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## Interventions and Management

### 1. Arch Oral Biol. 2016 Sep 1;73:16-20. doi: 10.1016/j.archoralbio.2016.08.035. [Epub ahead of print]

Differences between the activity of the masticatory muscles of adults with cerebral palsy and healthy individuals while at rest and in function.

Matsui MY, Giannasi LC, Batista SR, Amorim JB, Oliveira CS, Oliveira LV, Gomes MF.

**OBJECTIVE:** The aim of the present study was to compare the electromyographic activity of masticatory muscles of adult patients with different degrees of oral motor impairment (cerebral palsy) with the electromyographic activity of healthy individuals in a control group. Electromyographic activity was compared when the masticatory muscles were at rest and in motion. **DESIGN:** Thirty adult patients with cerebral palsy and 30 subjects without neuromotor disorders were enrolled in the present study. Oral motor function impairment was classified for each subject according to the Orofacial Motor Function Assessment Scale. Surface electromyography was bilaterally recorded in the masseter and anterior temporalis muscles at rest, during maximal voluntary clench and mouth opening. Comparisons between the groups were statistically assessed using Mann-Whitney test. **RESULTS:** At rest and mouth opening, electromyographic values were higher among patients with cerebral palsy than control group. During maximal voluntary clench, the opposite occurred. The degree of oral motor impairment affected mouth opening. **CONCLUSION:** There are significant differences in masticatory muscle activity between adult patients with CP and healthy individuals, and the degree of oral motor impairment is important. **SIGNIFICANCE:** To improve the masticatory function of these patients, muscle therapy should approach rest, mouth opening and clenching differently.

[PMID: 27648849](#)

### 2. Anesth Pain Med. 2016 Mar 12;6(3):e33031. doi: 10.5812/aapm.33031. eCollection 2016.

Intrathecal Baclofen Pump Migration Into the Peritoneal Cavity: A Case Report.

Kovanda TJ, Pestereva E, Lee A.

**INTRODUCTION:** Intrathecal baclofen pumps are valuable treatment options for those with cerebral palsy. Although subfascial baclofen pump placement is generally preferred over a subcutaneous pump placement due to lower infection rates, rare complications can occur with the subfascial approach such as pump migration. **CASE PRESENTATION:** The authors here describe a case of baclofen pump migration into the peritoneal cavity of a 26-year-old male patient with cerebral palsy, shunted hydrocephalus, and epilepsy. Because the patient's pump could not be palpated on exam and hence refilled, imaging was undertaken, but did not reveal clear evidence of pump migration. Surgery afterward confirmed that the pump had migrated into the peritoneal cavity through a fascial defect. Baclofen pump had to be replaced instead subcutaneously as well as the patient later had to be readmitted for 2 ventriculoperitoneal shunt revisions due to progression of his hydrocephalus. **CONCLUSIONS:** Intraperitoneal migration of a subfascially placed baclofen pump is a rare, yet serious complication, which

has been reported only once in the literature. We advise neurosurgeons to have a low level of threshold in confirming the location of a baclofen pump with imaging and surgical exploration if necessary in order to avoid detrimental outcomes such as bowel perforation.

[PMID: 27642571](#)

### 3. *Am J Phys Med Rehabil.* 2016 Sep 22. [Epub ahead of print]

Effects of an Off-Axis Pivoting Elliptical Training Program on Gait Function in Persons With Spastic Cerebral Palsy: A Preliminary Study.

Tsai LC, Ren Y, Gaebler-Spira DJ, Revivo GA, Zhang LQ.

This preliminary study examined the effects of off-axis elliptical training on reducing transverse-plane gait deviations and improving gait function in 8 individuals with cerebral palsy (CP) ( $15.5 \pm 4.1$  years) who completed an training program using a custom-made elliptical trainer that allows transverse-plane pivoting of the footplates during exercise. Lower-extremity off-axis control during elliptical exercise was evaluated by quantifying the root-mean-square and maximal angular displacement of the footplate pivoting angle. Lower-extremity pivoting strength was assessed. Gait function and balance were evaluated using 10-m walk test, 6-minute-walk test, and Pediatric Balance Scale. Toe-in angles during gait were quantified. Participants with CP demonstrated a significant decrease in the pivoting angle (root mean square and maximal angular displacement; effect size, 1.00-2.00) and increase in the lower-extremity pivoting strength (effect size = 0.91-1.09) after training. Reduced 10-m walk test time ( $11.9 \pm 3.7$  seconds vs.  $10.8 \pm 3.0$  seconds;  $P = 0.004$ ; effect size = 1.46), increased Pediatric Balance Scale score ( $43.6 \pm 12.9$  vs.  $45.6 \pm 10.8$ ;  $P = 0.042$ ; effect size = 0.79), and decreased toe-in angle ( $3.7 \pm 10.5$  degrees vs.  $0.7 \pm 11.7$  degrees;  $P = 0.011$ ; effect size = 1.22) were observed after training. We present an intervention to challenge lower-extremity off-axis control during a weight-bearing and functional activity for individuals with CP. Our preliminary findings suggest that this intervention was effective in enhancing off-axis control, gait function, and balance and reducing in-toeing gait in persons with CP.

[PMID: 27661216](#)

### 4. *Sci Rep.* 2016 Sep 23;6:33807. doi: 10.1038/srep33807.

Using an Artificial Neural Bypass to Restore Cortical Control of Rhythmic Movements in a Human with Quadriplegia.

Sharma G, Friedenberg DA, Annetta N, Glenn B, Bockbrader M, Majstorovic C, Domas S, Mysiw WJ, Rezai A, Bouton C.

Neuroprosthetic technology has been used to restore cortical control of discrete (non-rhythmic) hand movements in a paralyzed person. However, cortical control of rhythmic movements which originate in the brain but are coordinated by Central Pattern Generator (CPG) neural networks in the spinal cord has not been demonstrated previously. Here we show a demonstration of an artificial neural bypass technology that decodes cortical activity and emulates spinal cord CPG function allowing volitional rhythmic hand movement. The technology uses a combination of signals recorded from the brain, machine-learning algorithms to decode the signals, a numerical model of CPG network, and a neuromuscular electrical stimulation system to evoke rhythmic movements. Using the neural bypass, a quadriplegic participant was able to initiate, sustain, and switch between rhythmic and discrete finger movements, using his thoughts alone. These results have implications in advancing neuroprosthetic technology to restore complex movements in people living with paralysis.

[PMID: 27658585](#)

### 5. *Gait Posture.* 2016 Sep 8;50:223-228. doi: 10.1016/j.gaitpost.2016.09.004. [Epub ahead of print]

Long-term changes in femoral anteversion and hip rotation following femoral derotational osteotomy in children with cerebral palsy.

Boyer E, Novacheck TF, Rozumalski A, Schwartz MH.

**BACKGROUND:** Excessive femoral anteversion is common in cerebral palsy (CP), is often associated with internal hip rotation during gait, and is frequently treated with a femoral derotational osteotomy (FDO). Concerns exist regarding long-term maintenance of surgical outcomes. Past studies report varying rates of recurrence, but none have employed a control group. 2

**METHODS:** We conducted a retrospective analysis examining long-term (~5 years) changes in anteversion and hip rotation following FDO in children with CP. We included a control group that was matched for age and exhibited excessive anteversion ( $>30^\circ$ ) but did not undergo an FDO. Anteversion, mean stance hip rotation, and rates of problematic remodeling and recurrence were assessed ( $>15^\circ$  change and final level outside of normal limits). **RESULTS:** The control group was reasonably well matched, but exhibited  $9^\circ$  less anteversion and  $3^\circ$  less internal hip rotation at the pre time point. At a five year follow-up, the FDO group had less anteversion than the control group ( $20^\circ$  vs.  $35^\circ$ ,  $p<0.05$ ). The mean stance phase hip rotation did not differ between the groups ( $4^\circ$  vs.  $5^\circ$ ,  $p=0.17$ ). Over one third of limbs remained excessively internal in both groups (FDO: 34%, Control: 37%). Rates of problematic recurrence and remodeling were low (0%-11%). **CONCLUSIONS:** An FDO is an effective way to correct anteversion in children with CP. Long-term hip rotation is not fully corrected by the procedure, and is not superior to a reasonably well matched control group. Rates of problematic recurrence and remodeling are low, and do not differ between the groups.

[PMID: 27653149](#)

## 6. *J Mot Behav.* 2016 Sep 20:1-8. [Epub ahead of print]

Effect of Transcranial Direct Current Stimulation Combined With Virtual Reality Training on Balance in Children With Cerebral Palsy: A Randomized, Controlled, Double-Blind, Clinical Trial.

Lazzari RD, Politti F, Belina SF, Collange Grecco LA, Santos CA, Dumont AJ, Lopes JB, Cimolin V, Galli M, Santos Oliveira C.

The authors' aim was to investigate the effects of continuous transcranial direct current stimulation (tDCS) combined with virtual reality training on static and functional balance in children with cerebral palsy (CP). Twenty children with CP (6 girls and 14 boys; M age = 7 years 6 months  $\pm$  2 years) were randomly allocated to two groups. The experimental group received active tDCS and the control group received sham stimulation during the 10 sessions of virtual reality mobility training protocols. The children were evaluated on 3 occasions (preintervention, postintervention, and 1-month follow-up). Static balance was evaluated using a force plate under 4 conditions: feet on force plate with (a) eyes open and (b) with eyes closed, and feet on foam mat with (c) eyes open and (d) with eyes closed. Functional balance was evaluated using the Pediatric Balance Scale and the Timed Up and Go Test. The analyses demonstrated statistically significant postintervention and follow-up effects favoring the experimental group over the control group with regard to the Pediatric Balance Scale, Timed Up and Go Test, and area of oscillation of the center of pressure when standing on the force plate with eyes open. The present findings suggest that tDCS can potentiate the effects of virtual reality training on static and functional balance among children with CP.

[PMID: 27644454](#)

## 7. *Neural Plast.* 2016;2016:5020348. doi: 10.1155/2016/5020348. Epub 2016 Aug 29.

Kinematic and EMG Responses to Pelvis and Leg Assistance Force during Treadmill Walking in Children with Cerebral Palsy.

Wu M, Kim J, Arora P, Gaebler-Spira DJ, Zhang Y.

Treadmill training has been used for improving locomotor function in children with cerebral palsy (CP), but the functional gains are relatively small, suggesting a need to improve current paradigms. The understanding of the kinematic and EMG responses to forces applied to the body of subjects during treadmill walking is crucial for improving current paradigms. The objective of this study was to determine the kinematics and EMG responses to the pelvis and/or leg assistance force. Ten children with spastic CP were recruited to participate in this study. A controlled assistance force was applied to the pelvis and/or legs during stance and swing phase of gait through a custom designed robotic system during walking. Muscle activities and spatial-temporal gait parameters were measured at different loading conditions during walking. In addition, the spatial-temporal gait parameters during overground walking before and after treadmill training were also collected. Applying pelvis assistance improved step height and applying leg assistance improved step length during walking, but applying leg assistance also reduced muscle activation of ankle flexor during the swing phase of gait. In addition, step length and self-selected walking speed significantly improved after one session of treadmill training with combined pelvis and leg assistance.

[PMID: 27651955](#)

**8. *Pediatr Phys Ther.* 2016 Winter;28(4):475-82. doi: 10.1097/PEP.0000000000000318.**

Effect of Playground Environments on the Physical Activity of Children With Ambulatory Cerebral Palsy.

Pratt B, Hartshorne NS, Mullens P, Schilling ML, Fuller S, Pisani E.

**PURPOSE:** To compare the effect of 2 different playground environments on the physical activity of children with ambulatory cerebral palsy during their playground play. **METHODS:** Five 7- to 8-year-old children with cerebral palsy (Gross Motor Functional Classification System [GMFCS] level II) participated. Using an alternating treatment, single-subject design, stride patterns were obtained using an activity monitor on an Americans with Disabilities Act (ADA)-compliant and noncompliant playground. Visual and statistical analysis of the stride data was used to analyze the effect of the playground environments. **RESULTS:** Four of the 5 participants increased the number of strides on an ADA-compliant playground. **CONCLUSION:** Children with cerebral palsy (GMFCS II) may benefit from an ADA-compliant playground to increase their physical activity.

[PMID: 27661247](#)

**9. *Pediatr Phys Ther.* 2016 Winter;28(4):482. doi: 10.1097/PEP.0000000000000321.**

Commentary on "Effect of Playground Environments on the Physical Activity of Children With Ambulatory Cerebral Palsy".

Menz SM.

[No abstract available]

[PMID: 27661248](#)

**10. *Pediatr Phys Ther.* 2016 Winter;28(4):427-34. doi: 10.1097/PEP.0000000000000291.**

Validation of Accelerometer Cut-Points in Children With Cerebral Palsy Aged 4 to 5 Years.

Keawutan P, Bell KL, Oftedal S, Davies PS, Boyd RN.

**PURPOSE:** To derive and validate triaxial accelerometer cut-points in children with cerebral palsy (CP) and compare these with previously established cut-points in children with typical development. **METHODS:** Eighty-four children with CP aged 4 to 5 years wore the ActiGraph during a play-based gross motor function measure assessment that was video-taped for direct observation. Receiver operating characteristic and Bland-Altman plots were used for analyses. **RESULTS:** The ActiGraph had good classification accuracy in Gross Motor Function Classification System (GMFCS) levels III and V and fair classification accuracy in GMFCS levels I, II, and IV. These results support the use of the previously established cut-points for sedentary time of 820 counts per minute in children with CP aged 4 to 5 years across all functional abilities. **CONCLUSIONS:** The cut-point provides an objective measure of sedentary and active time in children with CP. The cut-point is applicable to group data but not for individual children.

[PMID: 27661235](#)

**11. *Pediatr Phys Ther.* 2016 Winter;28(4):434. doi: 10.1097/PEP.0000000000000309.**

Commentary on "Validation of Accelerometer Cut-Points in Children With Cerebral Palsy Aged 4 to 5 Years".

Javier G, Lona M, Hamilton D.

[No abstract available]

[PMID: 27661236](#)

**12. *Pediatr Phys Ther.* 2016 Winter;28(4):401-8. doi: 10.1097/PEP.0000000000000301.**

Reliability and Responsiveness of the Timed Up and Go Test in Children With Cerebral Palsy.

Carey H, Martin K, Combs-Miller S, Heathcock JC.

**PURPOSE:** The purpose of this study was to determine the absolute reliability and responsiveness of the Timed Up and Go (TUG) test, as measured using minimal detectable change (MDC) and minimal clinical important difference (MCID) values. **METHODS:** Prospective observational study of children aged 3 to 10 years with cerebral palsy (CP) in Gross Motor Function Classification System levels I-III who completed the TUG test. Minimal detectable change estimates were calculated using baseline data. MCID estimates for each Gross Motor Function Classification System (GMFCS) level were calculated using distribution- and anchor-based methods. **RESULTS:** Minimal detectable change values ranged from 1.40 to 8.74 seconds and MCID estimates ranged from 0.22 to 5.31 seconds. **CONCLUSIONS:** The TUG test is a reliable and responsive measure of balance and mobility for children with CP between 3 and 10 years of age in GMFCS levels I-III. Study results support improved use of the TUG test in clinical and research settings by providing reliability values and estimates of meaningful change.

[PMID: 27661230](#)

**13. *Pediatr Phys Ther.* 2016 Winter;28(4):408. doi: 10.1097/PEP.0000000000000311.**

Commentary on "Reliability and Responsiveness of the Timed Up and Go Test in Children With Cerebral Palsy".

Muir NB, Molloy T.

[PMID: 27661231](#)

**14. *Pediatr Phys Ther.* 2016 Winter;28(4):400. doi: 10.1097/PEP.0000000000000307.**

Commentary on "Influence of External Visual Focus on Gait in Children With Bilateral Cerebral Palsy".

Macias-Merlo L.

[No abstract available]

[PMID: 27661229](#)

**15. *Brain Topogr.* 2016 Sep 17. [Epub ahead of print]**

Altered Resting-State EEG Microstate Parameters and Enhanced Spatial Complexity in Male Adolescent Patients with Mild Spastic Diplegia.

Gao F, Jia H, Wu X, Yu D, Feng Y.

The aim of this study was to investigate the resting-state EEG microstate parameters and spatial complexity in male adolescent patients with mild spastic diplegia (MSD). Resting-state EEG data were collected from male adolescent patients with MSD and healthy controls with eyes closed. EEG microstate and omega complexity analysis were performed. Microstate analysis revealed that the occurrence rate of microstate class A and D were significantly higher and the duration of microstate class B was significantly lower in the patients compared to healthy controls, which indicated that the temporal complexity may be higher and certain cognitive functions may be impaired in these patients. Omega complexity analysis showed that the global omega complexity of alpha-2 band was significantly higher in the patients than the controls. Besides, compared to the anterior regional omega complexities, the posterior regional omega complexities were significantly lower in the delta, theta, alpha-1

and alpha-2 bands, but significantly higher in the beta-2 and gamma-1 bands. And the regional omega complexities in the delta, theta and alpha-1 bands were significantly higher in the patients than controls. The present study reveals that in male adolescent patients with MSD, the temporal and spatial complexities of EEG signal are enhanced, which may be closely associated with the altered brain functions in these patients.

[PMID: 27640158](#)

**16. Eur J Paediatr Neurol. 2016 Sep 6. pii: S1090-3798(16)30145-3. doi: 10.1016/j.ejpn.2016.08.011. [Epub ahead of print]**

What parents think and feel about deep brain stimulation in paediatric secondary dystonia including cerebral palsy: A qualitative study of parental decision-making.

Austin A, Lin JP, Selway R, Ashkan K, Owen T.

**BACKGROUND:** Dystonia is characterised by involuntary movements and postures. Deep Brain Stimulation (DBS) is effective in reducing dystonic symptoms in primary dystonia in childhood and to lesser extent in secondary dystonia. How families and children decide to choose DBS surgery has never been explored. **AIMS:** To explore parental decision-making for DBS in paediatric secondary dystonia. **METHODS:** Data was gathered using semi-structured interviews with eight parents of children with secondary dystonia who had undergone DBS. Interviews were analysed using Interpretative Phenomenological Analysis. **RESULTS:** For all parents the decision was viewed as significant, with life altering consequences for the child. These results suggested that parents were motivated by a hope for a better life and parental duty. This was weighed against consideration of risks, what the child had to lose, and uncertainty of DBS outcome. Decisions were also influenced by the perspectives of their child and professionals. **CONCLUSIONS:** The decision to undergo DBS was an ongoing process for parents, who ultimately were struggling in the face of uncertainty whilst trying to do their best as parents for their children. These findings have important clinical implications given the growing referrals for consideration of DBS childhood dystonia, and highlights the importance of further quantitative research to fully establish the efficacy of DBS in secondary dystonia to enhance informed decision-making.

[PMID: 27658770](#)

**17. Dev Med Child Neurol. 2016 Sep 19. doi: 10.1111/dmcn.13237. [Epub ahead of print]**

Participation, both a means and an end: a conceptual analysis of processes and outcomes in childhood disability.

Imms C, Granlund M, Wilson PH, Steenbergen B, Rosenbaum PL, Gordon AM.

This review outlines a conceptual approach to inform research and practice aimed at supporting children whose lives are complicated by impairment and/or chronic medical conditions, and their families. 'Participation' in meaningful life activities should be an essential intervention goal, to meet the challenges of healthy growth and development, and to provide opportunities to help ensure that young people with impairments reach their full potential across their lifespan. Intervention activities and research can focus on participation as either an independent or dependent variable. The proposed framework and associated hypotheses are applicable to children and young people with a wide variety of conditions, and to their families. In taking a fresh 'non-categorical' perspective to health for children and young people, asking new questions, and exploring issues in innovative ways, we expect to learn lessons and to develop creative solutions that will ultimately benefit children with a wide variety of impairments and challenges, and their families, everywhere.

[PMID: 27640996](#)

## Prevention and Cure

### 18. *Dev Med Child Neurol.* 2016 Sep 20. doi: 10.1111/dmcn.13278. [Epub ahead of print]

Estimation of the number of children with cerebral palsy using nationwide health insurance claims data in Japan.

Toyokawa S, Maeda E, Kobayashi Y.

**AIM:** Japan lacks a population-based registration system for cerebral palsy (CP), therefore the nationwide prevalence of CP is unknown. Our aim was to estimate the number of children with CP using the National Database of Health Insurance Claims and Specific Health Checkups of Japan, which has been recently developed by the government. **METHOD:** Study participants were children and adolescents aged below 20 years, who had been assigned CP diagnosis codes more than once in claims issued between June 2012 and May 2013 from all health insurance schemes in Japan, except for Social Welfare and Elderly Health Insurance. **RESULTS:** The number of participants with diagnosed CP was 44 381. The number of males with CP (25 237) was greater than the number of females (19 144). Peak CP prevalence per 1000 population was 2.39 at age 4 years, and this gradually declined with age. The prevalence of CP per 1000 population was 2.27 at age 5 to 9 years. The numbers of inpatients and outpatients with CP were 9126 (20.6%) and 35 255 (79.4%) respectively. **INTERPRETATION:** Our estimation of CP prevalence per 1000 population at age 5 to 9 years lay in the higher range of figures from previous studies in Japan, and was close to figures reported by European countries.

[PMID: 27644438](#)

### 19. *BMJ Open.* 2016 Sep 20;6(9):e011972. doi: 10.1136/bmjopen-2016-011972.

Motor vehicle crashes during pregnancy and cerebral palsy during infancy: a longitudinal cohort analysis.

Redelmeier DA, Naqib F, Thiruchelvam D, R Barrett JF.

**OBJECTIVES:** To assess the incidence of cerebral palsy among children born to mothers who had their pregnancy complicated by a motor vehicle crash. **DESIGN:** Retrospective longitudinal cohort analysis of children born from 1 April 2002 to 31 March 2012 in Ontario, Canada. **PARTICIPANTS:** Cases defined as pregnancies complicated by a motor vehicle crash and controls as remaining pregnancies with no crash. **MAIN OUTCOME:** Subsequent diagnosis of cerebral palsy by age 3 years. **RESULTS:** A total of 1 325 660 newborns were analysed, of whom 7933 were involved in a motor vehicle crash during pregnancy. A total of 2328 were subsequently diagnosed with cerebral palsy, equal to an absolute risk of 1.8 per 1000 newborns. For the entire cohort, motor vehicle crashes correlated with a 29% increased risk of subsequent cerebral palsy that was not statistically significant (95% CI -16 to +110,  $p=0.274$ ). The increased risk was only significant for those with preterm birth who showed an 89% increased risk of subsequent cerebral palsy associated with a motor vehicle crash (95% CI +7 to +266,  $p=0.037$ ). No significant increase was apparent for those with a term delivery (95% CI -62 to +79,  $p=0.510$ ). A propensity score-matched analysis of preterm births ( $n=4384$ ) yielded a 138% increased relative risk of cerebral palsy associated with a motor vehicle crash (95% CI +27 to +349,  $p=0.007$ ), equal to an absolute increase of about 10.9 additional cases per 1000 newborns (18.2 vs 7.3,  $p=0.010$ ). **CONCLUSIONS:** Motor vehicle crashes during pregnancy may be associated with an increased risk of cerebral palsy among the subgroup of cases with preterm birth. The increase highlights a specific role for traffic safety advice in prenatal care.

[PMID: 27650764](#)

### 20. *Childs Nerv Syst.* 2016 Sep 14. [Epub ahead of print]

Pathogenesis of cerebral palsy through the prism of immune regulation of nervous tissue homeostasis: literature review.

Lisovska N, Daribayev Z, Lisovskyy Y, Kussainova K, Austin L, Bulekbayeva S.

**BACKGROUND:** The cerebral palsy is highly actual issue of pediatrics, causing significant neurological disability. Though the great progress in the neuroscience has been recently achieved, the pathogenesis of cerebral palsy is still poorly understood. **METHODS:** In this work, we reviewed available experimental and clinical data concerning the role of immune cells in pathogenesis of cerebral palsy. Maintaining of homeostasis in nervous tissue and its transformation in case of periventricular

leukomalacia were analyzed. RESULTS: The reviewed data demonstrate involvement of immune regulatory cells in the formation of nervous tissue imbalance and chronicity of inborn brain damage. The supported opinion, that periventricular leukomalacia is not a static phenomenon, but developing process, encourages our optimism about the possibility of its correction. CONCLUSIONS: The further studies of changes of the nervous and immune systems in cerebral palsy are needed to create fundamentally new directions of the specific therapy and individual schemes of rehabilitation.

[PMID: 27638717](#)

**21. Early Hum Dev. 2016 Sep 17. pii: S0378-3782(16)30404-2. doi: 10.1016/j.earlhumdev.2016.09.008. [Epub ahead of print]**

IGF-1 in retinopathy of prematurity, a CNS neurovascular disease.

Liegl R, Löfqvist C, Hellström A, Smith LE.

The retina is part of the central nervous system and both the retina as well as the brain can suffer from severe damage after very preterm birth. Retinopathy of prematurity is one of the major causes of blindness in these children and brain neuronal impairments including cognitive defects, cerebral palsy and intraventricular hemorrhage (IVH) are also complications of very preterm birth. Insulin-like growth factor 1 (IGF-1) acts to promote proliferation, maturation, growth and survival of neural cells. Low levels of circulating IGF-1 are associated with ROP and defects in the IGF-1 gene are associated with CNS disorders including learning deficits and brain growth restriction. Treatment of preterm infants with recombinant IGF-1 may potentially prevent ROP and CNS disorders. This review compares the role of IGF-1 in ROP and CNS disorders. A recent phase 2 study showed a positive effect of IGF-1 on the severity of IVH but no effect on ROP. A phase 3 trial is planned.

[PMID: 27650433](#)