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# CP Research News

Monday 22 September 2008

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## 1: Eur Radiol. 2008 Sep 16. [Epub ahead of print]

### Symmetrical central tegmental tract (CTT) hyperintense lesions on magnetic resonance imaging in children.

Yoshida S, Hayakawa K, Yamamoto A, Aida N, Okano S, Matsushita H, Kanda T, Yamori Y, Yoshida N, Hirota H.

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The central tegmental tract (CTT) is mainly the extrapyramidal tract connecting between the red nucleus and the inferior olivary nucleus. There are only a few case reports describing CTT abnormalities on magnetic resonance imaging (MRI) in children. Our purpose was to evaluate the frequency of CTT lesions and their characteristics on MRI, and to correlate the MR imaging findings with clinical features. We reviewed retrospectively the MR images of 392 children (215 boys and 177 girls) ranging in age from 1 to 6 years. To evaluate symmetrical CTT hyperintense lesions, we defined a CTT lesion as an area of bilateral symmetrical hyperintensity in the tegmentum pontis on both T2-weighted images and diffusion-weighted images in more than two slices. We measured the ADC (apparent diffusion coefficient) values of symmetrical CTT hyperintensity, and compared them with those of children without CTT abnormality. CTT lesions were detected in 20 (5.1%) of the 392 children. The mean ADC value for these 20 children was significantly lower than that of the normal CTT ( $p < 0.001$ ). On MR imaging, other than CTT lesions, associated parenchymal lesion included: none ( $n = 6$ ); other abnormalities, including periventricular leukomalacia ( $n = 3$ ); thin corpus callosum ( $n = 3$ ); ventricular dilatation ( $n = 2$ ); encephalopathy ( $n = 2$ ). Clinically, cerebral palsy was the most frequent clinical diagnosis ( $n = 6$ ), accounting for 30%, which was significantly more frequent than the prevalence of cerebral palsy among children without CTT lesions (13%) ( $n < 0.05$ ). CTT lesions were detected in 5.1% of all the children examined. Cerebral palsy was the most frequent clinical diagnosis.

PMID: 18795297 [PubMed - as supplied by publisher]

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**2: J Neuropathol Exp Neurol. 2008 Sep 16. [Epub ahead of print]**

**Antenatal Bacterial Endotoxin Sensitizes the Immature Rat Brain to Postnatal Excitotoxic Injury.**

Rousset CI, Kassem J, Olivier P, Chalon S, Gressens P, Saliba E.

From the INSERM U930 (CIR, JK, SC, ES) and Université François Rabelais (CIR, SC, ES), Tours; INSERM U676 (PO, PG), Faculté de Médecine Denis Diderot, Université Paris 7 (PO, PG), and AP HP (PG), Service de Neurologie Pédiatrique, Hôpital Robert Debré, Paris; and Neonatology Hôpital Clocheville (ES), CHRU Tours, Tours, France.

Intracerebral injection of ibotenate in newborn rodents produces brain damage that mimics that of infants with cerebral palsy. Because maternal infection may contribute to brain injury in preterm infants, we investigated brain damage after maternal inflammation and postnatal ibotenate treatment in a rat model of cerebral palsy. Pregnant rats were injected intraperitoneally with lipopolysaccharide at Days 19 and 20 of gestation. Neonates were given intracerebral injections of ibotenate at postnatal Day 4 and were then killed at Day 9. Lesion sizes were measured by cresyl violet staining, and microglial activation, astrogliosis, and myelination were evaluated by immunohistochemistry. The lipopolysaccharide groups had larger cortical and white matter lesions than the control group; they also had significantly greater microglial activation and astrogliosis and less white matter myelination in the lesioned hemispheres compared with the controls. Thus, maternal endotoxin exposure may affect prenatal development of the offspring and modulate the subsequent development of excitotoxic brain lesions. These results demonstrate the critical influence of prenatal immune events on neonatal central nervous system vulnerability and provide a model for studying the pathophysiology of cerebral damage in preterm infants and, specifically, the interplay between brain inflammation and excitotoxicity.

PMID: 18800008 [PubMed - as supplied by publisher]

**3: Neurorehabil Neural Repair. 2008 Sep 16. [Epub ahead of print]**

**Limitations of Intrathecal Baclofen for Spastic Hemiparesis Following Stroke.**

Kofler M, Quirbach E, Schauer R, Singer M, Saltuari L.

**OBJECTIVE:** Intrathecal baclofen (ITB) has become the first choice in the management of deleterious spasticity that does not respond to oral and intramuscular medications following spinal cord injury, traumatic brain injury, and cerebral palsy. The usefulness of ITB in severe spastic hemiparesis following stroke is studied. **METHODS:** A total of 8 patients underwent clinical and video assessment following ITB bolus application (n = 5) and during continuous infusion via a temporary catheter system (n = 3). **RESULTS:** The mean daily dosage alleviating spasticity on the hemiparetic side-without affecting the nonparetic side-was 119 microg/day (range 50 to 360 microg/day). However, 6 patients experienced functional deterioration as ITB weakened their paretic side such that the antigravity pattern they used for ambulation was suppressed. In 2 patients, spasticity-associated pain and spasms subsided and they underwent implantation of a long-term drug delivery system. **CONCLUSIONS:** ITB may reduce spasticity in a dose-dependent manner irrespective of its origin. Although not primarily antinociceptive in humans, ITB may alleviate pain if arising from increased muscle tone. A functional benefit may result if ITB can uncover "subclinical" motor control that had been suppressed by spasticity. However, when a patient uses antigravity patterns for ambulation in the absence of more complex motor control, ITB may cause the loss of residual walking ability, which becomes a major limitation for patients with hemiplegic stroke.

PMID: 18796543 [PubMed - as supplied by publisher]

**4: Physiother Res Int. 2008 Sep 12. [Epub ahead of print]**

**The reliability, responsiveness and clinical utility of the proximat: A new tool for measuring hip range of movement in children with cerebral palsy.**

Pott P, Selley A, Tyson SF.

Lancasterian School, Manchester Primary Care Trust, Manchester, UK.

**Background and Purpose.** Monitoring range of movement is a key aspect of managing hip problems in children with cerebral palsy. The aim of this study was to assess the clinical utility, reliability and responsiveness of a new measurement tool, the Proximat, for hip range of movement. **Method.** Passive hip abduction, adduction, medial and lateral rotation were measured by using the Proximat on 26 children with cerebral palsy attending three special schools: 16 of whom are boys, mean age = 7 years and 6 months (standard deviation = 4.2 years), range 2-15 years. Testing was undertaken by two physiotherapists to assess interrater reliability and repeated the following day to assess test-retest reliability. Total, random and systematic errors were calculated for interrater and test-retest. **Results.** The Proximat was quick and easy to use and acceptable to the children. High reliability was found for all movements (intraclass correlation coefficient = 0.83-0.93) with reasonable responsiveness; total error was 2.5-12 degrees. Most of the error was random with little evidence of systematic bias. **Conclusions.** The Proximat is a reliable, responsive and acceptable method of measuring passive hip movements in children with cerebral palsy in day-to-day clinical practice. A change of 8-12 degrees is needed to overcome measurement error and to indicate that a 'true' change in range of movement has occurred. Copyright (c) 2008 John Wiley & Sons, Ltd.

PMID: 18792005 [PubMed - as supplied by publisher]

**5: N Engl J Med. 2008 Sep 11;359(11):1175-7.**

**Turning thought into action.**

Hochberg LR.

Massachusetts General Hospital and Harvard Medical School, Boston, USA.

PMID: 18784110 [PubMed - indexed for MEDLINE]

**6: Neurosci Lett. 2008 Sep 11. [Epub ahead of print]**

**Hyperthermia amplifies brain cytokine and reactive oxygen species response in a model of perinatal inflammation.**

Wang W, Dow KE, Flavin MP.

Department of Pediatrics, Queen's University, Kingston, Ontario, Canada.

Chorioamnionitis, a perinatal infection of the fetal membranes, and maternal fever, which often accompanies infection are both risk factors for cerebral palsy (CP). Inflammation is a typical reaction to infection. Thus the aim of this study was to determine if hyperthermia alters newborn rat brain inflammatory response and oxidant stress after a maternal rat lipopolysaccharide (LPS) injection. Since chorioamnionitis can predispose the fetus to perinatal hypoxia, we also explored the interaction with postnatal hypoxia. Exposure of newborn pups to brief hypoxia alone significantly increased brain tumor necrosis factor-alpha (TNF-alpha) and slightly increased levels of nitrite/nitrate. When maternal LPS was combined with postnatal hypoxia, the levels of TNF-alpha were further increased when compared with hypoxia alone. Exposure of newborn pups to hyperthermia at 39 degrees C following maternal LPS and hypoxia caused yet more significant increases in brain TNF-alpha, nitrite/nitrate, and MDA/4-HAD compared to

that under normal temperature conditions. This study supports the hypothesis that fever is a significant modifier of brain inflammatory response in developing brain particularly in a setting of hypoxia.

PMID: 18801411 [PubMed - as supplied by publisher]

**7: Child Care Health Dev. 2008 Sep;34(5):635-41.**

**Is there a relationship between preferred posture and positioning in early life and the direction of subsequent asymmetrical postural deformity in non ambulant people with cerebral palsy?**

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**BACKGROUND:** It has been suggested that asymmetrical positioning of an infant with reduced mobility may lead to postural deformity becoming established over time. However, evidence to support or question this line of thinking is lacking. Therefore, the aim of this retrospective cohort study was to test the association between asymmetrical positioning in the first 12 months of life and the subsequent direction of postural deformity in non-ambulant people with cerebral palsy. **METHODS:** The direction of scoliosis, pelvic obliquity and windswept hip pattern and also the side of unilateral hip subluxation/dislocation were determined for 246 young people ranging in age from 1 year and 2 months to 19 years (median age 10 years and 3 months). Parents/carers of the participants were interviewed to establish holding and feeding positions and preferred lying posture adopted in early life. Univariate analyses and multivariate logistic regression analyses were carried out. **RESULTS:** The study provided evidence of an association between asymmetrical lying posture adopted in the first year of life and the direction of the subsequent pattern of postural deformity. If the child's head had been rotated to the right during supine lying, it was more likely that the scoliosis would be convex to the left, pelvic obliquity would be lower on the left, windswept hip pattern would be to the right and hip subluxation/dislocation would occur on the left. The likelihood of the deformities occurring in the same direction was also increased if consistent side lying on the right had been preferred. **CONCLUSIONS:** Clinicians should be aware of positioning for children with severe disabilities particularly those who prefer supine lying with their head rotated to the side and those who prefer consistent side lying.

Publication Types:  
Research Support, Non-U.S. Gov't

PMID: 18796054 [PubMed - in process]

**8: Pediatrics. 2008 Sep;122(3):656-7.**

**Comment on:  
Pediatrics. 2008 Sep;122(3):500-6.**

Diffusion tensor imaging of white matter and developmental outcome.

Johnston MV.

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Publication Types:  
Comment  
Review

PMID: 18762535 [PubMed - indexed for MEDLINE]

**9: Pediatrics. 2008 Sep;122(3):500-6.**

**Comment in:  
Pediatrics. 2008 Sep;122(3):656-7.**

Fiber-tracking techniques can predict the degree of neurologic impairment for periventricular leukomalacia.

Murakami A, Morimoto M, Yamada K, Kizu O, Nishimura A, Nishimura T, Sugimoto T.

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**OBJECTIVE:** Preterm or low birth weight infants display a greater propensity for white matter injury caused by hypoxic-ischemic encephalopathy in the perinatal period. Such episodes can result in periventricular leukomalacia, which may substantially influence later brain development. Noninvasive methods of assessing the severity of injury at the earliest stage of life have not yet been established. **METHODS:** We used diffusion tensor imaging to evaluate sensorimotor fibers in periventricular leukomalacia. Region-of-interest measurements and tractography-based measurements were performed for 10 patients with periventricular leukomalacia. The mean age of the patients was 19 +/- 9.5 months (range: 9-41 months). Motor functions were assessed at a mean age of 28 +/- 14.5 months. **RESULTS:** Measured fractional anisotropy values of the motor tract were significantly higher in all mild periventricular leukomalacia cases than in severe cases. A fractional anisotropy cutoff value of <0.5 was useful for predicting severe periventricular leukomalacia. Region-of-interest measurements were less sensitive, compared with tractography-based measurements. **CONCLUSIONS:** Fiber-tracking techniques can provide information on the pathophysiologic features of motor disability in patients with periventricular leukomalacia. Early screening of patients with a history of asphyxia may facilitate early intervention (eg, rehabilitation), to achieve better motor function.

Publication Types:  
Comparative Study

PMID: 18762518 [PubMed - indexed for MEDLINE]

**10: Epilepsy Behav. 2008 Aug;13(2):300-6. Epub 2008 May 20.**

**Voluntary brain regulation and communication with electrocorticogram signals.**

Hinterberger T, Widman G, Lal TN, Hill J, Tangermann M, Rosenstiel W, Schölkopf B, Elger C, Birbaumer N.

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Brain-computer interfaces (BCIs) can be used for communication in writing without muscular activity or for learning to control seizures by voluntary regulation of brain signals such as the electroencephalogram (EEG). Three of five patients with epilepsy were able to spell their names with electrocorticogram (ECoG) signals derived from motor-related areas within only one or two training sessions. Imagery of finger or tongue movements was classified with support-vector classification of autoregressive coefficients derived from the ECoG signals. After training of the classifier, binary classification responses were used to select letters from a computer-generated menu. Offline analysis showed increased theta activity in the unsuccessful patients, whereas the successful patients exhibited dominant sensorimotor rhythms that they could control. The high spatial resolution and increased signal-to-noise ratio in ECoG signals, combined with short training periods, may offer an alternative for communication in complete paralysis, locked-in syndrome, and motor restoration.

Publication Types:

Research Support, Non-U.S. Gov't

PMID: 18495541 [PubMed - indexed for MEDLINE]

**11: J Orofac Orthop. 2008 Jul;69(4):240-56. Epub 2008 Sep 13.**

**Orofacial findings in conjunction with infantile cerebral paralysis in adults of two different age groups--a cross-sectional study.** [Article in English, German]

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**OBJECTIVES:** The objective of this cross-sectional study was to assess differentiated malocclusion symptoms and dental findings such as caries prevalence in patients suffering from infantile cerebral paralysis (CP, ICP), as well as the amount of dental and orthodontic treatment. **SUBJECTS AND METHODS:** Sixty-two patients suffering from infantile cerebral paralysis (ICP) aged from 18 to 78 years were included in the study and assigned to one of two groups according to age. The analysis was carried out on study models that had been measured using a caliper gauge and an electronic model-measuring procedure. Clinical caries status and sociological data were evaluated and statistically analyzed. **RESULTS:** While the group of older patients underwent no orthodontic treatment, we observed a statistically-significant increase in orthodontic treatment in the younger group with infantile cerebral paralysis. The model analysis revealed a mean overjet of 4.8 mm (SD+/-3.9 mm). There was a tendency toward open bite in terms of the vertical relation, with the mean overbite measuring 1.6 mm (+/-3.7 mm). Comparing the two age groups, we noted that greater age correlated significantly with reduced dental crowding symptoms in the lower jaw, contrary to the more common development of crowding in the normal population. The resulting value of the palatal height index was 40.8%, with no differences between the age groups. Compared to the index of 42.0% (according to the average data in the literature), those participating in this study and suffering from ICP had a flatter palatal vault. Our study parameter "dental intervention per year" revealed that 2/3 of the patients had three dentist appointments per year with no significant difference between the age groups. The ICP patients' mean DMF/T index value was 13.4, which appears to be generally lower than the published values concerning disabled persons in Germany and the healthy population. **CONCLUSIONS:** We observed an overall correlation between the frequency of malocclusions and severity of mental retardation. The amount of orthodontic treatment was significantly higher in the younger group (32.3%) than the older group (0%). In diagnostic terms, orthodontic treatment should follow the general guidelines, namely, the recommendation of removable devices as treatment appliances, and multidisciplinary speaking, modified sequences of myofunctional therapy in consideration of the individual compliance prognosis and parental cooperation. In the multidisciplinary coordination of rehabilitation under general anesthesia, specific orthodontic measures may be undertaken (such as taking impressions, limited fixed appliance insertions, controlled extractions). An early treatment start in combination with the appropriate orthodontic device is desirable because of the improved, trainable reflex pattern. The dental therapy results are generally positive due to the fact that our patients met a tight dental recall schedule.

PMID: 18797829 [PubMed - in process]

**12: Georgian Med News. 2008 Mar;(156):55-60.**

**Feeding difficulties in children and adolescents with chronic illness.**

Sullivan P.

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Good health demands good nutrition and in the child it is reflected in normal growth. Children who cannot or do not eat properly often become unwell and do not grow. This becomes a source of great con-

cern and anxiety for their parents. Several chronic illnesses in children impair normal feeding; this article aims to describe the interrelationship between eating and disease in children with reference to some common conditions. The effects of childhood eating disorders on parents and families will also be considered.

PMID: 18403810 [PubMed - indexed for MEDLINE]

**13: Rev Neurol. 2008;47 Suppl 1:S45-53.**

**Neuropaediatrics and primary care. Our experience in the 21st century [Article in Spanish]**

López-Pisón J, Pérez-Delgado R, García-Oguiza A, Lafuente-Hidalgo M, Sebastián-Torres B, Cabrerizo de Diago R, Rebage V, García-Jiménez MC, Baldellou-Vázquez A, Arana-Navarro T, Alonso-Martínez V, Mengual-Gil JM, Bastarós-García JC, Peña-Segura JL.

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**INTRODUCTION:** The quality of the health care in a major part of neuropaediatrics benefits from appropriate communication and strategies that have been agreed with primary care (PC) paediatricians. **PATIENTS AND METHODS:** We analyse the children who were assessed in the Neuropaediatric service at the Hospital Universitario Miguel Servet in Saragossa over a period of eight years and we also discuss the most important courses of action followed in the most prevalent problems. **RESULTS:** Eight reasons for visiting accounted for 86% of the total number: paroxysmal disorders (33%), headache (27%), psychomotor retardation (11.5%), alterations affecting the shape or size of the head (5.6%), problems at school and/or attention deficit (4.5%), behavioural disorders (4.25%), gait disorders (3.5%) and perinatal distress (3.4%). The most frequent diagnoses are headaches/migraines (26%), non-epileptic paroxysmal disorders (16.5%), prenatal encephalopathy (10.5%), epilepsy (8%), mental retardation (7.5%), infantile cerebral palsy (4.6%), cryptogenic attention deficit hyperactivity disorder (ADHD) (3.8%) and cryptogenic autism (3.6%). **CONCLUSIONS:** The PC paediatrician working in close relation with the children and their families in all cases is the person mainly responsible for conducting a follow-up on some of the most prevalent problems, such as headaches, many non-epileptic paroxysmal disorders and ADHD. The processes must be established, clearly specified, based on the best evidence, with the participation and within reach of all the professionals involved, in order to favour homogeneity and keep variability in the interventions to a minimum. Channels of communication, including the information and communications technologies, need to be set up to allow health professionals to be permanently up-to-date and capable of controlling their patients in the best possible way.

Publication Types:  
English Abstract

PMID: 18767016 [PubMed - in process]

**14: Rev Neurol. 2008;47 Suppl 1:S25-33.**

**Early care and botulinum toxin. Our experience in the 21st century [Article in Spanish]**

Peña-Segura JL, Marco-Olloqui M, Cabrerizo de Diago R, Pérez-Delgado R, García-Oguiza A, Lafuente-Hidalgo M, Sebastián-Torres B, Rebage V, López-Pisón J.

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**INTRODUCTION:** In neuropaediatrics, the aetiological diagnosis rarely allows a causal treatment to be established. In many cases, all we can offer is referral to early intervention (EI) and botulinum toxin type A (BTA). The only requirement before starting both interventions is a functional or syndromic diagnosis.

**PATIENTS AND METHODS:** Here we analyse the experience gained from an EI programme carried out in the region of Aragon since February 2003 and with the BTA service in the Neuropaediatric Unit of the Hospital Universitario Miguel Servet since November 2003. **RESULTS:** By the end of 2007, 2629 requests had been made for admission to the EI programme and in the year 2007 a total of 702 children were treated. In four years and four months 122 children with infantile cerebral palsy (ICP) were infiltrated with BTA, with positive results in 70% of cases and mild, transient side effects in 13.1%. **CONCLUSIONS:** The children, parents and professionals involved all view EI and BTA with satisfaction. Neuropaediatrics is one of the medical specialties that are best suited to child development and early intervention centres (CDIAT). The neuropaediatrician participates in all the stages of the EI: detection, diagnosis, information and intervention. He or she may act as the coordinating and homogenising element in EI, that is to say, as a link between CDIAT and health care services. Neuropaediatricians are also essential in EI training and education, in family training, information and awareness campaigns, primary care, social services and nurseries. Treatment with BTA cannot be viewed as an isolated technique, but instead as part of a programme in which physiotherapy, orthosis and sometimes surgery play a fundamental role. Coordination among the different professionals involved in treating the child with ICP is absolutely crucial.

Publication Types:  
English Abstract

PMID: 18767014 [PubMed - in process]

**15: Rev Neurol. 2008;47 Suppl 1:S21-4.**

**Botulinum toxin in infantile cerebral palsy [Article in Spanish]**

Póo P, Galván-Manso M, Casartelli MJ, López-Casas J, Gassió-Subirats RM, Blanco C, Terricabras-Carol L.

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**INTRODUCTION:** A number of studies have proved the effectiveness and safety of botulinum toxin in therapeutic doses. **AIM:** To analyse the results obtained over a 12-year period in which botulinum toxin type A (BTA) was used to treat infantile cerebral palsy (CP). **PATIENTS AND METHODS:** Of a total number of 547 patients who were treated, 515 had CP, 464 with spasticity, 46 with mixed CP and 5 with dyskinetic CP with focal dystonia. **RESULTS:** Overall evaluation of BTA is positive, both as regards its beneficial effects and its safety: tone was mildly improved in 18.5% of patients, with no change in motor functioning, 39% showed a moderate improvement, 19% a marked improvement and 5.6% experienced a marked and prolonged improvement. Forty-two patients (8.15%) presented side effects, the most common being weakness in the lower limbs, which occurred in 21 cases. **CONCLUSIONS:** BTA is a good therapeutic option for treating children with CP, not only for the focal involvement but also as palliative treatment in children with diffuse involvement.

Publication Types:  
English Abstract

PMID: 18767013 [PubMed - in process]

**16: Rev Neurol. 2008;47 Suppl 1:S15-20.**

**Infantile cerebral palsy: the importance of population registers [Article in Spanish]**

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**INTRODUCTION:** Cerebral palsy (CP) is the most common cause of motor disability in the paediatric age. For several decades, a number of developed countries have kept registers that have been used to conduct population-based studies of CP. **AIM:** To determine what methodology is needed to keep a register of CP and in what ways it can be applied. **DEVELOPMENT:** CP registers came into being as a means to monitor the prevalence of CP. Today they have become useful tools for organising health care services, conducting aetiological studies on CP, evaluating therapeutic interventions and assessing patients' quality of life. Setting up a register involves having an aim and a set of eligibility/exclusion criteria that have both been clearly defined beforehand. The quality of the register depends on its continuity, which means that there must be economic and human resources available to ensure long-term planning and the constant incorporation of new patients. Projects that are coordinated among several centres provide a greater study population and favour the utilisation of a common terminology. **CONCLUSIONS:** The deficits associated to CP, together with its chronicity and the medical, social and educational implications it gives rise to, make it an extremely important health issue today. The ultimate aim of studies on CP should be to improve patients' quality of life and promote their full integration into the world around them.

Publication Types:  
English Abstract

PMID: 18767012 [PubMed - in process]



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