra, O., Vermeulen, R. J., Intrathecal baclofen treatment in dystonic cerebral palsy: A randomized clinical trial: The IDYS trial, <i>BMC Pediatrics</i> , 13, 2013	Trial protocol - see Bonouvrie 2016 for results
Bonouvrie, L., Becher, J., Soudant, D., Buizer, A., Van Ouwkerk, W., Vles, G., Vermeulen, R. J., The effect of intrathecal baclofen treatment on activities of daily life in children and young adults with cerebral palsy and progressive neurological disorders, <i>European Journal of Paediatric Neurology</i> , 20, 538-544, 2016	Mean age at implantation was 12.4 years for those with spastic CP and 16.0 for those with dystonic CP
Borrini, L., Bensmail, D., Thiebaut, J.B., Hugeron, C., Rech, C., Jourdan, C., Occurrence of adverse events in long-term intrathecal baclofen infusion: a 1-year follow-up study of 158 adults, <i>Archives of Physical Medicine and Rehabilitation</i> , 95, 1032-1038, 2014	Minority had CP - results not reported separately
Brennan, P. M., Whittle, I. R., Intrathecal baclofen therapy for neurological disorders: a sound knowledge base but many challenges remain, <i>British Journal of Neurosurgery</i> , 22, 508-19, 2008	expert review
Brochard, S., Lempereur, M., Filipetti, P., Remy-Neris, O., Changes in gait following continuous intrathecal baclofen infusion in ambulant children and young adults with cerebral palsy, <i>Developmental Neurorehabilitation</i> , 12, 397-405, 2009	Only one person aged > 16 years
Broseta, J., Garcia-March, G., Sanchez-Ledesma, M.J., Anaya, J., Silva, I., Chronic intrathecal baclofen administration in severe spasticity, <i>Stereotactic and Functional Neurosurgery</i> , 54-55, 147-153, 1990	Not CP
Burke, D., Dorsal Rhizotomy for Cerebral-Palsy, <i>Muscle & Nerve</i> , 18, 126-127, 1995	Comment on Logigian 1994 study
Butler, C., Campbell, S., Evidence of the effects of intrathecal baclofen for spastic and dystonic cerebral palsy, <i>Developmental Medicine & Child Neurology</i> , 42, 634-645, 2000	Systematic review, outdated
Cahan, L.D., Adams, J.M., Perry, J., Beeler, L.M., Instrumented gait analysis after selective dorsal rhizotomy, <i>Developmental Medicine and Child Neurology</i> , 32, 1037-1043, 1990	Median age 6.5 years.
Caird, M.S., Palanca, A.A., Garton, H., Hensinger, R.N., Ayyangar, R.N., Drongowski, A., Farley, F.A., Outcomes of posterior spinal fusion and instrumentation in patients with continuous intrathecal baclofen infusion pumps, <i>Spine</i> , 33, E94-E99, 2008	Intervention not in protocol
Campbell, W.M., Ferrel, A., McLaughlin, J.F., Grant, G.A., Loeser, J.D., Graubert, C., Bjornson, K., Long-term safety and efficacy of continuous intrathecal baclofen, <i>Developmental Medicine & Child Neurology</i> , 44, 660-665, 2002	Median age 12 years
Cevikol, A., Ecerkale, O., Sancioglu, H., Sorar, M., Cakci, A., Intrathecal Baclofen Therapy Applications: Assessment of Our Cases Between 2004-2012, <i>Turkiye Fiziksel Tip Ve Rehabilitasyon Dergisi-Turkish Journal of Physical Medicine and Rehabilitation</i> , 60, 295-301, 2014	Not CP

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Study	Reason for Exclusion
Clearfield, J. S., Nelson, M. E. S., McGuire, J., Rein, L. E., Tarima, S., Intrathecal Baclofen Dosing Regimens: A Retrospective Chart Review, <i>Neuromodulation</i> , 19, 642-649, 2016	N=5, outcome not in protocol (dosage)
Collin, C., Young, C., Cerebral palsy: The adult perspective, <i>Current Paediatrics</i> , 10, 172-176, 2000	Expert review
Concalves, J., Garcia-March, G., Sanchez-Ledesma, M.J., Onzain, I., Broseta, J., Management of intractable spasticity of supraspinal origin by chronic cervical intrathecal infusion of baclofen, <i>Stereotactic and Functional Neurosurgery</i> , 62, 108-112, 1994	3/11 had CP
Cruikshank, M., Eunson, P., Intravenous diazepam infusion in the management of planned intrathecal baclofen withdrawal, <i>Developmental Medicine & Child Neurology</i> , 49, 626-628, 2007	Intervention not in protocol
de Lissovoy, G., Matza, L. S., Green, H., Werner, M., Edgar, T., Cost-effectiveness of intrathecal baclofen therapy for the treatment of severe spasticity associated with cerebral palsy, <i>Journal of Child Neurology</i> , 22, 49-59, 2007	Cost effectiveness study - children with CP
Delhaas, E.M., Beersen, N., Redekop, W.K., Klazinga, N.S., Long-term outcomes of continuous intrathecal baclofen infusion for treatment of spasticity: A prospective multicenter follow-up study, <i>Neuromodulation</i> , 11, 227-236, 2008	12/115 had CP, no subgroup analysis
Devilliers, J. C., Selective Posterior Rhizotomy in the Treatment of Spasticity, <i>South African Medical Journal</i> , 83, 709-710, 1993	6/23 had CP
Dickerman, R. D., Stevens, Q. E., Schneider, S. J., The role of surgical placement and pump orientation in intrathecal pump system failure: a technical report, <i>Pediatric Neurosurgery</i> , 38, 107-9, 2003	No details about the study population
Duan, Y., Luo, X., Gao, X., Sun, C., Cervical selective dorsal rhizotomy for treating spasticity in upper limb neurosurgical way to neurosurgical technique, <i>Interdisciplinary Neurosurgery: Advanced Techniques and Case Management</i> , 2, 57-60, 2015	Case report
Dudgeon, B.J., Libby, A.K., McLaughlin, J.F., Hays, R.M., Bjornson, K.P., Roberts, T.S., Prospective measurement of functional changes after selective dorsal rhizotomy, <i>Archives of Physical Medicine and Rehabilitation</i> , 75, 46-53, 1994	SDR in childhood
Dudley, R. W. R., Parolin, M., Gagnon, B., Saluja, R. S., Yap, R., Monpetit, K., Ruck, J., Poulin, C., Cantin, M. A., Benaroch, T., Farmer, J. P., Beneficial Functional Outcomes of Selective Dorsal Rhizotomy (SDR) Are Long Lasting and Alter the Natural History of Motor Development in Spastic Cerebral Palsy, <i>Neurosurgery</i> , 71, E564-E565, 2012	Abstract only- SDR in childhood
Eldabe, S., Intrathecal Baclofen Pump Implantation in Prone Position for a Cerebral Palsy Patient With Severe Scoliosis: A Case Report COMMENT, <i>Neuromodulation</i> , 18, 216-216, 2015	Case report
Engsberg, J.R., Ross, S.A., Park, T.S., Changes in ankle spasticity and strength following selective dorsal rhizotomy and physical therapy for spastic cerebral palsy, <i>Journal of Neurosurgery</i> , 91, 727-732, 1999	mean age 12
Ethans, K.D., Schryvers, O.I., Nance, P.W., Casey, A.R., Intrathecal drug therapy using the Codman Model 3000 Constant Flow	1/17 had CP

Excluded studies - A2 Are neurosurgical procedures (intrathecal baclofen pump and selective dorsal rhizotomy) effective in adults aged 19 and over with cerebral palsy to reduce spasticity and or dystonia?	
Study	Reason for Exclusion
Implantable Infusion Pumps: experience with 17 cases, Spinal Cord, 43, 214-218, 2005	
Fares, Y., Khazim, R.M., del Barrio, E.R., Burzaco, J.A., Dosage of intrathecal baclofen maintenance therapy in the spastic syndromes, Journal Medical Libanais - Lebanese Medical Journal, 52, 13-18, 2004	6/23 had CP
Fink, J. K., Fillingkatz, M. R., Barton, N. W., Macrae, P. R., Hallett, M., Cohen, W. E., Treatable Dystonia Presenting as Spastic Cerebral-Palsy, Pediatrics, 82, 137-138, 1988	Case report
Francisco, G.E., The role of intrathecal baclofen therapy in the upper motor neuron syndrome, Europa Medicophysica, 40, 131-143, 2004	Not CP
Gage, J. R., Novacheck, T. F., An update on the treatment of gait problems in cerebral palsy, Journal of Pediatric Orthopaedics-Part B, 10, 265-274, 2001	Expert review
Gelber, D. A., Jozefczyk, P. B., Therapeutics in the management of spasticity, Neurorehabilitation and Neural Repair, 13, 5-14, 1999	Expert review
Gerszten, P.C., Albright, A.L., Johnstone, G.F., Intrathecal baclofen infusion and subsequent orthopedic surgery in patients with spastic cerebral palsy, Journal of Neurosurgery, 88, 1009-1013, 1998	Relevant outcomes not reported
Gilmartin, R. C., Rawlins, P., Seizures in Epileptic Cerebral-Palsy Patients Receiving Intrathecal Baclofen Infusion, Epilepsia, 36, G12-G12, 1995	Abstract only - insufficient detail
Gilmartin, R., Bruce, D., Storrs, B.B., Abbott, R., Krach, L., Ward, J., Bloom, K., Brooks, W.H., Johnson, D.L., Madsen, J.R., McLaughlin, J.F., Nadell, J., Intrathecal baclofen for management of spastic cerebral palsy: multicenter trial, Journal of Child Neurology, 15, 71-77, 2000	Median age 11.2 years
Ginsburg, G.M., Lauder, A.J., Progression of scoliosis in patients with spastic quadriplegia after the insertion of an intrathecal baclofen pump, Spine, 32, 2745-2750, 2007	Most patients were not skeletally mature
Gormley, M. E., Jr., O'Brien, C. F., Yablon, S. A., A clinical overview of treatment decisions in the management of spasticity, Muscle & Nerve Supplement, 6, S14-20, 1997	expert review
Goyal, V., Laisram, N., Wadhwa, R. K., Kothari, S. Y., Prospective randomized study of oral Diazepam and Baclofen on spasticity in cerebral palsy, Journal of Clinical and Diagnostic Research, 10, RC01-RC05, 2016	Oral baclofen in children
Green, C., Proch, C., Gara, S.E., The changing face of cerebral palsy: A review of the disorder and its treatment, Journal of Neurologic Rehabilitation, 11, 245-253, 1997	Expert review
Gump, W. C., Mutchnick, I. S., Moriarty, T. M., Selective dorsal rhizotomy for spasticity not associated with cerebral palsy: reconsideration of surgical inclusion criteria, Neurosurgical Focus, 35, E6, 2013	Not CP
Gunnarsson, S., Samuelsson, K., Patient experiences with intrathecal baclofen as a treatment for spasticity - a pilot study, Disability & Rehabilitation, 37, 834-41, 2015	2/14 had CP, qualitative study

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Study	Reason for Exclusion
Hattori, N., Hirayama, T., Katayama, Y., Cost-Effectiveness Analysis of Intrathecal Baclofen Therapy in Japan, <i>Neurologia Medico-Chirurgica</i> , 52, 482-487, 2012	Not CP
Heimbürger, R.F., Slominski, A., Griswold, P., Cervical posterior rhizotomy for reducing spasticity in cerebral palsy, <i>Journal of Neurosurgery</i> , 39, 30-34, 1973	Median age not reported
Humphreys, R. P., Cost-Analysis of Continuous Intrathecal Baclofen Versus Selective Functional Posterior Rhizotomy in the Treatment of Spastic Quadriplegia Associated with Cerebral-Palsy - Editorial Comment, <i>Pediatric Neurosurgery</i> , 22, 265-265, 1995	Cost effectiveness of ITB in children with CP
Hurvitz, E. A., Marciniak, C. M., Daunter, A. K., Haapala, H. J., Stibb, S. M., McCormick, S. F., Muraszko, K. M., Gaebler-Spira, D., Functional outcomes of childhood dorsal rhizotomy in adults and adolescents with cerebral palsy: Clinical article, <i>Journal of Neurosurgery: Pediatrics</i> , 11, 380-388, 2013	Mean age at SDR 6 years
Hurvitz, E. A., Marciniak, C. M., Muraszko, K. M., Gaebler-Spira, D., Dorsal rhizotomy Response, <i>Journal of Neurosurgery-Pediatrics</i> , 11, 378-379, 2013	Response to editorial on Horvitz 2013
Jones, R.F., Lance, J.W., Baclofen (Lioresal) in the long-term management of spasticity, <i>Medical Journal of Australia</i> , 1, 654-657, 1976	2/113 had CP
Kai, M., Yongjie, L., Ping, Z., Long-term results of selective dorsal rhizotomy for hereditary spastic paraparesis, <i>Journal of Clinical Neuroscience</i> , 21, 116-20, 2014	Not CP
Kamensek, J., Continuous intrathecal baclofen infusions. An introduction and overview, <i>AXON</i> , 20, 67-72, 1999	Expert review
Keating, R. F., Butler, S., DeFreitas, T., Oluigbo, C., Rabin, J., Lavenstein, B., Magge, S., Myseros, J., Indwelling intrathecal baclofen trial: Assessment of efficacy and safety in 124 pediatric patients with cerebral palsy and dystonic overlay, <i>Journal of Neurosurgery</i> , 122 (6), A1573, 2015	Abstract, mean age 13 years
Khan, A. A., Birks-Agnew, I., Bullock, P., Rushton, D., Clinical outcome and complications of intrathecal baclofen pump in multiple sclerosis patients: A retrospective study, <i>NeuroRehabilitation</i> , 27, 117-120, 2010	Not CP
Kim, H.S., Steinbok, P., Wickenheiser, D., Predictors of poor outcome after selective dorsal rhizotomy in treatment of spastic cerebral palsy, <i>Childs Nervous System</i> , 22, 60-66, 2006	Mean age at SDR: 5.5 years
Kishima, H., Yanagisawa, T., Goto, Y., Oshino, S., Maruo, T., Tani, N., Khoo, H. M., Hosomi, K., Hirata, M., Yoshimine, T., Respiratory Function Under Intrathecal Baclofen Therapy in Patients With Spastic Tetraplegia, <i>Neuromodulation</i> , 19, 650-654, 2016	N=2 with CP
Kita, M., Goodkin, D. E., Drugs used to treat spasticity, <i>Drugs</i> , 59, 487-495, 2000	Expert review
Knapp, M. E., Cerebral palsy. 2, <i>Postgraduate Medicine</i> , 47, 247-252, 1970	Expert review

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Study	Reason for Exclusion
Kolaski,K., Logan,L.R., A review of the complications of intrathecal baclofen in patients with cerebral palsy, <i>NeuroRehabilitation</i> , 22, 383-395, 2007	Systematic review
Krach, L., Intrathecal baclofen and motor function in cerebral palsy, <i>Developmental Medicine and Child Neurology</i> , 53, 391-391, 2011	Commentary on Motta 2011
Krach,L.E., Pharmacotherapy of spasticity: Oral medications and intrathecal baclofen, <i>Journal of Child Neurology</i> , 16, 31-36, 2001	Expert review
Krach,L.E., Intrathecal baclofen use in adults with cerebral palsy, <i>Developmental Medicine and Child Neurology</i> , 51, 106-112, 2009	Expert review
Krach,L.E., Kriel,R.L., Day,S.M., Strauss,D.J., Survival of individuals with cerebral palsy receiving continuous intrathecal baclofen treatment: a matched-cohort study, <i>Developmental Medicine and Child Neurology</i> , 52, 672-676, 2010	SDR in childhood CP
Krach,L.E., Kriel,R.L., Gilmartin,R.C., Swift,D.M., Storrs,B.B., Abbott,R., Ward,J.D., Bloom,K.K., Brooks,W.H., Madsen,J.R., McLaughlin,J.F., Nadell,J.M., GMFM 1 year after continuous intrathecal baclofen infusion, <i>Pediatric Rehabilitation</i> , 8, 207-213, 2005	Median age 10.6 years
Krach,L.E., Kriel,R.L., Gilmartin,R.C., Swift,D.M., Storrs,B.B., Abbott,R., Ward,J.D., Bloom,K.K., Brooks,W.H., Madsen,J.R., McLaughlin,J.F., Nadell,J.M., Hip status in cerebral palsy after one year of continuous intrathecal baclofen infusion, <i>Pediatric Neurology</i> , 30, 163-168, 2004	Median age 10
Krach,L.E., Kriel,R.L., Nugent,A.C., Complex Dosing Schedules for Continuous Intrathecal Baclofen Infusion, <i>Pediatric Neurology</i> , 37, 354-359, 2007	Median age at treatment < 15 years
Krach,L.E., Nettleton,A., Klempka,B., Satisfaction of individuals treated long-term with continuous infusion of intrathecal baclofen by implanted programmable pump, <i>Pediatric Rehabilitation</i> , 9, 210-218, 2006	Median age not reported (range 5 to 42 years)
Langerak, N. G., Lamberts, R. P., Fiegggen, A. G., Peter, J. C., van der Merwe, L., Peacock, W. J., Vaughan, C. L., A prospective gait analysis study in patients with diplegic cerebral palsy 20 years after selective dorsal rhizotomy, <i>Journal of Neurosurgery. Pediatrics.</i> , 1, 180-6, 2008	Childhood SDR (at median 5 years)
Langerak, N. G., Vaughan, C. L., Peter, J. C., Fiegggen, A. G., Peacock, W. J., Long-term outcomes of dorsal rhizotomy, <i>Journal of Neurosurgery-Pediatrics</i> , 12, 664-665, 2013	Reply to comment on article
Langerak,N.G., Tam,N., Vaughan,C.L., Fiegggen,A.G., Schwartz,M.H., Gait status 17-26 years after selective dorsal rhizotomy, <i>Gait and Posture</i> , 35, 244-249, 2012	SDR in childhood
Langerak,N.G., Lamberts,R.P., Fiegggen,A.G., Peter,J.C., Peacock,W.J., Vaughan,C.L., Functional Status of Patients With Cerebral Palsy According to the International Classification of Functioning, Disability and Health Model: A 20-Year Follow-Up Study After Selective Dorsal Rhizotomy, <i>Archives of Physical Medicine and Rehabilitation</i> , 90, 994-1003, 2009	Childhood SDR

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Study	Reason for Exclusion
Lapeyre, E., Kuks, J. B. M., Meijler, A. J., Spasticity: Revisiting the role and the individual value of several pharmacological treatments, <i>NeuroRehabilitation</i> , 27, 193-200, 2010	Expert review
Latash, M.L., Penn, R.D., Changes in voluntary motor control induced by intrathecal baclofen in patients with spasticity of different etiology, <i>Physiotherapy Research International</i> , 1, 229-246, 1996	N=2 with CP
Lazorthes, Y. R., Continuous Intrathecal Baclofen Infusion in the treatment of spastic cerebral palsy: A prospective multicenter study, <i>Neurosurgery</i> , 59, 484-484, 2006	Abstract only, age 6-8 years
Lazorthes, Y., Sallerin-Caute, B., Verdie, J.C., Bastide, R., Carillo, J.P., Chronic intrathecal baclofen administration for control of severe spasticity, <i>Journal of Neurosurgery</i> , 72, 393-402, 1990	1/18 had CP
Leary, S. M., Gilpin, P., Lockley, L., Rodriguez, L., Jarett, L., Stevenson, V. L., Intrathecal baclofen therapy improves functional intelligibility of speech in cerebral palsy, <i>Clinical Rehabilitation</i> , 20, 228-231, 2006	Case report
Leland Albright, A., Barry, M. J., Shafron, D. H., Ferson, S. S., Intrathecal baclofen for generalized dystonia, <i>Developmental Medicine and Child Neurology</i> , 43, 652-657, 2001	median age 13
Levy, R. M., The Failed and Future Promise of Intraspinal Drug Administration for Neurologic Disorders, <i>Neuromodulation</i> , 15, 165-170, 2012	Expert review
McCormick, Z. L., Chu, S. K., Binler, D., Neudorf, D., Mathur, S. N., Lee, J., Marciniak, C., Intrathecal Versus Oral Baclofen: A Matched Cohort Study of Spasticity, Pain, Sleep, Fatigue, and Quality of Life, <i>PM and R</i> , 8, 553-562, 2016	10/62 had CP - results not reported separately
McLaughlin, J., Motor function after dorsal rhizotomy, <i>Developmental Medicine and Child Neurology</i> , 54, 389-390, 2012	Editorial
McLaughlin, J. F., Bjornson, K. F., Astley, S. J., Hays, R. M., Hoffinger, S. A., Roberts, T. S., Selective Dorsal Rhizotomy in Spastic Cerebral-Palsy - Critical-Evaluation of a Prospective Series, <i>Pediatric Research</i> , 35, A383-A383, 1994	Abstract only, SDR in children
McLaughlin, Jf, Bjornson, Kf, Astley, Sj, Hays, Rm, Hoffinger, Sa, Armantrout, Ea, Roberts, Ts, The role of selective dorsal rhizotomy in cerebral palsy: critical evaluation of a prospective clinical series, <i>Developmental Medicine and Child Neurology</i> , 36, 755-69, 1994	Expert review
Mess, S.A., Kim, S., Davison, S., Heckler, F., Implantable baclofen pump as an adjuvant in treatment of pressure sores, <i>Annals of Plastic Surgery</i> , 51, 465-467, 2003	Case report
Meythaler, J.M., Guin-Renfroe, S., Hadley, M.N., Continuously infused intrathecal baclofen for spastic/dystonic hemiplegia: a preliminary report, <i>American Journal of Physical Medicine and Rehabilitation</i> , 78, 247-254, 1999	Not CP
Misbahuddin, A., Warner, T. T., Dystonia: an update on genetics and treatment, <i>Current Opinion in Neurology/Curr Opin Neurol</i> , 14, 471-5, 2001	Expert review

Excluded studies - A2 Are neurosurgical procedures (intrathecal baclofen pump and selective dorsal rhizotomy) effective in adults aged 19 and over with cerebral palsy to reduce spasticity and or dystonia?	
Study	Reason for Exclusion
Mohammed,I., Hussain,A., Intrathecal baclofen withdrawal syndrome- a life-threatening complication of baclofen pump: a case report, BMC Clinical Pharmacology, 4, 6-, 2004	Case report
Mooney, J. F., Koman, L. A., Smith, B. P., Pharmacologic management of spasticity in cerebral palsy, Journal of Pediatric Orthopaedics, 23, 679-686, 2003	Expert review
Morota,N., Abbott,R., Kofler,M., Epstein,F.J., Cohen,H., Residual spasticity after selective posterior rhizotomy, Child's Nervous System, 11, 161-165, 1995	Mean age 6
Morr, S., Heard, C. M., Li, V., Reynolds, R. M., Dexmedetomidine for Acute Baclofen Withdrawal, Neurocritical Care, 22, 288-292, 2015	Case report
Nakou, V., Perides, S., Lundy, C., Mackin, G., Tustin, K., Gimeno, H., Baker, L., Lumsden, D. E., Selway, R., Ashkan, K., Bassi, S., Lin, J. P., Kaminska, M., Heterogeneity of movement disorders in hypomyelination with atrophy of the basal ganglia (H-ABC) syndrome and their management with Deep Brain Stimulation (DBS) or Intrathecal Baclofen Pump (ITB), Developmental Medicine and Child Neurology, 59, 11-12, 2017	Not CP
Neville, B. G., Selective dorsal rhizotomy for spastic cerebral palsy, Developmental Medicine & Child Neurology Dev Med Child Neurol, 30, 395-8, 1988	Expert review
O'Donnell,M., Armstrong,R., Pharmacologic interventions for management of spasticity in cerebral palsy, Mental Retardation and Developmental Disabilities Research Reviews, 3, -211, 1997	Expert review
Olree,K.S., Engsborg,J.R., Ross,S.A., Park,T.S., Changes in synergistic movement patterns after selective dorsal rhizotomy, Developmental Medicine and Child Neurology, 42, 297-303, 2000	mean age 6.7
Oppenheim, W. L., Selective Posterior Rhizotomy for Spastic Cerebral-Palsy - a Review, Clinical Orthopaedics and Related Research, 20-29, 1990	Expert review
Park, T. S., Cost-Analysis of Continuous Intrathecal Baclofen Versus Selective Functional Posterior Rhizotomy in the Treatment of Spastic Quadriplegia Associated with Cerebral-Palsy - Editorial Comment, Pediatric Neurosurgery, 22, 265-265, 1995	Cost effectiveness of ITB in children
Peacock, W. J., Arens, L. J., Selective Posterior Rhizotomy for the Relief of Spasticity in Cerebral-Palsy, South African Medical Journal, 62, 119-124, 1982	SDR in children
Peacock, W. J., Staudt, L. A., Spasticity in Cerebral-Palsy and the Selective Posterior Rhizotomy Procedure, Journal of Child Neurology, 5, 179-185, 1990	SDR in children
Peacock,W.J., Arens,L.J., Berman,B., Cerebral palsy spasticity. Selective posterior rhizotomy, Pediatric Neuroscience, 13, 61-66, 1987	Expert review
Penn,R.D., Gianino,J.M., York,M.M., Intrathecal baclofen for motor disorders, Movement Disorders, 10, 675-677, 1995	N=2 with CP
Perez-Arredondo, A., Cazares-Ramirez, E., Carrillo-Mora, P., Martinez-Vargas, M., Cardenas-Rodriguez, N., Coballase-Urrutia, E.,	Expert review

Excluded studies - A2 Are neurosurgical procedures (intrathecal baclofen pump and selective dorsal rhizotomy) effective in adults aged 19 and over with cerebral palsy to reduce spasticity and or dystonia?	
Study	Reason for Exclusion
Alemon-Medina, R., Sampieri, A., Navarro, L., Carmona-Aparicio, L., Baclofen in the Therapeutic of Sequele of Traumatic Brain Injury: Spasticity, <i>Clinical Neuropharmacology</i> , 39, 311-319, 2016	
Peter, J.C., Arens, L.J., Selective posterior lumbosacral rhizotomy for the management of cerebral palsy spasticity. A 10-year experience, <i>South African Medical Journal, Suid-Afrikaanse Tydskrif Vir Geneeskunde</i> . 83, 745-747, 1993	Median age < 12 years
Peter, J.C., Arens, L.J., Selective posterior lumbosacral rhizotomy in teenagers and young adults with spastic cerebral palsy, <i>British Journal of Neurosurgery</i> , 8, 135-139, 1994	Median age < 15 years
Pin, T. W., McCartney, L., Lewis, J., Waugh, M. C., Use of intrathecal baclofen therapy in ambulant children and adolescents with spasticity and dystonia of cerebral origin: a systematic review, <i>Developmental Medicine & Child Neurology</i> , 53, 885-95, 2011	Systematic review (checked for relevant studies)
Plassat, R., Verbe, B. P., Menei, P., Menegalli, D., Mathe, J. F., Richard, I., Treatment of spasticity with intrathecal baclofen administration: long-term follow-up, review of 40 patients, <i>Spinal Cord</i> , 42, 686-693, 2004	3/41 had CP
Rappaport, Z. H., Limited (L4-S1, L5-S1) selective dorsal rhizotomy for reducing spasticity in cerebral palsy - Comment, <i>Acta Neurochirurgica</i> , 141, 751-752, 1999	Comment on Lazareff 1999
Rawicki, B., Treatment of cerebral origin spasticity with continuous intrathecal baclofen delivered via an implantable pump: long-term follow-up review of 18 patients, <i>Journal of Neurosurgery</i> , 91, 733-736, 1999	3/18 had CP
Rawlins, P., Intrathecal baclofen for spasticity of cerebral palsy: project coordination and nursing care, <i>Journal of Neuroscience Nursing</i> , 27, 157-163, 1995	Describes nursing organisation
Rawlins, P.K., Intrathecal baclofen therapy over 10 years, <i>Journal of Neuroscience Nursing</i> , 36, 322-327, 2004	Mean age at implant 13.3 years, N=18
Remy-Neris, O., Tiffreau, V., Bouilland, S., Bussel, B., Intrathecal baclofen in subjects with spastic hemiplegia: Assessment of the antispastic effect during gait, <i>Archives of Physical Medicine and Rehabilitation</i> , 84, 643-650, 2003	N=1 with CP
Russman, B. S., Intrathecal baclofen, <i>Developmental Medicine and Child Neurology</i> , 52, 601-602, 2010	Includes > 50% of patients without CP (including MS and degenerative disease)
Salame, K., Ouaknine, G.E., Rochkind, S., Constantini, S., Razon, N., Surgical treatment of spasticity by selective posterior rhizotomy: 30 years experience, <i>Israel Medical Association Journal: Imaj</i> , 5, 543-546, 2003	60/152 had CP - not reported separately
Saltuari, L., Kronenberg, M., Marosi, M.J., Kofler, M., Russegger, L., Rifici, C., Bramanti, P., Gerstenbrand, F., Long-term intrathecal baclofen treatment in supraspinal spasticity, <i>Acta Neurologica</i> , 14, 195-207, 1992	Not CP

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Study	Reason for Exclusion
Sampson, F. C., Hayward, A., Evans, G., Morton, R., Collett, B., Functional benefits and cost/benefit analysis of continuous intrathecal baclofen infusion for the management of severe spasticity, <i>Journal of Neurosurgery</i> , 96, 1052-1057, 2002	Cost effectiveness study - not CP
Sansone, J.M., Mann, D., Noonan, K., Mcleish, D., Ward, M., Iskandar, B.J., Rapid progression of scoliosis following insertion of intrathecal baclofen pump, <i>Journal of Pediatric Orthopedics</i> , 26, 125-128, 2006	N=4, case series
Saulino, M., Anderson, D. J., Doble, J., Farid, R., Gul, F., Konrad, P., Boster, A. L., Best Practices for Intrathecal Baclofen Therapy: Troubleshooting, <i>Neuromodulation</i> , 19, 632-641, 2016	Consensus guideline
Saval, A., Chiodo, A.E., Intrathecal baclofen for spasticity management: a comparative analysis of spasticity of spinal vs cortical origin, <i>Journal of Spinal Cord Medicine</i> , 33, 16-21, 2010	7/57 had CP
Saval, A., Chiodo, A.E., Effect of intrathecal baclofen concentration on spasticity control: case series, <i>Journal of Spinal Cord Medicine</i> , 31, 394-397, 2008	1/3 had CP, case reports
Schijman, E., Erro, M.G., Meana, N.V., Selective posterior rhizotomy: Experience of 30 cases, <i>Child's Nervous System</i> , 9, 474-477, 1993	Insufficient detail about the population
Schmidt, E., DiMario, F. J., Efficacy profile for anti-spasticity therapies in cerebral palsy, <i>Journal of Investigative Medicine</i> , 47, 165A-165A, 1999	Abstract only, paediatric study
Schmit, B.D., Gaebler-Spira, D., Mechanical measurements of the effects of intrathecal baclofen dosage adjustments in cerebral palsy: a pilot study, <i>American Journal of Physical Medicine and Rehabilitation</i> , 83, 33-41, 2004	Case series, N=6
Shilt, Js, Lai, Lp, Cabrera, Mn, Frino, J, Smith, Bp, The impact of intrathecal baclofen on the natural history of scoliosis in cerebral palsy, <i>Journal of pediatric orthopedics</i> , 28, 684-7, 2008	Mean age 9.8
Siegfried, J., Rea, G.L., Intrathecal application of baclofen in the treatment of spasticity, <i>Acta Neurochirurgica - Supplementum</i> , 39, 121-123, 1987	1/9 had CP
Silva, S., Nowicki, P., Caird, M. S., Hurvitz, E. A., Ayyangar, R. N., Farley, F. A., Vanderhave, K. L., Hensinger, R. N., Craig, C. L., A comparison of hip dislocation rates and hip containment procedures after selective dorsal rhizotomy versus intrathecal baclofen pump insertion in nonambulatory cerebral palsy patients, <i>Journal of Pediatric Orthopedics</i> , 32, 853-6, 2012	Mean age <10
Sindou, M., Limited (L4-S1, L5-S1) selective dorsal rhizotomy for reducing spasticity in cerebral palsy - Comment, <i>Acta Neurochirurgica</i> , 141, 751-752, 1999	SDR in children < 12 with CP.
Sindou, M., Mifsud, J.J., Boisson, D., Goutelle, A., Selective posterior rhizotomy in the dorsal root entry zone for treatment of hyperspasticity and pain in the hemiplegic upper limb, <i>Neurosurgery</i> , 18, 587-595, 1986	Not CP
Speelman, J.D., Treatment strategies in movement disorders, <i>Journal of Inherited Metabolic Disease</i> , 28, 441-444, 2005	Case report

Excluded studies - A2 Are neurosurgical procedures (intrathecal baclofen pump and selective dorsal rhizotomy) effective in adults aged 19 and over with cerebral palsy to reduce spasticity and or dystonia?	
Study	Reason for Exclusion
Spiegel,D.A., Flynn,J.M., Evaluation and Treatment of Hip Dysplasia in Cerebral Palsy, Orthopedic Clinics of North America, 37, 185-196, 2006	Expert review
Steinbok, P., Outcomes after selective dorsal rhizotomy, Developmental Medicine and Child Neurology, 57, 214-215, 2015	Comment on another study (Josenby 2015)
Steinbok,P., 10-year follow-up after selective dorsal rhizotomy in cerebral palsy, Developmental Medicine and Child Neurology, 53, 678-678, 2011	Comment on another study (Tedroff 2011)
Stempien,L., Tsai,T., Intrathecal baclofen pump use for spasticity: A clinical survey, American Journal of Physical Medicine and Rehabilitation, 79, 536-541, 2000	Age < 9
Stokic, D. S., Yablon, S. A., Hayes, A., Vesovic-Potic, V., Olivier, J., Dose-response relationship between the H-reflex and continuous intrathecal baclofen administration for management of spasticity, Clinical Neurophysiology, 117, 1283-1289, 2006	4/34 had CP
Sweetser, P. M., Badell, A., Schneider, S., Badlani, G. H., Effects of Sacral Dorsal Rhizotomy on Bladder Function in Patients with Spastic Cerebral-Palsy, Neurourology and Urodynamics, 14, 57-64, 1995	Median age < 10
Taira, T., Hori, T., Intrathecal baclofen therapy, Neurological Surgery, 36, 573-590, 2008	Japanese language
Tasseel-Ponche, S., Intrathecal baclofen in cerebral palsy. A retrospective study of 25 wheelchair-assisted adults, Annals of Physical and Rehabilitation Medicine, 54, e16, 2011	Abstract only - see Tasseel 2010 for full text
Thakur, S. K., Rubin, B. A., Harter, D. H., Long-term follow-up for lumbar intrathecal baclofen catheters placed using the paraspinous subfascial technique, Journal of Neurosurgery: Pediatrics, 17, 357-360, 2016	Insufficient detail about the population
Tichy,M., Kraus,J., Horinek,D., Vaculik,M., Selective posterior rhizotomy in the treatment of cerebral palsy, first experience in Czech Republic, Bratislavske Lekarske Listy, 104, 54-58, 2003	Median age < 16
Trost,J.P., Schwartz,M.H., Krach,L.E., Dunn,M.E., Novacheck,T.F., Comprehensive short-term outcome assessment of selective dorsal rhizotomy, Developmental Medicine and Child Neurology, 50, 765-771, 2008	Mean age 7 years
Vogt, T., Urban, P. P., Optimising therapy for spastic syndrome by combining baclofen with botulinumtoxin, Nervenarzt, 71, 1007-1011, 2000	Case report, German language
Walker, R. H., Danisi, F. O., Swope, D. M., Goodman, R. R., Germano, I. M., Brin, M. F., Intrathecal baclofen for dystonia: Benefits and complications during six years of experience, Movement Disorders, 15, 1242-1247, 2000	Not CP
Xu,L., Hong,Y., Wang,A.Q., Wang,Z.X., Tang,T., Hyperselective posterior rhizotomy in treatment of spasticity of paralytic limbs, Chinese Medical Journal, 106, 671-673, 1993	Mean / median age of subjects not reported
Zierski,J., Muller,H., Dralle,D., Wurdinger,T., Implanted pump systems for treatment of spasticity, Acta Neurochirurgica - Supplementum, 43, 94-99, 1988	3/30 had CP

CP: cerebral palsy; ITB: intrathecal baclofen; N: number of participants in study; SDR: selective dorsal rhizotomy