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Interventions and Management

1. Cost-effectiveness analysis of a surveillance program to prevent hip dislocation in children with cerebral palsy.
Vallejo-Torres L, Rivero-Santana A, Martin-Saborido C, Epstein D, Perestelo-Pérez L, Castellano-Fuentes CL, Escobar-Martínez A, Serrano-Aguilar P.

Gac Sanit. 2019 Sep 14. pii: S0213-9111(19)30149-9. doi: 10.1016/j.gaceta.2019.05.005. [Epub ahead of print]

OBJECTIVE: In this study we conducted an economic evaluation of a surveillance programme to prevent hip dislocation in children with cerebral palsy. **METHOD:** We developed a model that compared costs and health outcomes of children with cerebral palsy with and without a surveillance programme. Information from a number of sources was combined into a decision analytical model, primarily based on data from a comparative study with a 20-year follow-up. Effectiveness was measured using Quality-Adjusted Life Years (QALYs). The analysis took the perspective of the Spanish National Health Service. We undertook extensive sensitivity analyses including a probabilistic sensitivity analysis. **RESULTS:** The surveillance programme led to higher QALYs and higher health care costs, with an estimated incremental cost per QALY gained of 12,282€. The results were robust to model assumptions. The probability that the programme was cost-effective was estimated to be over 80% at the threshold of 25.000€/QALY recommended in Spain. **CONCLUSION:** This study indicates that surveillance programmes to prevent hip dislocation in children with cerebral palsy are likely to be cost-effective.

PMID: [31530485](#)

2. Comprehensive evaluation of gait, spasticity, and muscle morphology: A case report of a child with spastic paresis treated with Botulinum NeuroToxin-A, serial casting, and physiotherapy.
Weide G, Sloot L, Oudenhoven L, Jaspers RT, Harlaar J, Buizer A, Bar-On L.

Clin Case Rep. 2019 Jul 21;7(9):1637-1646. doi: 10.1002/ccr3.2227. eCollection 2019 Sep.

Comprehensive instrumented muscle and joint assessments should be considered when prescribing Botulinum NeuroToxin-A (BoNT-A) treatment in spastic paresis. In a child with spastic paresis, comprehensive evaluation following treatment with BoNT-A, serial casting, and physiotherapy showed that short-term improvements in gait occurred without changes in muscle morphology. Rather, foot flexibility increased.

PMID: [31534717](#)

3. Gait Characteristics of Children with Spastic Cerebral Palsy during Inclined Treadmill Walking under a Virtual Reality Environment.

Ma Y, Liang Y, Kang X, Shao M, Siemelink L, Zhang Y.

Appl Bionics Biomech. 2019 Aug 19;2019:8049156. doi: 10.1155/2019/8049156. eCollection 2019.

OBJECTIVE: To investigate gait characteristics in children with spastic cerebral palsy during inclined treadmill walking under a virtual reality environment. **METHODS:** Ten spastic cerebral palsy (CP) children and ten typically developing (TD) children were asked to walk at their comfortable speed on a treadmill at a ground level and 10° inclined. Three-dimensional kinematic data and ground reaction force data were captured in a computer-assisted rehabilitation environment system. Kinetic parameters and dynamic balance parameters were calculated using a standard biomechanical approach. **RESULTS:** During uphill walking, both groups decreased walking speed and stride length and increased peak pelvis tilt, ankle dorsiflexion, and hip flexion. Compared with TD children, CP children had decreased walking speed and stride length, decreased peak hip abduction moment, increased stance phase percentage, increased peak ankle dorsiflexion and knee flexion, and increased peak hip extension moment. The peak trunk rotation angle, ankle angle at initial contact, and stride length showed a significant group*walking condition interaction effect. **CONCLUSIONS:** CP children showed similar adjustments for most gait parameters during uphill walking as TD children. With a lower walking speed, CP children could maintain similar dynamic balance as TD children. Uphill walking magnifies the existing abnormal gait patterns of the cerebral palsy children. We suggest that during a treadmill training with an inclination, the walking speed should be carefully controlled in the case of improving peak joint loading too much.

PMID: [31531126](#)

4. Improvement and sustainability of walking ability with hybrid assistive limb training in a patient with cerebral palsy after puberty: a case report.

Nakagawa S, Mutsuzaki H, Mataka Y, Endo Y, Kamada H, Yamazaki M.

J Phys Ther Sci. 2019 Aug;31(8):633-637. doi: 10.1589/jpts.31.633. Epub 2019 Aug 19.

[Purpose] Cerebral palsy is one of the most common causes of childhood physical disability affecting motor development. Gait training with a wearable-robot, such as the Hybrid Assistive Limb, has been reported to improve gait ability in patients with chronic motor disabilities; however, there are no reports concerning the sustained improvement of walking ability with its use in patients with cerebral palsy. We present our observations for the use of Hybrid Assistive Limb gait training in a postpubescent cerebral palsy patient. [Participant and Methods] A 17-year-old male with spastic cerebral palsy could only ambulate slightly using a crouch gait posture and with the aid of a walker. Hybrid Assistive Limb training was performed thrice weekly for 4 weeks (total of 12 sessions) along with concurrent daily physical therapy. The follow-up period was 7 months after the intervention. [Results] The intervention resulted in improvements in the patient's gait speed, proportion of the stance phase in a gait cycle, step length, and the flexion angle of the knees at initial contact and during late stance phase, which was sustained for 7 months following the intervention. [Conclusion] Our observations suggest that Hybrid Assistive Limb training may effectively improve and sustain walking ability even among postpubescent cerebral palsy patients who have a decreased walking ability.

PMID: [31528000](#)

5. A wearable gait analysis protocol to support the choice of the appropriate ankle-foot orthosis: A comparative assessment in children with Cerebral Palsy.

Contini BG, Bergamini E, Alvini M, Di Stanislao E, Di Rosa G, Castelli E, Vannozzi G, Camomilla V.

Clin Biomech (Bristol, Avon). 2019 Aug 27;70:177-185. doi: 10.1016/j.clinbiomech.2019.08.009. [Epub ahead of print]

BACKGROUND: Cerebral Palsy is, nowadays, the most common cause of pediatric disabilities, particularly debilitating for daily living activities. While the adoption of ankle-foot orthoses is very well established as gait treatment, the choice of the most appropriate orthotic configuration is not strongly supported by scientific evidence. The aim of this study was to develop an instrumented assessment protocol based on wearable gait analysis to support clinicians in ankle-foot orthoses configuration selection. **METHODS:** Ten children with spastic diplegic Cerebral Palsy were assessed (7 males, aged 4 to 11 years; all functionally classified as Gross Motor Function Classification System I or II, with clinical indication of conservative treatment through use of ankle-foot orthoses). They performed a 10Meter Walk Test in three conditions: barefoot and wearing alternatively a polypropylene hinged and solid ankle-foot orthosis accommodated in the same off-the-shelf shoe model, after 20 days of daily use of each configuration. An instrumented assessment protocol based on body-mounted magneto-inertial sensors was devised to derive spatio-temporal, gait stability and symmetry biomechanical parameters within an observational pre and post cross over design. **FINDINGS:** The analysis at the individual level quantitatively revealed how different patients benefited differently from the two orthoses. No general indications were obtained in favour of or against a specific

configuration for the sample as a whole. INTERPRETATION: The proposed instrumented protocol represents a quantitative and useful tool to support the clinical selection of an appropriate orthotic treatment and, potentially, in evaluating its effectiveness.

PMID: [31525659](#)

6. Newly developed hybrid assistive limb for pediatric patients with cerebral palsy: a case report.

Nakagawa S, Mutsuzaki H, Mataka Y, Endo Y, Matsuda M, Yoshikawa K, Kamada H, Yamazaki M.

J Phys Ther Sci. 2019 Aug;31(8):702-707. doi: 10.1589/jpts.31.702. Epub 2019 Aug 9.

[Purpose] The effect of fitness training on improving walking ability in cerebral palsy is controversial. However, gait training with a wearable robot (hybrid assistive limb) has been reported to improve gait ability in patients with cerebral palsy. For pediatric patients, a smaller, lighter-weight hybrid assistive limb has been newly developed. We describe the immediate effect of this newly developed smaller hybrid assistive limb on the gait ability of a pediatric patient with cerebral palsy and examine its safety and feasibility. [Participant and Methods] An 11-year-old male with spastic cerebral palsy (height, 130 cm; weight, 29.0 kg) who could ambulate using an elbow crutch participated in this study. A single session of hybrid assistive limb training comprising pre-exercise of the hip and knee joints and walking for 20 minutes was conducted. [Results] The intervention immediately improved his gait speed, stride length, and cadence according to the 10-m walking test. Co-contraction of agonist/antagonist muscles during walking improved, and the flexion angle of the right hip during the swing phase increased, which resulted in symmetry of movement of both legs. [Conclusion] Gait training using the new, smaller hybrid assistive limb for a pediatric patient was safe and feasible, and the newly developed hybrid assistive limb has the potential to immediately improve walking ability even among young children with cerebral palsy.

PMID: [31528013](#)

7. The immediate influence of various whole-body vibration frequency on balance and walking ability in children with cerebral palsy: a pilot study.

Han YG, Lee SW, Yun CK.

J Exerc Rehabil. 2019 Aug 28;15(4):597-602. doi: 10.12965/jer.1938318.159. eCollection 2019 Aug.

The purpose of this pilot study is to examine the immediate effect of interventions based on the frequency of whole-body vibration on children with cerebral palsy's balance and walking abilities. A total of 12 were selected as subjects. All subjects measured 10-m walking test (10MWT), Timed Up and Go (TUG) test and measured sway length (SL) and limit of stability (LOS) by bio-rescue. And those were performed again after the frequencies of the 12, 18, and 26 Hz were applied respectively. To check the immediate effect, all subjects performed only one frequency of interventions per day and no other treatment was performed in parallel to control the foreign variables. After intervention, 10MWT were significantly increased in the 12 and 18 Hz groups ($P < 0.05$). TUG test and LOS were significantly increased in the 18 Hz group ($P < 0.05$). There were no significant differences on TUG, SL, and LOS in the 12 Hz group. There were no significant differences on 10MWT, TUG, SL, and LOS in the 26 Hz group. Looking at the results of this study, the immediate effect of whole-body vibration shows that the frequency of the 18 Hz group is the most effective interventions in promoting walking and balancing abilities in children with cerebral palsy than frequencies of the 12 and 26 Hz groups.

PMID: [31523683](#)

8. The Impact of Vocational Interventions on Vocational Outcomes, Quality of Life, and Community Integration in Adults with Childhood Onset Disabilities: A Systematic Review.

Ma Z, Dhir P, Perrier L, Bayley M, Munce S.

J Occup Rehabil. 2019 Sep 18. doi: 10.1007/s10926-019-09854-1. [Epub ahead of print]

Purpose Despite the desire and ability to work, individuals with childhood onset disabilities are under-represented in employment. Vocational interventions alleviate some barriers to obtaining and maintaining employment for this population. The research question addressed is: What is the impact of vocational interventions on vocational outcomes, quality of life

(QoL), and community integration (CI) in adults with childhood onset neurological disabilities including cerebral palsy (CP), spina bifida, and acquired brain injury (ABI)? Methods A literature search was conducted in multiple electronic databases. All experimental and observational studies with comparator group(s) were included. Two reviewers independently completed titles and abstracts screening, full text screening, data abstraction, and risk of bias assessment. Results Seventeen studies were eligible for final inclusion including three randomized-controlled trials, four non-randomized studies, and ten observational studies. Sixteen of seventeen studies included only individuals with ABI, while one study included individuals with CP. Vocational interventions from experimental studies were mainly components of multi-faceted interventions. Most observational studies were from the United States Vocational Rehabilitation Service. Conclusions Vocational interventions may be effective in improving vocational outcomes, QoL, and CI for individuals with ABI. There is limited experimental evidence on interventions that specifically target employment. Observational data suggest that receiving job placement assistance, on-the-job training and supports, counselling/guidance, maintenance, and supported employment successfully predicted employment outcomes.

PMID: [31535267](#)

9. Reduced brain processing of affective pictures in children with cerebral palsy.

Belmonte S, Montoya P, González-Roldán AM, Riquelme I.

Res Dev Disabil. 2019 Sep 11;94:103457. doi: 10.1016/j.ridd.2019.103457. [Epub ahead of print]

Sensory and cognitive deficits are common comorbidities in children with cerebral palsy. This observational study examines if brain processing of affective information is also altered in children with cerebral palsy (CP) in comparison with typically developing peers (TDP). METHODS: Evoked-related potentials were recorded in 15 children with CP (age = 11.27 ± 4.53 yr, 6 girls) and 14 TDP (age = 10.14 ± 4.29 yr, 5 girls) when viewing pleasant, unpleasant and neutral pictures. The subjective perception of valence and arousal of each one of the pictures was examined. RESULTS: Children with CP showed a significant amplitude reduction of evoked potentials in the occipital region to the affective stimuli in early brain processing latencies (P100 and N200; all $F > 2.9$, all $p < .05$). Children with CP rated pictures with affective content (pleasant and unpleasant) as less arousing ($F(2.25) = 46.71$, $p < .001$), and neutral pictures as more pleasant, than their TDP ($F(2.25) = 75.56$, $p < .001$). CONCLUSION: The pictures with emotional content produce less activation, both at the behavioral and brain processing levels in children with CP. These differences were found in early latencies of brain processing which could be related to alterations in the detection of emotionally relevant stimuli.

PMID: [31520963](#)

10. Early Brain Damage Affects Body Schema and Person Perception Abilities in Children and Adolescents with Spastic Diplegia.

Butti N, Montiroso R, Giusti L, Piccinini L, Borgatti R, Urgesi C.

Neural Plast. 2019 Aug 18;2019:1678984. doi: 10.1155/2019/1678984. eCollection 2019.

Early brain damage leading to cerebral palsy is associated to core motor impairments and also affects cognitive and social abilities. In particular, previous studies have documented specific alterations of perceptual body processing and motor cognition that are associated to unilateral motor deficits in hemiplegic patients. However, little is known about spastic diplegia (SpD), which is characterized by motorial deficits involving both sides of the body and is often associated to visuospatial, attentional, and social perception impairments. Here, we compared the performance of a sample of 30 children and adolescents with SpD (aged 7-18 years) and of a group of age-matched controls with typical development (TD) at two different tasks tapping on body representations. In the first task, we tested visual and motor imagery abilities as assessed, respectively, by the object-based mental rotation of letters and by the first-person transformations for whole-body stimuli. In the second task, we administered an inversion effect/composite illusion task to evaluate the use of configural/holistic processing of others' body. Additionally, we assessed social perception abilities in the SpD sample using the NEPSY-II battery. In line with previously reported visuospatial deficits, a general mental imagery impairment was found in SpD patients when they were engaged in both object-centered and first-person mental transformations. Nevertheless, a specific deficit in operating an own-body transformation emerged. As concerns body perception, while more basic configural processing (i.e., inversion effect) was spared, no evidence for holistic (i.e., composite illusion) body processing was found in the SpD group. NEPSY-II assessment revealed that SpD children were impaired in both the theory of mind and affect recognition subtests. Overall, these findings suggested that early brain lesions and biased embodied experience could affect higher-level motor cognition and perceptual body processing, thus pointing to a strict link between motor deficits, body schema alterations, and person processing difficulties.

PMID: [31531012](#)

11. Prevalence, identification, and interference of pain in young children with cerebral palsy: a population-based study.
Tedroff K, Gyllensvärd M, Löwing K.

Disabil Rehabil. 2019 Sep 17:1-7. doi: 10.1080/09638288.2019.1665719. [Epub ahead of print]

Objective: To explore the presence of pain, how pain was addressed by physicians and parents, and how pain affected everyday life in young children with cerebral palsy (CP). **Methods:** Children with CP, aged 5-10 years, participated in this cross-sectional study. Data were collected from medical records spanning a period of two years and by a standardized parental interview that included six structured questions and the Pain Interference Index. **Results:** A total of 118 children, with a mean age of 7.4 years (SD 1.5), participated in the study. The parents of 81% of these children were interviewed. Pain was reported in 52% of the children, and pain was present at all severity levels. The prescription of analgesics was documented in 25% of these children's medical records. Fifty-nine percent of the children with pain received analgesics from their parents. Pain restricted the children's everyday lives particularly concerning sleep, school work and being with friends. **Conclusions:** Half of this group of young children with CP were reported to have pain. Pain restricted the children's everyday lives and seemed to be under-treated. If pain can be addressed early, the children's everyday lives are likely to be improved. **Implications for rehabilitation** There is a need to early identify and treat pain in young children. Important to discuss pain with parents irrespectively of the child's age and severity level. Pain interference assessment gives valuable information. Early treatment of pain might improve children's everyday life.

PMID: [31526138](#)

12. Acute and chronic pain in children and adolescents with cerebral palsy: prevalence, interference and management.
Ostojic K, Paget S, Kyriagis M, Morrow A.

Arch Phys Med Rehabil. 2019 Sep 12. pii: S0003-9993(19)31060-3. doi: 10.1016/j.apmr.2019.08.475. [Epub ahead of print]

OBJECTIVE: To determine the prevalence, impact and management of acute and chronic pain amongst youth aged 5-18 years with cerebral palsy, attending outpatient rehabilitation services. **DESIGN:** A cross-sectional study using the Faces Pain Scale-Revised, Patient Reporting Outcomes Measurement Information System Pediatric Pain Interference Scale and Cerebral Palsy Quality of Life questionnaire. Where children were unable to self-report, parent/caregiver proxy was obtained. **SETTING:** Outpatient rehabilitation. **PARTICIPANTS:** 280 participants with cerebral palsy aged 5-18 years and/or their parent/caregiver. 45.7% (n=128) self-report and 54.3% (n=152) proxy-report. **INTERVENTIONS:** Not applicable. **MAIN OUTCOME MEASURE:** Presence/absence of acute and chronic pain. Secondary measures were pain intensity, pain interference, pain management and quality of life. **RESULTS:** Acute pain and chronic pain were reported by 67.1% and 31.4% of participants respectively. Of those reporting acute pain, 42% also experienced chronic pain. Factors that increased the odds of chronic pain were: predominately dyskinesia (OR= 3.52; 95% CI: 1.64-7.55); mixed spasticity-dyskinesia (OR= 1.93; 95% CI: 1.07-3.47); bilateral involvement (OR= 3.22; 95% CI: 1.844-5.61) and GMFCS level IV (OR= 2.32; 95% CI: 1.02 - 5.25) and V (OR= 3.73; 95% CI: 1.70 - 8.20). Pain frequently interferes with sleep, attention, ability to have fun and quality of life. Short-acting pharmacological analgesics, thermotherapy, hydrotherapy and massage were commonly used for pain management. **CONCLUSIONS:** Routine screening for pain is critical for early identification and intervention. Multimodal interventions are needed to address the biopsychosocial model of pain, and should be tailored for all abilities across the CP spectrum.

PMID: [31521713](#)

13. Children and Youth with Complex Cerebral Palsy: Care and Management. Himmelman K.

Acta Paediatr. 2019 Sep 16. doi: 10.1111/apa.14974. [Epub ahead of print] Edited by Laurie J. Glader, Richard D. Stevenson. London: Mac Keith Press, 2019, pp 384. ISBN: 978-1-909962-98-9.

PMID: [31524307](#)

14. [Effect of acupoint thread-embedding therapy on the sitting ability of ataxia children with cerebral palsy].

Jin BX, Zhao Y, Qian XG, Zhou Y, Zhao YL, Liu HZ, Fu WJ, Li N.

Zhen Ci Yan Jiu. 2019 Sept 25;44(9):668-71. doi: 10.13702/j.1000-0607.180191. [Article in Chinese]

OBJECTIVE: To investigate the effective of acupoint thread-embedding therapy for ataxia children with cerebral palsy. **METHODS:** A total of 70 ataxia children with cerebral palsy and a Gross Motor Function Measure (GMFM, Dimension B) score of <35 were enrolled and randomly divided into thread-embedding group and control group, with 35 children in each group, and 2 children in the thread-embedding group were lost to follow-up. The children in the control group were given routine rehabilitation treatment, including physical therapy, spleen-strengthening, kidney-nourishing, and Governor Vessel-regulating massage, vibroacoustic therapy, and scalp acupuncture, and those in the thread-embedding group were given thread-embedding therapy at the acupoints of Jianyu (LI15), Jianliao (SJ14), Tianzong (SI11), Tianshu (ST25), and HuatuoJiaji points (C4, L1 and L4) in addition to the treatment in the control group, with 6-8 acupoints selected each time, once a week. Each course of treatment was 4 weeks, with an interval of one week between two courses of treatment, and the children were treated for 3 courses. Level of sitting scale (LSS), incurvation reflex, and GMFM score were recorded to evaluate the improvement in sitting ability and clinical outcome. **RESULTS:** Both groups had significant improvements in LSS, incurvation reflex, and GMFM (Dimension A and B) score after treatment ($P<0.01$), and the thread-embedding group had significantly greater improvements than the control group ($P<0.01$). The thread-embedding group had a significantly higher overall response rate than the control group (90.9% [30/33] vs 68.5% [24/35], $P<0.01$). **CONCLUSION:** In addition to routine rehabilitation treatment, acupoint thread-embedding therapy can effectively suppress primitive reflex in ataxia children with cerebral palsy and significantly promote their sitting ability, and therefore, it is an effective acupuncture treatment method for ataxia children with cerebral palsy.

PMID: [31532137](#)

15. Management of disseminated intravascular coagulation associated with placental abruption and measures to improve outcomes.

Takeda J, Takeda S.

Obstet Gynecol Sci. 2019 Sep;62(5):299-306. doi: 10.5468/ogs.2019.62.5.299. Epub 2019 Jul 23.

Placental abruption is a condition that should be carefully considered in perinatal management because it is associated with serious events in both the mother and neonate, such as intrauterine fetal death, cerebral palsy, obstetric critical bleeding, and uncontrollable bleeding. The concomitant presence of disseminated intravascular coagulation (DIC) more easily causes critical bleeding that may necessitate hysterectomy or multi-organ failure resulting in maternal death. Therefore, early management should be provided to prevent progression to serious conditions by performing both hemostatic procedures and DIC treatment. To take measures to improve the outcomes in both the mother and neonate, health guidance for pregnant women, early diagnosis, early treatment, development of the emergency care system, and provision of a system for transport to higher-level medical institutions should be implemented.

PMID: [31538072](#)

16. Variable Decelerations.

Authors Sung S, Abramovitz A.

Source StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019-. 2019 Sep 15.

Adverse neonatal outcomes result from a complex interplay of intrapartum events, antepartum complications, placental function or dysfunction, and uterine perfusion.[1] Electronic fetal monitoring is widely utilized intrapartum to assess fetal status, to prevent adverse neonatal outcomes such as fetal asphyxia or cerebral palsy. Unfortunately, there is high intraobserver and interobserver variability when interpreting fetal heart rate tracings. In one study, obstetricians interpreted fetal heart rate tracings similarly in only 29% of cases.[2] In 2008, terminology and nomenclature for electronic fetal monitoring were standardized at a workshop sponsored by the American College of Obstetricians and Gynecologists, the Society for Maternal-Fetal Medicine, and the Eunice Kennedy Shriver National Institute of Child Health and Human Development.[3] This workshop defined variable decelerations as abrupt, visually apparent decreases in the fetal heart rate. The onset of the deceleration to the nadir should be less than 30 seconds. The decrease from the fetal heart rate baseline should be at least 15 beats per minute and should last for at least 15 seconds, but less than 2 minutes. Variable decelerations can be periodic, meaning they are associated with contractions, or they can be episodic and not associated with uterine contractions.[3]

PMID: [31536234](#)

17. Portable Stroke Diagnosis Devices for Adults with Stroke Symptoms: A Review of Diagnostic Accuracy and Cost-Effectiveness [Internet].

Editors: Young C, MacDougall D.

Source: Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2019 Jul. CADTH Rapid Response Reports.

A stroke is the sudden loss of brain function due to cell death resulting from poor or interrupted blood flow within the brain. Strokes are classified as either ischemic, due to lack of blood flow, or hemorrhagic, which are caused by uncontrolled bleeding in the brain.¹ Symptoms of stroke include sudden weakness, inability to move or feel on one side of the body (i.e., paralysis), problems understanding or speaking, dizziness, loss of vision, severe headache, and loss of consciousness.² Stroke is the second leading cause of death globally,³ accounting for nearly six percent of all deaths in Canada.⁴ There are an estimated 62,000 cases of stroke that occur each year in Canada, and although risk for stroke increases with age, they affect individuals of all age groups.⁵ Clinical diagnosis of stroke can be made using patient history and physical examination, diagnostic tests (e.g., blood glucose, oxygen saturation, prothrombin time, and electrocardiography), and various neuroimaging techniques such as computed tomography (CT) or magnetic resonance imaging (MRI). Although advanced imaging techniques such as CT and MRI are considered the gold standard for stroke identification,^{6–8} they may not always be readily available in resource-constrained health care settings. A number of novel stroke diagnostic devices have been developed in order to decrease the amount of time required to establish a stroke diagnosis, which is important given that the early identification and treatment of stroke are critical for improving clinical outcomes and ensuring patients receive necessary medical attention.^{5,9} These portable diagnostic devices utilize various imaging techniques, such as Doppler ultrasound, volumetric impedance phase-shift spectroscopy, or microwave tomography to visualize the blood flow characteristics of the brain, providing information on the likelihood a patient has experienced a stroke.^{10–13} This report expands upon a previously completed CADTH report (list of references).¹⁴ The objective of the current report is to evaluate the evidence regarding the diagnostic accuracy and cost-effectiveness of several portable stroke diagnostic devices for adults with symptoms of stroke.

PMID: [31536181](#)

18. Association of perinatal factors of epilepsy in very low birth weight infants, using a nationwide database in Japan.

Matsushita Y, Sakai Y, Torio M, Inoue H, Ochiai M, Yasuoka K, Kurata H, Fujiyoshi J, Ichiyama M, Taguchi T, Kato K, Ohga S; Neonatal Research Network of Japan (NRNJ).

J Perinatol. 2019 Sep 16. doi: 10.1038/s41372-019-0494-7. [Epub ahead of print]

OBJECTIVE: To determine clinical features of very low birth weight infants (VLBWIs) who had developed epilepsy by age 3 years. **STUDY DESIGN:** Multicenter cohort study using the Neonatal Research Network of Japan database. We analyzed clinical variables of 8431 VLBWIs who had recorded data of neurological sequelae at age 3 years. Logistic regression identified the association between variables and development of epilepsy. **RESULT:** One hundred and forty-three (1.7%) infants developed epilepsy, 683 (8.1%) showed cerebral palsy (CP), and 1114 (13.2%) had psychomotor delay. Epilepsy was associated with history of sepsis [adjusted odds ratio (AOR) 3.23], severe intraventricular hemorrhage (IVH; AOR 5.13), and cystic periventricular leukomalacia (PVL; AOR 12.7). Severe IVH and cystic PVL were also frequently associated with CP and psychomotor delay. **CONCLUSION:** Severe IVH and cystic PVL are strongly associated with development of epilepsy, as well as other neurological sequelae, and are potential critical therapeutic targets.

PMID: [31527650](#)

19. Giant intracranial congenital hemangiopericytoma/solitary fibrous tumor: A case report and literature review.

Giakoumettis D, Nikas I, Stefanaki K, Kattamis A, Sfakianos G, Themistocleous MS.

Surg Neurol Int. 2019 Apr 24;10:75. doi: 10.25259/SNI-85-2019. eCollection 2019.

BACKGROUND: Hemangiopericytoma and solitary fibrous tumor (HPC/SFT) are considered to be one category according to the WHO 2016 classification of central nervous system tumors. HPC/SFT are subdivided into infantile (congenital) and adult type. Both are extremely rare entities, with little knowledge about etiology, prognosis, and optimal therapeutic strategy. **CASE DESCRIPTION:** A 10-day-old girl was referred to our neurosurgical department due to hypotonia, palsy of the right oculomotor nerve, and prominent frontal fontanel. Imaging studies revealed a large occupying mass in the right middle cerebral fossa and the suprasellar cisterns. Only a subtotal resection of the tumor was possible, and postoperatively, she underwent chemotherapy (CHx). After a 3-year follow-up, the girl has minimum neurologic signs and receives no medications, and she

can walk when she is supported. **CONCLUSION:** Congenital HPC/SFT is considered to have a benign behavior with a good prognosis. Treatment with gross total resection, when it is feasible, is the key to a good prognosis and low rates of recurrence. However, there is no consensus on the therapeutic strategy of a HPC/SFT, which is difficult to be completely resected. Literature lacks a therapeutic algorithm for these tumors, and thus, more clinical studies are needed to reach a consensus.

PMID: [31528413](#)

20. Medical lessons from a historical case: The disappearance of King Charles IV.

Sharma AR.

JRSM Cardiovasc Dis. 2019 Sep 4;8:2048004019872371. doi: 10.1177/2048004019872371. eCollection 2019 Jan-Dec.

Traumatic injury to the brain and its vessels is a major part of medical practice across the world. Its management however has long historical origins, but those beginnings can still teach clinical practitioners about the basic care of an injured patient. We present a little known historical medical case that to this day provides an example of best practice management resulting in successful clinical outcome. Charles IV (1316-1378) was Holy Roman Emperor between 1347 and 1378. During his reign, he disappeared for four months and returned a disfigured hunchback. There has been considerable controversy as to the cause of both his physical change and disappearance. We propose the most likely cause is from an unfortunate consequence of his love of jousting. Despite the damage and management of the traumatic injury endured by Charles IV occurring over 600 years ago, there are still lessons of his clinical management relevant to this day.

PMID: [31523423](#)

21. Do policymakers have any plans to reduce the economic burden of cerebral palsy in Iran?

Karami Matin B, Soltani S.

J Res Med Sci. 2019 Aug 28;24:74. doi: 10.4103/jrms.JRMS_827_18. eCollection 2019.

Research Center for Environmental Determinants of Health (RCEDH), Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran.

PMID: [31523260](#)

22. Abstracts for the American Academy for Cerebral Palsy and Developmental Medicine 18-21 September 2019.

[No authors listed]

Dev Med Child Neurol. 2019 Oct;61 Suppl 3:3-223. doi: 10.1111/dmcn.14353.

PMID: [31531853](#)

