Oral Presentations

OP-01.1
Guiding service delivery and monitoring change in pupils with a severe acquired brain injury: the school function assessment

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Objective: To demonstrate how the School Function Assessment's (SFA) guides service delivery and monitors change during residential rehabilitation for pupils with a severe acquired brain injury. Enabling pupils to return to a school environment is a major aim of residential rehabilitation programmes combining therapy and education requiring effective assessment and outcome measures.
Methods: Seventy pupils with severe acquired brain injuries (ABI) admitted between January 2007 and October 2011were included (31traumatic [TBI], 29 non-traumatic, 10 anoxic [ANOXABI]); 42 male, aged 4.5–17.2 years (Mean 12.2; SD 3.5). Data were analysed using non-parametric statistics: Wilcoxon test for group differences in Participation, Task Supports and Performance; Kruskal–Wallis to determine between-group differences in age, time post-injury and weeks in rehabilitation. Significance level set at $p<0.05$.
Results: The SFA identified participation levels and monitored changes. There were no significant differences in weeks in rehabilitation between non-traumatic and TBI but the ANOXABI group spent longer in rehabilitation ($p=0.03$). There was no age difference between non-traumatic and ANOXABI groups but the TBI group were significantly older ($p=0.001$). There was no significant difference in time post injury on admission between groups ($p=0.35$). Significant differences ($p<0.05$) were found between admission and discharge for participation, task supports and performance in the non-traumatic and TBI groups, but not for the ANOXABI group ($p>0.05$).
Conclusions: The SFA shows clinically and statistically significant differences between admission and discharge for TBI and non-traumatic groups but not ANOXABI. The SFA provides information for discharge planning and provision of future services in a school environment.

OP-01.2
Neonatal arterial ischemic stroke in Switzerland

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Objective: To describe the characteristics and epidemiology of neonatal arterial ischemic stroke (AIS) in Switzerland.
Methods: Data on clinical manifestation, neuroimaging, risk factors (RF's), and treatment procedure were gathered prospectively for all neonates diagnosed with AIS and born in Switzerland between 2000 and 2007. A re-evaluation of available neuroimaging studies was performed by two experienced investigators. Clinical follow-up assessments were performed. Predictors of poor outcome (including symptoms, infarct characteristics, RF's and treatment) were determined.
Results: Seventy-nine neonates (53 boys, 26 girls) have been reported. The incidence of neonatal AIS in Switzerland was 14 per 100 000. Seizures were the most common symptoms (91%). RF's including maternal conditions, birth complications, neonatal comorbidities and prothrombotic states were found in 77%. Eighty percent had unilateral lesions (80% left-sided) and 20% had bilateral lesions. The anterior circulation (mainly the medial cerebral artery) was mostly involved (85%). At follow-up (mean 6mo) 41% showed hemiplegia and 26% received anticonvulsant medication. Respiratory symptoms at presentation (OR 5.580, 95% CI 1.104–28.203, $p=0.038$), muscle tone abnormalities at presentation (OR 2.032, 95% CI 1.001–8.588, $p=0.050$) and the presence of neonatal comorbidities (OR 2.932, 95% CI 1.001–8.588, $p=0.050$) were significant predictors of poor outcome in an univariate regression

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doi: 10.1111/j.1469-8749.2012.04297.x

analysis. No variable remained significant in a multivariate analysis.

Conclusions: Neonatal AIS often present with seizures but can be pauci-symptomatic. Missing significance for an outcome predictor is most likely due to the multi-factorial ethiology and pathophysiology of neonatal stroke. As a result larger scale multicenter case-control studies are mandatory.

OP-02.1
Iron deficiency anaemia (IDA) in children with ADHD

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Objective: To determine whether children with ADHD are at risk of Iron deficiency anaemia (IDA).

Methods: We reviewed all case files, electronic records and laboratory results (Serum Iron, Ferritin and Full blood count) of 100 children with ADHD. Forty cases were suspected to have IDA from history and clinical findings. Only 38 cases were included as two blood samples clotted.

Results: Two children were female and 36 male, with ages ranging 4–14 years (median 7y). 92% had ADHD and 8% had Attention Deficit Disorder (ADD) (Figure 1). Fifty-five percentage had sleeping difficulties, 32% learning difficulties and 13% had Autistic spectrum disorder (Figure 2). Seventeen had poor appetite, two poor weight gain, one food allergy, one nut allergy and eight had significantly reduced appetite on medication (Figure 3). Serum Ferritin was low in 50%, the lower limit for Ferritin being 30μg/mL in males and 13μg/mL in females in our laboratory. Serum Iron and transferrin saturation were low in 32% and 45% respectively. Full blood count was abnormal in 42%, with MCV low in 40%. (Tables 1–3).

Conclusions: IDA is observed in 8–12% of children in UK. However, in our cohort of children with ADHD, we have observed an increased proportion of IDA. Had we used a higher limit of Ferritin (50μg/mL) as in previous studies, we would have identified even more cases. However larger, well-designed prospective studies are now indicated to study this phenomenon in more detail. It is useful to screen children with ADHD for iron deficiency anaemia and offer treatment.

OP-04.1
Different restless legs syndrome/Willis Ekbom disease (RLS/WED) phenotypes. A missed co-morbidity in children and youths with neurodevelopmental disorders that can aggravate challenging behaviour?

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Objective: Sleep related day- and night-time symptoms may not be recognized or may be missed in children with neurodevelopmental disorders/disabilities (NDD/D), as NDD/D are usually associated with challenging behaviour and insomnia. Results of sleep assessments suggest that optimizing our clinical understanding before triaging patients for further diagnostic/therapeutic care would be helpful.

Methods: We used an ethnographic approach to explore parent(s)/caregiver(s)' perceptions of 'challenging behaviour' and of sleep problems (SP). In addition, we developed and piloted home-based over-night-video-sleep-studies to clinically understand and describe SP.

Results: We are presenting day- and night-time related symptoms and behaviours in 15 children and youths (2–17y) with global developmental delay or intellectual disability with familial RLS/WED and diagnoses like autism spectrum disorders, cerebral paresis, and additional syndromes (e.g. Trisomy-21, cri-du-chat). The challenging behaviours of these patients were given diagnoses such as attention deficit hyperactive, anxiety, obsessive compulsive disorders. However, RLS/WED-related discomfort/urge-to-move/pain had been missed. We identified RLS/WED as one main cause of both insomnia and aggravated challenging behaviour over the day. At quite a young age these children have developed movement-based adaptive strategies to overcome difficulties in sitting still and falling asleep. These strategies range from subtle to quite extreme and can even result in passing out from exhaustion, hiding typical well-known symptoms that may indicate RLS/WED.

Conclusions: History and analysis of behavioural patterns in conjunction with family sleep history seem to be a key in understanding RLS/WED of patients with NDD/D. These observations open our understanding of SP causality and diagnostic/therapeutic options.

OP-06.1
Exploring the physical management of children with cerebral palsy in the mainstream primary school setting

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Objective: When children with cerebral palsy (CP) attend a mainstream school, their physical functioning often impacts on school activities and on active participation. In the UK, education and health policies advocate a multi-agency approach to meet a child's special educational needs (SEN) and their inclusion within the mainstream school system. Therapists work with school staff to promote a child's activity and participation, and deliver therapeutic interventions within this environment. There has been little research into the detail of how this might be achieved for children with a physical disability. This study aimed to explore how the physical function and inclusion of a child with CP are promoted within the mainstream school environment.
Methods: A case study approach was utilised to generate in-depth contextual knowledge of the issues faced when managing a child with a physical disability. Three individual cases were studied using a multiple-method design: observation, interviews and documents. Thematic analysis utilised an inductive approach with data from different sources.
Results: Three main themes emerged: impact of the SEN educational framework on collaborative practice; the delicate balance of participation; and how attitudes towards difference affect a child's management. Important factors influencing participation and promotion of physical function include support in school, utilisation of equipment and classroom practice.
Conclusions: This study highlights the need for an individual approach to each child within their school context. A more collaborative approach is necessary to maximise physical function and participation, integrate therapeutic goals and involve a child in the daily decisions impacting on their life in school.

OP-06.10
Development of the mini-AHA: a new test measuring how effectively young children with unilateral cerebral palsy use the affected hand in bimanual performance

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Objective: The Mini-AHA assesses use of the affected hand during bimanual play in children 8–18 months with unilateral CP using toys that provoke bimanual hand use. Construct validity for the play session was evaluated by testing the frequency that typically developing children used bimanual actions to handle the toys, whether the toys elicited all expected bimanual actions in this age range, and whether there was a positive relationship between severity of impairment in children with unilateral CP and frequency of play using two hands. We also aimed to create a trial version of the Mini-AHA test items and scoring criteria.
Methods: Forty typically developing children and 30 children with unilateral CP grouped by severity of impairment were recruited. Thirty toys selected to provoke bimanual hand use in children 8–18 months were trialled. Analysis of the play sessions determined suitability of the current AHA test items to score effectiveness of the affected hand during bimanual performance and/or generate new items.
Results: The toys provoked bimanual play actions in typically developing children 99% of the time ($p<0.001$). All expected bimanual actions were observed across the age range. The ability of children with unilateral CP to play using bimanual actions varied according to the child's severity level. Eleven AHA test items could be scored in this age group, four items required revision, seven items were not suitable, and seven new items were generated.
Conclusions: Validity of the play session to provoke bimanual play was supported. Twenty-two Mini-AHA test items for children aged 8–18 months were generated.

OP-06.11
Recurrent musculoskeletal pain in paediatric cerebral palsy: relations to participation as reported by parents

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Objective: To explore the contribution of recurrent musculoskeletal pain (RMP) to aspects of participation in children with cerebral palsy (CP) in a participation model including additional impairments and family factors.
Methods: Design was cross-sectional. One hundred and five children (54 males, median age 14y) participated. CP type distribution was unilateral spastic 37%, bilateral spastic 56% and dyskinetic 7%. GMFCS levels were I 33%, II 40%, III 15% and IV–V 11%. Participants were assessed with interview on recurrent pain, clinical examination and questionnaires. Parents reported child participation on Assessment of Life Habits (LIFE-H), child mental health on the Strengths and Difficulties Questionnaire (SDQ), socio-economic status, and own mental health on the General Health Questionnaire (GHQ).

Results: Fifty-two percentage of children experienced RMP related to CP. Children with RMP had significant lower LIFE-H scores on all four outcomes. Associations with statistical significance ($p<0.05$) in the final multivariable analyses are listed in table 1.
Conclusions: Pain and mental health should be considered in models assessing participation of children with CP. Regarding participation as an objective outcome measure is questionable.

OP-06.13
Training of motor functions among pre-schoolers with cerebral palsy: a survey among parents in Norway

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Objective: To describe training of motor functions among pre-schoolers with cerebral palsy (CP) in Norway, and assess parent-rated benefits in relation to CP characteristics, frequency of training, use of goals, and parent involvement.
Methods: Survey among parents of pre-schoolers with CP (n=360) and data from the Norwegian CP follow up program. Responds rate 34%.
Results: No significant differences between participants and non-participants regarding age, type of CP and GMFCS level were found (p=0.15–0.85). Among the participating children, 86.4% had additional problems, of those, 43% five or more. Most children conducted gross and fine motor training, and stretching (72–80%), the majority 3 t/week or more (89–93%) and 32–51% several times a day. The training was highly goal-related (79–89%) and at least half of the parents (50–65%) took part. Gross motor training performed more than twice/week showed a tendency of higher parent evaluated benefits (p=0.01). Such differences were not found for hand function and stretching. Goal-related training of fine- and gross motor function, and stretching was related to higher parent-rated benefits (OR 7.9, CI 1.9–32.6; OR 6.5, CI 1.8–23.5; OR 26.4, CI 6.5–106.6). Neither CP characteristics, nor frequency of training or parents' involvement were related to benefits.
Conclusions: The majority of pre-schoolers with CP trained goal-related motor functions at least three times a week with high degree of parent involvement. Goal-related training tended to be associated with higher benefits.

OP-06.14
Modified constraint-induced movement therapy combined with bimanual training (Mcımt-Bit): benefits are retained 1 year after the pirate group intervention

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Objective: We evaluated the long-term effects of modified constraint-induced movement therapy combined with bimanual training (mCIMT-BiT) in children with unilateral spastic CP. Until now, there is only one study that presented treatment effects of pediatric constraint-induced movement therapy (CIMT) beyond 6 months post intervention. We previously reported on the efficacy of mCIMT-BiT in the Pirate group up to 2 months post intervention and now present the long-term results at 6 months and 1 year post intervention.
Methods: In a randomized controlled trial for children with unilateral spastic CP, aged 2.5–8 years, we compared mCIMT-BiT (n=28) to conventional therapy (n=22) of equal intensity and duration. Follow-up assessments at 6 months were attended by all participants. At 1 year follow-up, only 23 children from the mCIM-BiT group (89%) participated. Primary outcome measures were Assisting Hand Assessment and ABILHAND-Kids. Secondary outcomes were Melbourne Assessment of Unilateral Upper Limb Function (Melbourne) and Canadian Occupational Performance Measure (COPM). At 1 year, only the primary outcomes and the COPM were administered. To determine long-term effectiveness, we used repeated-measures ANOVA to test within-group differences.
Results: Compared to the immediate post intervention results there were no significant differences for any of the outcomes at 6 month and 1 year, except for the Melbourne that showed a significant further improvement at 6 months (F=7.252, df=1, p=0.012).
Conclusions: The results indicate that the beneficial effects of mCIMT-BiT in young children with unilateral spastic CP are retained at 6 months and 1 year post intervention.

OP-06.15
Participation in formal and informal activities in children and adolescents with cerebral palsy in Spain and the Netherlands

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Objective: As participation is thought to be influenced by environmental factors such as where children live, findings may differ from one country to another. This study will enable us to identify if there are differences between the diversity of participation in formal and informal activities in children and adolescents with Cerebral Palsy (CP) who live in Spain and the Netherlands.
Methods: The participants of this cross sectional study were 149 children and adolescents with CP (114 in Spain [43 females and 71 males, mean age 12.2y, range 8–18y] and 35 in The Netherlands [17 females and 18 males, mean age 13.1y, range 8–18y]) who completed the Children's Assessment of Participation and Enjoyment (CAPE) in its Spanish and Dutch version, respectively. Student *t*-tests for independent sample and multiple linear regression were used in the analysis.
Results: The Spanish sample presented higher diversity scores in the formal domain ($p \leq 0.01$) while no significant differences were found in the informal domain. The regression model that included the child variables (age, gender, IQ level and GMFCS level), type of school and country, explained only 10% of the variance in the formal domain and only 13% in the informal domain. The variable country was significant only for formal activities, where Spain scored significantly higher than the Netherlands (β.352).
Conclusions: The differences between the two countries regarding diversity of participation in formal activities may be due to culture and environment, as predicted by the social model of disability.

OP-06.16
Manual Ability Classification System (MACS); evidence of stability over time

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Objective: MACS describes how children with cerebral palsy (CP) use their hands when handling objects in daily life. If children's MACS level is shown to be stable over time the classification could be used for predictive purposes. The objective was to evaluate the stability of MACS levels over time for children with CP.
Methods: In this prospective study 1 268 children with CP were followed from 2005 to 2010 with two or more registered MACS classifications rated at least 1 year apart. Thirty-five percent of the children (n=446) had four ratings. Children were between 4 and 17 years old (mean 6y 6m, SD 2y 11 m) at their first rating, 59% were boys, and all MACS levels I-V were represented. The percentage of children remaining in the same level during 4 ratings was calculated. Children's first and second ratings (n=1268) as well as first and last ratings (n=446) were compared. Stability of the levels for children aged 4 years when first classified were compared with children aged 10 years at the first classification.
Results: Seventy percent of the children with four ratings remained in the same classification level. The absolute agreement was 81% between children's first and second rating and 76% between first and fourth rating. An ICC of 0.96 in the group of children with four ratings indicated excellent chance corrected agreement. No difference of stability was seen for different age groups (ICC 0.96 in both groups).
Conclusions: Results of this study provide evidence of stability of MACS levels for children with CP.

OP-06.17
The association between participation in life situations of children with cerebral palsy and their physical, social and attitudinal environment: a cross-sectional multi-centre European study

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Objective: To evaluate how participation of children with cerebral palsy varied with their environment.
Methods: Thousand one hundred and seventy-four children aged 8–12 years were randomly selected from eight population-based registers of children with cerebral palsy in six European countries. Seven hundred and forty-three (63%) agreed to participate; one further region recruited 75 children from multiple sources. These 818 children were visited by researchers who administered to parents the Life-H questionnaire to assess participation, and the European Child Environment Questionnaire to assess the child's physical, social and attitudinal environment. Structural equation modelling was used to model putative associations between specific domains of participation and environment, while allowing for the severity of the child's impairments and pain.

Results: For these hypothesised associations, the models confirmed that higher participation was significantly ($p<0.01$) associated with better availability of environmental features. A better physical environment at home was associated with higher participation in daily activities – mealtimes, health hygiene, personal care and home life. Mobility was associated with transport and the physical environment in the community. Participation in social roles (responsibilities, relationships, recreation) was associated with attitudes of classmates and with social support at home. School participation was associated with attitudes of teachers and therapists. Environment explained between 14% and 35% of the variation in participation.
Conclusions: The findings confirmed the social model of disability. Modification of the physical, social and attitudinal environment of disabled children could substantially facilitate their participation in everyday activities and social roles.

OP-06.2
Development of a functional classification system of eating and drinking ability for individuals with cerebral palsy

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Objective: Disorders of movement and posture associated with cerebral palsy (CP) often lead to difficulties with feeding, eating, drinking and swallowing. Consequences to health of compromised eating and drinking skills include respiratory disease, due to food and fluid entering the lungs, and malnutrition leading to poor growth and health. There is no agreement on severity ratings for eating and drinking difficulties, the terms used and whether focus should be at the level of impairment, function, activity or participation. Our aim is to develop a valid and reliable classification system of the functional eating and drinking abilities of individuals with CP, with reference to other functional classification systems such as the GMFCS and MACS.
Methods: We developed a classification system using an iterative process (Figure 1). We drafted an initial system from clinical experience, current literature and assessments. The system was examined and further developed in seven Nominal Groups comprising a total of 56 invited UK experts. A Delphi Survey of the resulting tool (Figure 2) is currently underway with a wider group of 77 experts around the world (Table 1). Further rounds will be undertaken until 80% consensus is reached. In the final stage, we will determine the inter-rater reliability of the system. Cohen's Kappa will be calculated as a measure of the agreement between pairs of raters.
Results: Delphi Round 1 has shown consensus for 39 of 42 statements representing system content (Table 2). This presentation will report the first three stages of the study, up to and including the Delphi.

OP-06.3
Mental health problems in children and adolescents with cerebral palsy: predictors, impact on family burden and quality of life

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Objective: Children with cerebral palsy (CP) are at an increased risk for mental health problems. The aims of the present study were to examine (1) the influence of neurological status, neuroradiological findings and psychosocial risks on the outcome concerning mental health, and (2) the impact of mental health on family burden and quality of life for these patients.
Methods: Two hundred and eleven children with CP (aged 4–16y) were included in a multicenter cross-sectional study. The strength and difficulties questionnaire (SDQ), a parental burden questionnaire (FaBel), and a health related quality of life questionnaire (Kindl) were completed by the parents. These data were correlated with the neurological status (type of CP, GMFCS-, MACS – levels) and with the pathogenesis of the CP as derived from neuroradiological findings.
Results: The total difficulties score in SDQ was significantly increased in the children with CP (26% vs 10% in German norm population). Peer problems (35.5%) and hyperactivity (25.1%) were predominant (German norms 7% and 9.8% resp.). These findings correlated significantly with parental burdens and decreased quality of life of children with CP. Neurological status and neuradiological findings played an important role in the pathogenesis of mental health problems of children with CP.
Conclusions: Our findings confirm the results of previous epidemiological studies (e.g. Parkes et al., 2008). We demonstrate the role of neurological status, pathogenesis of CP and psychosocial factors for mental health problems of children and adolescents with CP. Consequences of these data for interdisciplinary clinical diagnostics and therapeutic management are discussed.

OP-06.4
Determinants of self-reported quality of life of adolescents with cerebral palsy: a longitudinal European study (SPARCLE 2)

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Objective: How does the quality of life (QoL) of 8–12 year old children with cerebral palsy (CP) change as they become adolescents; and how much do pain, parental stress and psychological problems in childhood determine adolescent QoL?

Methods: In the European study SPARCLE, 355 children with CP, who had self-reported their QoL as children (8–12y), were visited again as adolescents (13–17y). QoL was assessed with KIDSCREEN-52. The influences of pain, parental stress (Parental Stress Index) and psychological problems (Strengths and Difficulties Questionnaire) in childhood, and their change between childhood and adolescence, on each of the ten KIDSCREEN domains were examined using linear regression models.

Results: By adolescence, QoL remained stable in three KIDSCREEN domains, but had decreased in five. Higher QoL in childhood predicted higher adolescent QoL in all domains except financial resources. Pain in childhood did not predict adolescent QoL. Higher parental stress and more psychological problems in childhood predicted lower adolescent QoL in six and five domains respectively. In general, where stress and psychological problems worsened between childhood and adolescence, the above associations were even stronger. Worsening pain was associated with lower adolescent QoL on six domains. Each of the three regression models for pain, stress and psychological problems explained about one fifth of the variability in adolescent QoL.

Conclusions: QoL remains stable in some domains, but decreases in most as children with CP move from childhood to adolescence. Parental stress and psychological problems in childhood, both amenable to intervention, are strong predictors of adolescent QoL.

OP-06.6
Direction-specific postural adjustments during reaching increase with age in typically developing infants but not in infants at high risk for cerebral palsy

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Objective: Complex postural adjustments form the basis for optimal performance of voluntary arm movements. A basic feature of postural control is direction-specificity: reaching movements inducing forward body sway are accompanied by primary activation of dorsal muscles. Little is known on direction-specificity in infants at high risk for cerebral palsy. We aimed at investigating direction-specificity during reaching in infants at high risk for cerebral palsy (HRCP).

Methods: Twenty-five HRCP-infants and 11 TD-infants were assessed at 4, 6, and 18 months. Reaching movements were elicited in seated infants. Surface EMG was recorded of arm, neck and trunk muscles. Percentage of trials with direction-specific adjustments (dorsal muscle activation before or without ventral muscle activation) was computed at neck and trunk level.

Results: TD-infants had direction-specific adjustments at 4, 6 and 18 months in the trunk in 63%, 61% and 86% of trials (6 vs 18mo: p=0.006). Corresponding values in HRCP-infants were: 57%, 57%, 62% (TD vs HRCP at 18mo: p=0.02). Direction-specificity in the neck occurred in 44–50% of the trials throughout infancy in TD-infants and HRCP-infants, except at 6 months (HRCP: 30%, TD: 50%, p=0.012). Direction-specificity at neck and trunk occurred significantly less often in HRCP-infants than in TD-infants from 6 months onwards (at 4, 6 and 18mo: TD 44%, 46%, 57%; HRCP 25%, 25%, 22%; 6mo: p=0.013, 18mo: p=0.050).

Conclusions: Initially basic postural control of HRCP-infants is similar to that of TD-infants, but from 6 months onwards a difference emerges: HRCP-infants lack the significant increase in direction-specificity of typical development.

OP-06.7
Precision of manual technique intramuscular needle placement verified with electrical stimulation during BoNT-A treatment in children with spastic cerebral palsy

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Objective: Intramuscular injection of BoNT-A given by manual technique intramuscular needle placement (MT) under general anaesthesia is an established treatment and standard of care to manage spasticity in children with spastic cerebral palsy (CP). Optimal needle placement is essential. The aim of this study is to describe the method, design and detailed protocols of MT for each muscle separately verified with electrical stimulation (ES) during BoNT-A treatment in children with spastic CP and to investigate its precision.
Methods: Patients: children with spastic CP, aged 4 to 18 years, receiving BoNT-A treatment under general anaesthesia to improve mobility, are recruited from the Department of Paediatric Rehabilitation Medicine, VUmc, Amsterdam. For each muscle a specific MT protocol is developed. MT in the intended muscle is classified as true or false by stretching the muscle and directly after verified as true or false with ES.
Results: Seventy-five children, 53 boys and 23 girls, with a mean age of 8.72 SD 3.57 and a mean body-mass-index of 16.2 SD 3.7 are recruited. A total of 1097 MT in the adductor-brevis-muscle, adductor-longus-muscle, biceps-lateralis-muscle, biceps-medialis-muscle, biceps-femoris-muscle, gastrocnemius-lateralis-muscle, gastrocnemius-medialis-muscle, soleus-muscle, gracilis-muscle, semimembranosus-muscle, semitendinosus-muscle and the rectus-femoris-muscle are verified with ES. There are not enough data assembled for the biceps-muscle and soleus-muscle to compute all statistics. MT of all different muscles and 12 muscle injection sites show a minimum positive-predictive-value of 80% and a reliability of 95% with a lower bound of 70%.
Conclusions: MT is a precise method for intramuscular needle placement in most muscles of the lower limb.

OP-06.8
Evaluation of botulinum toxin effects in cerebral palsy cases with plantar flexion spasticity using gait analysis

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Objective: Plantar flexion spasticity is one of the important causes of the walking disorders in Cerebral Palsy (CP). Botulinum Toxin-A (BoNT-A) can be used for medical treatment in these cases. The aim of this study is to evaluate the effects of BoNT-A used under ultrasound (U/S) on Gastrocnemius and Soleus muscles for treatment of plantar flexion spasticity using Gait Analysis.
Methods: Fifteen Diplegic CP cases treated with BoNT-A between 2009 and 2010 were evaluated in this study. Age distribution was from 2 to 17 (mean 6.86). The cases were evaluated in terms of Initial Contact Phase and Midstance Phase of the ankle in Acibadem University, School of Medicine, Kozyatağı Hospital, Gait Analysis Center. Required BoNT-A doses were performed bilaterally on Gastrocnemius and Soleus muscles under U/S. After the BoNT-A practise physiotherapy exercise program was given to the cases for 6 months. At the end of the program the cases were evaluated once again in the Gait Analysis Center. Wilcoxon test was used for the statistical analysis of the results.
Results: After 6 months ankle plantar flexion angles bilaterally showed a significant improvement on Gait Analysis (p=0.001).
Conclusions: Detailed improvement in combined treatment with BoNT-A and physiotherapy exercise program for ankle plantar flexion spasticity can be demonstrated on Gait Analysis. Gait Analysis is an effective method in terms of demonstrating medical treatment improvements objectively.

OP-06.9
The influence of cognitive factors on the development of arithmetic performance of primary-school children with cerebral palsy

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Objective: We will examine the arithmetic development of primary-school children with a cerebral palsy (CP) over a period of 3 years. In addition, we will explore cognitive factors that are associated with the initial status and growth

rate of arithmetic performance. The arithmetic performance of children with CP has received only scant attention. This is remarkable considering the high prevalence of learning problems among these children, especially in arithmetic compared to reading. We will investigate the influence of non-verbal intelligence, working memory and word decoding skills on addition and subtraction problems. The results of this study will provide a starting point for intervention and remediation programs.

Methods: Seventy children diagnosed with CP participated in this study. The average age was 7.18 (SD=0.23) at the first measurement. Standardized tests were administered to assess arithmetic performance, non-verbal intelligence, working memory and word decoding skills. Structural equation modeling was used to investigate the research questions.

Results: We found a linear increase in arithmetic performance of children with CP. However, the growth became smaller between 8 and 9 years of age. Non-verbal intelligence and working memory were positively associated with the initial status and the development of arithmetic performance. Word decoding skills were only positively related to the initial status of addition and subtraction problems.

Conclusions: This study shows that non-verbal intelligence, working memory and word decoding skills influence the arithmetic performance of primary-school children with CP. Remediation should therefore be aimed at increasing these skills, which could facilitate the arithmetic performance of these children.

OP-09.1
Measuring the impact of childhood visual disability

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Objective: To develop instruments measuring self-reported functional vision (FV) and vision-related quality of life (VQoL) of visually impaired (VI) children. The concepts of FV and VQoL are often used interchangeably by clinicians. We propose that distinct measures of FV and VQoL, grounded in the children's perspectives, would complement objective clinical measures and provide a comprehensive assessment of the impact of visual disability.

Methods: We conducted 32 semi-structured interviews with VI children aged 10–15 years to elicit their views of living with a visual disability. Collaborative qualitative thematic analysis was applied to describe the themes of concern and define the structure of the two instruments. Draft items were derived using verbatim statements. VI children were consulted individually and in expert reference groups to finalise instrument content and format

Results: Six notional themes provided the initial structure for organising interview statements (Rahi et al., 2011). Statements from the 'Functioning: home, school &leisure' theme evolved into items for the FV instrument (a 56-item, 5-point response scale capturing the 'level of difficulty' in performing a particular activity). The remaining statements provided items for the VQoL instrument, across the themes of Social Functioning, Psychological Well-being and Independence (a 39-item, 4-point response scale capturing the 'self-discrepancy' between the actual and ideal self, Eiser et al., 2000).

Conclusions: Individual interviews with children enabled us to capture their perspectives of living with a visual loss and to operationalize them in the form of two distinct but complementary measures. The formal evaluation currently underway will add value to assessments in routine clinical practice and afford affected children a voice in health-care decision making.

OP-10.1
Association between childhood intractable epilepsy and interleukin 1 beta and interleukin 1 receptor antagonist gene polymorphisms

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Objective: We attempted to investigate whether interleukin 1 beta (IL-1β) and interleukin 1 receptor antagonist (IL-1 Ra) gene polymorphisms can be used as an early predictor for childhood intractable epilepsy or not.

Methods: We determined the allele frequencies of IL-1β -511, +3953 and IL-1 Ra VNTR polymorphisms in two groups. First group was intractable epilepsy group (IE) which includes 200 intractable epileptic children of Turkish ancestry; second group was drug responsive epilepsy group (DRE) which includes 208 drug responsive epileptic children. Both of the groups were compared with 201 ethnically matched control subjects (HCs). Polymorphisms were detected with polymerase chain reaction.

Results: Although no statistically significant difference was noted for IL-1β -511 and +3953 allele frequencies between IE and DRE groups; IL-1β -511 allele 2 and IL-1β +3953 allele 2 frequencies were significantly higher in both IE and DRE groups compared with HCs. On the other hand, frequencies of IL-1 Ra allele 2 and 3 tended to be higher

in DRE group compared with IE group and fruthermore IL-1 Ra allele 1 frequency was significantly higher in the IE group compared with DRE group.
Conclusions: Our data suggests that IL-1β -511 allele 2 and +3953 allele 2 can not be provided as an early predictor of intractability but these alleles may act as a strong susceptibility factor for epileptogenesis. Moreover, IL-1 Ra allel 2 and 3 are associated with a depletion in the risk of intractability, although allele 1 seems to be a strong susceptibility factor for intractability of childhood epilepsy.

OP-12.1
Development of a novel outcome measure for paediatric neurodisability: the parental understanding of neurodisability questionnaire (PUN-Q)

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Objective: To develop a scientifically validated tool to measure parental understanding of their child's neurodisability. Few standard outcome measures are available for evaluation of specialist paediatric neurodisability services; a robust measure which is sensitive to change in the status of the parent or child is needed. A brief self-rating measure of parent's understanding of their child's neurodisability (PUN-Q) that meets psychometric criteria for reliability and validity is therefore developed.
Methods: Cross sectional study with qualitative / quantitative methodology, including item generation, piloting and psychometric validation of the new measure. Validation stage included consecutive sample of 50 parents who had recently attended a paediatric neurodisability service where they received a diagnosis of autism. Self rating questionnaires were sent by post to the parent, including PUN-Q and standard measures of parental competence, parental stress and factual knowledge of autism.
Results: The PUN-Q was found to have high internal reliability (α=92). Exploratory factor analysis produced three factors explaining 67% of variance: practical understanding, insightful understanding and shared understanding (negative pole). As predicted theoretically, higher rating on PUN-Q (and two main factors) positively associated with parental competence (p<0.005), negatively associated with parenting stress (p<0.005) and weakly associated with factual knowledge.
Conclusions: A novel measure for rating parental understanding of their child's neurodisability was shown to have good psychometric properties including internal reliability, latent constructs and convergent and discriminant validity. Future plans to test the PUN-Q pre and post-diagnostic intervention will be discussed, towards final development for a workable outcome measure.

OP-12.2
Effects of hip, knee, ankle and foot orthosis with spring on walking pattern in children with spastic diparesis and internal rotation of lower limbs

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Objective: Cerebral palsy (CP) is a well-recognized neurodevelopmental non-progressive condition. Children with CP in GMFCS levels I. to III. are able to walk, Gait patterns however are very diverse. There are not many data on possible effects of hip, knee, ankle and foot orthosis (HKAFO) with spring on walking pattern in child with spastic diparesis. The aim of study was to find out whether it is possible to influence the gait pattern with internal rotation of lower limbs and hyperextension of knee by a specially designed orthosis.
Methods: We present a series of 11 children, using the orthosis for more than 18 months. Body hight, weight, passive range of movement, clinical and computer gait analysis was done several times to record changes and follow up the gait pattern.
Results: Clinical and computer gait analysis showed that gait patternin the follow-up period is more symmetrical, with less pronounced internal rotation of lower limbs. Results of correction of hyper-extension of knees were not significant. A small number of children with low muscular power in pelvis and hip region were not able to benefit from orthosis.
Conclusions: Based on these results we could say that application of HKAFO was successful for children with rather good muscular power. We should be able to select children better in the future and we would need a longer period of follow up to find out for how long time these positive effects would be still evident, even after the children would stop using the orthosis.

OP-14.2
The prevalence and early spontaneous course of idiopathic toe-walking in 5-year-old children

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Objective: The prevalence and natural history of Idiopathic toe-walking (ITW) in healthy children is previously

unknown. In this study we aimed to establish the prevalence of ITW in a large population based cohort of 5.5-year-old children.

Methods: We performed a cross-sectional prevalence study of all 5.5-year-old children living in Blekinge County, Sweden. Children were assessed when examined at the regular '5.5-year-visit' to the local Child Welfare Centre. Assessment included taking a history of present or past toe-walking and active toe-walkers were neurologically examined to confirm ITW. Additionally, all 5.5-year-old children (*n*=35) admitted to the Clinic for children with special needs were assessed.

Results: Of the 1436 children in the cohort (750 boys, 686 girls), 30 (2.1%, 20 boys and 10 girls) still walked on their toes at age 5.5-years and were considered as active toe-walkers. Forty children (2.8%, 22 boys and 18 girls) had previously walked on their toes but had stopped before the '5.5 visit' and were considered as inactive toe-walkers. At age 5.5-years, the total prevalence of toe walking was 70/1436=4.9%. For children with a neuropsychiatric diagnosis or developmental delay the total prevalence for active or inactive toe-walking was 7/17=41.2%.

Conclusions: This study for the first time establishes the prevalence and early spontaneous course of ITW in 5.5-year-old children. More than half of the children have already spontaneously ceased to walk on their toes at his age. In addition the study confirms earlier findings that toe walking has a high prevalence among children with a cognitive disorder.

OP-14.3
Do children participate in the activities they prefer? Preference versus performance

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Objective: Preference for activities has been identified as an important determinant of participation in leisure activities. High preference for activities but not being able to engage in them could have a negative impact on children. The aim of this study was to assess difference between children with and without physical disabilities in the discrepancy between the activities they want to engage in (preference) and the activities they actually do (performance).

Methods: One forty-one children (age range 6–18y) with a physical disability (mean age 12.5, 42.6% girls, 57.4% boys) and 156 children without physical disabilities (mean age 11.5, 54.5% girls, 45.5% boys) completed the Children's Assessment of Participation and Enjoyment (CAPE) and the Preferences for Activities of Children (PAC). A discrepancy score was calculated for each of the activity types representing high preference but no performance within 4 months prior to the assessment.

Results: There was no difference in discrepancy scores between children with and without physical disabilities. Discrepancy between preference and performance varied by age and gender for children without disabilities but not for children with disabilities.

Conclusions: Although children with physical disabilities are known to participate in a significantly lower number of activities there does not seem to be a larger discrepancy between what they prefer and actually do compared to children without disabilities. Apparently children with physical disabilities alter their expectations of what they are able to do and as a result of that adapt their preferences. More research is needed to identify determinants of preference of children with physical disabilities.

OP-14.4
Effects of preterm birth on brain maturation and movement performance in 7–9-year-old children

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Objective: To investigate the associations between brain volumes and spatiotemporal properties of goal-directed upper-limb movements in relation to perinatal factors in preterm born children. Recent follow-up studies of children born preterm have generally found worse sensory-motor performance at school age in comparison to term born children. Additionally, a higher incidence of non-right handedness has been described in preterm born children. Yet, our knowledge is still limited in how a preterm birth may affect brain maturation and how this is associated with later performance and motor functioning.

Methods: In the first phase of this on-going, longitudinal study, motor functions have been investigated in 7–9-years-old children born preterm without early sign of neuropathology (*N*=32, Mean GW=32) in comparison to age matched fullterm born children (*N*=38). Kinematic registrations during task specific upper-limb movements as well as side differences were assessed. Additionally, functional brain structures/volumes were investigated by 3-Tesla (T) magnetic resonance imaging (MRI).

Results: Preliminary outcomes indicating subtle, but still poorer uppe-limb performance generated from the kinematic outcome parameters and with less clear side preferences in the preterm-born children. Decreased total brain

volume and regional gray matter reduction were associated with more segmented movement trajectories and with gestational age and birthweight. These results suggest that neuromotor functions are less efficient and less lateralized as an effect of a preterm birth.
Conclusions: The findings underscore the need for follow-up programs and more refine neuromotor investigations to improve early identification of developmental delays and therapeutic efforts to optimize motor development in preterm born children.

OP-15.1
Long-term functional outcome of brachial plexus birth palsy

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Objective: To study the long term outcome of brachial plexus birth palsy (BPBP), with emphasis on function.
Background: BPBP is diagnosed in 0.4–4.6 newborns per 1000 liveborns. While most children recover, a significant proportion gets permanent sequelae.
Methods: In this hospital based cohort study, all 91 children born 1991–2000 with a diagnosis of BPBP were invited to participate, and 69 (75.8%) met for a detailed examination at a mean age of 15 years (age range 10–20y). Participants were evaluated by Modified Mallet classification (MM), range of motion, shoulder- and grip strength and Assisting Hand Assessment (AHA). Daily activities (ADL) were evaluated using the Canadian Occupational Performance Measure (COPM). Sequelae was defined by a MM<20.
Results: Seventeen participants had permanent sequelae, corresponding to 0.6 cases per 1000 births. The sequelae group had limited active external rotation of the affected shoulder (≤15°), and a significant difference in median passive external rotation between affected (30°) and non-affected (70°) shoulder (p<0.001). In addition internal and external shoulder rotation strength and grip strength were significantly reduced in the affected arm (p-values≤0.002). AHA scores were, in all 17 subjects, diminished to median 95% (27–97%), while one had major, and 14 minor ADL-difficulties. The non-sequelae group had normal scores on all examinations.
Conclusions: In this study, almost every fifth newborn with BPBP had permanent disability. However, by using compensating movements they were independent in most daily activities, although activities demanding specific positioning or movement of the arm were difficult.

OP-16.1
Robotic-assisted locomotion training in children affected by cerebral palsy

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Objective: Our purpose was to evaluate if robotic-assisted gait training (RAGT) in children with Cerebral Palsy (CP) could improve gross motor abilities and gait. There is increasing evidence that intensive functional training is effective in improving the motor abilities of children with CP. Based on the motor learning concept, RAGT offers a specific gait rehabilitation by a greater amount of stepping practice increasing speed and longer walking distance during therapy sessions.
Methods: Thirty-two ambulatory children with Bilateral Spastic CP were assigned to three 10-week training groups. Nine children had 20 sessions of RAGT and 20 sessions of TOP (RAGT+TOP), 13 children had 40 sessions only of RAGT and 10 children had 40 sessions only of TOP. The Gross Motor Function Measure, 6-minute Walk Test and 3D Gait Analysis (Gait Gillette Index) were assessed prior to, at the end of, and 3 months after the end of the treatment.
Results: After the training and during the follow up, all the groups showed significant improvement in GMFM (p<0.05), in particular in the dimensions D and E. Children of RAGT and RAGT+TOP group increased their walked distance more than children of TOP group. After the treatment, GGI derived from 3DGA was unchanged for RAGT+TOP and RAGT group, whereas children of TOP group showed a worsening in gait pattern.
Conclusions: Our data suggested that RAGT is safe, feasible to implement and well-accepted by children. RAGT seemed to be generally as effective as intensive traditional physiotherapy, with additional slightly positive effect on gait endurance and maintenance of gait pattern.

OP-17.2
The weight status of children with disability and the factors effecting their physical features

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Objective: The purpose of this study is to evaluate the factors affecting their weight status and investigate their body mass index, hip and waist circumferences.

Methods: This study included the children with disabilities from four different areas (Bağcılar, Avcılar, Üsküdar, Küçük Bakkalköy) of Istanbul. They were evaluated according to their socio-demographic status and physical features including body mass index, waist- hip circumferences. The study included totally 268 children (8.48±4.76y, Girls/Boys: 110 /158) with disability. They were evaluated according to their diagnosis and divided into four subgroups as Cerebral Palsy (CP) (n=120, 44.8%), autism (n=93, 34.7%), Mental disability (MD) (n=12, 4. 5%) and other neurodevelepmental problems (muscular dystrophie, spina bifida, hemiparasis, paraplegia, norrie syndrome and microcephaly) (n=43, 16%). Gross Motor Function Classification System (GMFCS) was also applied to determine their physical function level.

Results: The mean value of the waist circumference measures for CP group were 57.77±11.93cm, 68.61±15.39 cm for autism group, 63.62±11.94cm for MD group, 60.86±14.80cm for other group. The mean body mass index was higher in mental disability group than other three groups (p<0.05). Age and the diagnosis of the children were found as statistically significant independent factors for the body mass index of the whole group (p=0.00, p=0.00).

Conclusions: Our data indicate that waist circumferences values were higher among the children with disabilities especially having MD. It was also observed that increasing age seems to be an important factor for having higher level of body mass index in the study group.

OP-17.3
Family-centred services and parental quality of life

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Objective: To describe parents' perceptions of family-centred services in a paediatric care, and explore the relationship between parents' experience of quality of life (QoL) and service provision.

Background: A family centred approach to services is widely accepted as a way of empowering parents and optimising child development. The influence of how services are provided on parent's QoL is scarcely assessed.

Methods: A survey among parents of children provided with services from a paediatric rehabilitation unit (n=194), including The Measure of processes of Care (MPOC-20), the Quality of Life Scale (QOLS) and data about child and family characteristics.

Results: As in previous studies, parents rated 'respectful and supportive care' highest (median 5.6, range 1.6–7.0) and 'providing general information' lowest (median 4.0, range 1.0–7.0). Fathers rated 'providing specific information about the child' (p=0.02), 'respectful and supportive care' (p=0.02) and 'co-ordinated and comprehensive care' (p=0.02) significantly lower than mothers. Parents having a child with multiple impairments (>7) rated all five MPOC domains significantly lower than those having children with somewhat fewer problems in functioning (p=<0.01–0.01). The parents' global QoL was in correspondence with a Norwegian reference population. Having a child with multiple impairments was associated with lower QoL (<0.01). No relationship was found between the experiences of service provision and QoL.

Conclusions: The results indicate that the complexity of the child's disability has to be taken into consideration to advance family-centred services that incorporate the whole family and not only the child.

OP-17.4
An international comparison of patterns of participation in leisure activities for children with and without disabilities

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Objective: To investigate whether there are differences of participation in leisure activities of children with and without disabilities between Sweden, Norway and the Netherlands.

Background: Participation is essential for health and well-being. Children with disabilities meet restrictions in their participation due to personal and environmental factors. Identifying factors promoting leisure participation, and to analyze the presumed causes of geographical heterogeneity between children in different countries is needed.

Methods: In a cross–sectional analytic design the Children's Assessment of Participation and Enjoyment, CAPE, was performed with 278 children with disabilities and 602 children without disabilities aged 6–17 years from Sweden, Norway and the Netherlands. The overall percentage of activities done never/seldom, regular and often of five activity types was calculated for each participant. A one way between-groups ANOVA was conducted to explore if there were differences between the countries. Hierarchical multiple regression analysis was used to assess the ability of age and gender, educational level, living areas and country of residence to predict participation.

Results: Scandinavian children with disabilities participated in more activities and with higher frequency compared to Dutch children. Country of residence was the strongest predictor. There were minor differences between the countries for children without disabilities, and the strongest predictor of variance was gender.

Conclusions: Different factors predicted the variance of participation in children with and without disabilities. As the Scandinavian children with disabilities had the highest level of participation in leisure activities further analysis of the presumed differences between country characteristics is essential.

OP-17.5
Adults treated for infantile hydrocephalus: a very long term follow-up of clinical, social and cognitive outcome and quality of life

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Objective: A very long-term (mean 35y) population-based follow-up of the first generation of successfully shunt-treated children, including clinical, social and cognitive outcome and quality of life.

Methods: A population-based series of 61 shunt-treated children born in 1967–1978 participated in a follow-up study at school-age, 43 were then found to be normally gifted (IQ>70). Twenty-nine of them accepted to participate in this very long-term follow-up. A clinical assessment, a semi-structured interview focused on health, medical problems, shunt complications, employment and living conditions, and a questionnaire on QOL were completed by all. An assessment of cognitive function (WAIS-III) was performed in 25.

Results: The majority (26/29) were born at term. All but three had needed shunt revisions. Motor dysfunction (including cerebral palsy) was present in 12 (41%), 5 (17%) had epilepsy and nine (31%) visual impairments. Seventeen (58%) had finished upper secondary school, 18 (62%) worked full time and 19 (66%) were living with a partner. Most rated their QOL as normal. Lower scores for the dimensions vision, eating, usual activities and mental functions were mainly found among those with cerebral palsy or epilepsy associated with hydrocephalus. Eighteen (75%) of 24 fully tested had a normal full scale IQ (90–108, median 101), 3 (13%) had a result in the lower normal area (80–89) and three (13%) had an IQ above 109.

Conclusions: This group of normally gifted early shunt-treated adults performed very well cognitively, medically, socially and reported a good quality of life.

OP-17.6
Caudal regression syndrome

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Introduction: Caudal Regression Syndrome (CRS), also known as Caudal Dysplasia and Sacral Agenesis Syndrome, is a rare congenital malformation characterized by varying degrees of developmental failure early in gestation. It can

affect the lower extremities, the lumbar and coccygeal vertebrae, and corresponding segments of the spinal cord. To review the clinical and Magnetic Resonance Imaging (MRI) results of patients with CRS to better understand the condition and its concomitant anomalies.

Materials and Methods: Of 77 patients, 48 were diagnosed with congenital spinal deformities (scoliosis/kyphosis) and 29 were diagnosed with neuromuscular deformities. Seven (six female, one male) patients were diagnosed with CRS. Between the years 2006–2009 a retrospective study was conducted using the MRI results, radiological and clinical data of pediatric patients who came to our hospital with spinal problems related to congenital or neuromuscular conditions. Radiographs were reviewed to classify each patient by Renshaw type. The mean age was 81 (30–180) months.

Results: Seven (9%) patients were diagnosed with SA related to CRS. According to the Renshaw classification, three children were defined as type 4, two children were defined as type 2 and two child was defined as type 1. The following conditions were diagnosed: one ectopic anus, one cleft mouth, two urinary system anomalies, one cardiovascular anomaly, two Thoracic Insufficiency Syndrome, three displaced hips, one syndactily, four scoliosis, one amelia. Using MRI results the following were diagnosed: one diaphragm hernia, one chiari malformation, three multi-level hemivertebrae, three syringohidromyeli, two tethered cord, one diastometamyeli, three spina bfida (SB) and 1 sacral dermal sinus.

Conclusion: In this study 9% of the patients were diagnosed with CRS in combination with congenital and SB related spinal deformities. This indicates that the condition may not be as rare as most studies suggest. Our retrospective study allowed us to see the various concomitant conditions which often occur with CRS.

Poster Presentations

PP-01.2
Atypical presentation of multiple sclerosis; tremor

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Multiple sclerosis is a progressive degenerative disease of the CNS with a pattern of symptoms that depends on the type of disease and the site of lesions. Multipl sclerosis has a significant impact on the quality of life for most patients over many years. Fourteen years old boy was referred to the pediatric neurology department with intentional tremor in both of hands. Cranial magnetic resonance imaging revelaed peculiar bilateral, periventricular deep and subcortical white matter on cerebellum and mesencephalon T2 hyper intensity and T1 izointensity with contrast. No other focal lesion or altered signal was seen in the other parts of the brain. Cerebrospinal fluid studies showed that increased oligoclonal band levels. According to the criteria of McDonalds the patient was diagnosed multipl sclerosis. After diagnosed, the patient was treated by pulse methylprednisolone theraphy. Tremor of the patient was recovered in 5 days. We present a case with atypical clinical presentation of multipl sclerosis with the cranial MRI findings that involvement of cerebellum without basal ganglia.

PP-01.3
Celiac disease in children with idiopathic mental retardation

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Aim: Celiac disease (CD) affects up to 1% of the general population and children with CD are at risk of developing neurological complications. The aim of this study was to determine the CD prevalence in children with idiopathic mental retardation (IMR).
Patients and Methods: The study consisted of 212 consecutive children with IMR 122 male, 90 female mean age 9 years (aged 6–15y) and 230 age and sex matched healthy controls. Demographic and clinical data collected from each child included age, weight, height, gastrointestinal symptoms, and the presence of anemia or endocrine disorders. The diagnosis of IMR was made after the examinations for neurometabolic and heterodegenerative diseases of nervous system. Patients with previous suspicion of CD were excluded from the study. IgA anti-tissue transglutaminase (tTG) and serum IgA were performed in all children by ELISA. Upper gastrointestinal endoscopy and biopsy procedure were done to seropozitive children.
Results: Two patients in the study group and one patient in the control group were positive for IgA anti-tTG. One patient in the study group refused to have endoscopic examination. These three patients were lack of intestinal symptoms. The histopathologic findings confirmed CD in 1 patient in the study and 1 patient in the control group who underwent endoscopy and biopsy. Prevalence rates were 0.47 versus 0.43 (P>0.1) in CD patients and healthy controls respectively.
Conclusion: Our findings suggest that children with IMR might not exibit a higher CD prevalence rate.

PP-01.4
Coexistence of myositis, transverse myelitis, and Guillain Barré syndrome following mycoplasma pneumoniae infection

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Objective: Guillain-Barré syndrome and transvers myelitis may occur coexistently in the pediatric population. This may be explained by a shared epitope between peripheral and central nervous system myelin. Coexistent transverse myelitis, myositis and acute motor axonal neuropathy in childhood has not been previously described. We describe an adolescent patient with transverse myelitis, myositis and Guillain Barré syndrome following Mycoplasma pneumoniae infection.
Methods: A 14-year-old female patient was admitted with back pain, gradual weakness and walking disability. Ten days prior to the onset of her symptoms, she had upper respiratory tract infection. Based on the clinical findings, a presumptive diagnosis of myositis was made at an outside institution because of high serum creatine kinase level. The patient was referred to our institution for further investigation.
Results: Physical and neurological examinations revealed normal deep tendon reflexes. There were no pathological reflexes. Muscle strengths in proximal and distal muscles of upper and lower extremities were 3/5 and 4/5, respectively. Magnetic resonance imaging of spine revealed enhancing hyperintense lesions in anterior of cervicothoracic spinal cord, extending from C4 to T3 vertebral level. The electromyography findings were consistent with acute motor polyneuropathy. Serum Mycoplasma pneumoniae IgM and IgG were positive indicating an acute infection. Repeated Mycoplasma pneumoniae serology showed a

significant increase in Mycoplasma IgG titer. The patient was given intravenous immunglobulin for 2 days and clarithromycin for 2 weeks. She was discharged after starting to walk independently.
Conclusions: In summary, Mycoplasma Pneumoniae-associated musculoskeletal, central and peripheral nervous system involvement may occur coexistently in the pediatric population.

PP-01.7
Demyelinating changes of the brain in children with CMV infection

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Objective: To study the clinical, neuroradiological and laboratory features of persistent prenatal CMV-infection in children.
Methods: We studied nine children (six boys, three girls) aged from 2 to 3 years with CMV-infection. I group includes children with generalized forms of infection, II group – latent form.
Results: Manifest form of infection was observed in 1 (11%) child in neonatal period in the form of CMV-encephalitis with stroke. Focal defect led to formation of hemiparetic form of CP. Three children (33%) suffered generalized infection in the postnatal period. In the future, these children had a severe neurological pathology: symptomatic epilepsy, severe psychomotor retardation, dyskinetic form of CP. Five (56%) children had latent form prenatal CMV-infection. The clinical manifestation of disease in this group of children began since second year of life, had connection with a previous vaccination (2), severe acute viral and bacterial infections (2), intestinal infections (1) and manifested as seizures, progressive delay psychomotor and speech development, pathology of vision. Laboratory studies showed the absence of anti-CMV IgG in the presence of CMV DNA in I group and low titers of anti-CMV IgG in the presence of CMV DNA at the II group. MRI of the brain have been found large foci of white matter demyelination in cerebral hemispheres and cerebellum (4), small, diffusely distributed foci of demyelination in the periventricular area predominantly (5).
Conclusions: Prenatal CMV infection has latent course, tendency to prolonged circulation of virus in the body, causes the demyelinating changes, which leads to aggravation of neurologic status.

PP-01.8
The importance of late neuronal migration in the neonatal and following periods

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Objective: This work places the clinical importance of the late neuronal migration (LNM) during the neonatal period and in following periods of life. In the neonatal period, we have to make the following translation: (1) the LNM and the clinical examination according to Brazelton, Dubowitz and Prechtl in the preterm and term infant; (2) The LNM and the care of the sick neonate focused on the development. In the following periods, we have to make the following translation: (1) LNM and the primitive reflexes; (2) LNM and the anatomic findings in the brain.
Methods: We made a translation between this building of brain process and the items found in the clinical examination according the Dubowitz examination, in the Precthl's method analysis of general movements and in the neonatal assessment scale of Brazelton.
Results: The ultrastructural disposition of brain during LNM explains the spontaneous (from gravity) and responsive motor states (succion, light, noise, smell) of the newborn. It represents the major intrinsic mechanism: (1) Slowly and progressively, to integrate the stimuli coming-from environment; (2) Acutely and with habituation to reduce the stress and preserve the sleeping periods; (3) Constantly, to maintain a maximum of energy for basal metabolism and growth, reducing the moments inducing the expense of energy.
Conclusions: The LNM described by Sarnat has an important role in the normal and sick neonates and infant. In case of insufficiency of this intrinsic mechanism or extrinsic offered mechanism du to sickness, the LNM is partially responsible for later findings in the previously sick newborns infants.

PP-02.2
Cognitive correlates of ADHD symptoms in preschool children

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Objective: To examine the association between attention deficit hyperactivity disorder (ADHD) and cognitive skills among preschool children.

Methods: We conducted a cross-sectional study among a representative nationwide sample of preschool children. ADHD was assessed though a structured diagnostic interview based on DSM-III-R criteria to both primary caretakers and teachers. Cognitive skills were assessed though a standardized school readiness screening test (A' Test). We used the Mantel-Haenszel method to compare the cognitive skills of preschoolers with and without ADHD.
Results: Among the study population (n=4480) the occurrence of ADHD approximated 4.6% (n=205). These were significantly more likely to present abnormal scores for critical reasoning skills (OR=5.51; 95% CI: 3.41–8.90), organizational skills (OR=3.67; 95% CI: 2.54–5.29), visual motor skills (OR=3.33; 95% CI: 2.39–4.63), visual perception skills (OR=3.22; 95% CI: 1.83–5.66), language skills (OR=2.68; 95% CI: 1.76–4.10), and abstract thinking skills (OR=2.50; 95% CI: 1.64–3.83).
Conclusions: Preschool children with ADHD run into a notable high risk of compromised cognitive skills. Timely testing and early interventions may optimize the above difficulties and enhance school performance.

PP-03.9
Turkish adaptation of the sensory profile

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Objective: Sensory profile (SP) is a questionnaire designed for use by caregivers to evaluate the way in which a child responds to various sensory stimuli and to identify the sensory system(s) responsible for causing difficulties in performing daily activities. The purpose of this study was to develop the Turkish version of the SP and to examine its psychometric properties in the assessment of children with autism.
Methods: The translation of the SP into Turkish was initiated at the Department of Occupational Therapy (OT), Hacettepe University and was carried out in several phases. A multi-step process, based on back-translation and the bilingual method was undertaken to examine whether the Turkish translation was linguistically equivalentto the original SP. A total of 144 caregivers of children with autism completed the final version of the SP at Hacettepe University, Faculty of Health Sciences, Unit of Occupational Therapy and 2 different special education and rehabilitation center. Eighty-two caregivers filled the questionnaire twice after an interval of 7 days.
Results: The SP's translation was realized with minimal difficulties. The forward and backward translations had some discrepancies reflecting language specific/cultural differences in some items. The Turkish version of the SP met set criteria of test-retest reliability and internal consistency (p<0.05).
Conclusions: There were not any validated instrument to assess sensory integration problems of children with autism. Turkish version of SP was found as reliable and valid means to measure the sensory processing and modulation problems of children with autism. Therefore, it is highly recommended to use in Turkish population.

PP-04.1
Effects of Snoezelen room in children with learning disability

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Objective: To examine the sensory integrative intervention, vestibular stimulation and neurodevelopmental therapy approaches are effective treatment methods in separate or combined programs in the treatment of mentally retarded children.
Methods: In three treatment groups, we compared the effects of the Sensory Integrative Therapy, Vestibular Stimulation within Sensory Integrative Therapy and Neurodevelopmental Therapy on sensory integrative functions, gross motor and fine motor skills and finally independent in daily living activities. Each treatment groups consisted of fifteen Ds children. The first group received Sensory Integrative Therapy, the second treatment group received Vestibular Stimulation and Sensory Integrative Therapy and the third treatment group received Neurodevelopmental Therapy. Efficacy of treatment methods was assessed with Southern California Sensory Integration, Vestibular Function, Locomotor Skill, Manipulative Dexterity of hands and Protective Extension and Equlibrium Tests.
Results: Our results indicated that after the treatment sessions significant gains were obtained in the sensory integrative functions and fine hand skills of the first treatment group (p<0.05) while no significant gains in vestibular system, balance, locomotor skills and reflex development (p>0.05). In the second treatment group, significant gains were found in all of the skills except locomotor skill-side test (p<0.05). In the third treatment group, significant progress was obtained in the whole skills which were tested

(p<0.05). When these groups were compared statistically significant differences were seen in The Balance on Right Foot-Eyes Open, Pivot Prone Position-Quality Score and Locomotor Skill-Front Tests (p<0.05).
Conclusions: The results of our findings revealed that all the approaches can be used together or according to child's needs.

PP-05.1
Bimanual skills and the corpus callosum – a study of brain behavior relationships in children with hemiplegia

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Objective: Investigation of relationships between hand function, cerebral motor activation and white matter (WM) integrity of the Corpus Callosum (CC) in children with hemiplegia (CH) using structural and functional Magnetic Resonance Imaging (MRI).
Background: Correlations have been shown between conventional MRI and neurological outcomes in CH, however little is known of the microstructure of the CC in relation to bimanual skills in children with hemiplegia.
Methods: Seventeen children with hemiplegia (mean age 10.6+3.4) underwent MRI imaging alongside functional motor assessments. Imaging included: Diffusion tensor imaging (DTI) and a functional MRI hand clenching/grasping task. The CC was segmented to genu, midbody and splenium. Mean values of fractional anisotropy (FA), mean diffusivity (MD), axial diffusivity (Da) and radial diffusivity (Dr) were calculated. Children also underwent a motor evaluation including the Assisting Hand Assessment (AHA).
Results: Significant correlations were evident between the AHA and the Da, MD and Dr of the midbody of the CC (r=-0.8; r=-0.7; r=-0.6; all p<0.05). Higher numbers of active voxels in the ipsi-lesional hemisphere when moving the affected hand correlated positively with AHA (r=0.6; p<0.05) scores. Further results will be reported.
Discussion: A strong relationship between the WM integrity of the CC and motor function was shown. The importance of these results with respect to understanding brain-behaviour relationships across unimanual and bimanual skills, as well as their influence on outcomes and treatment planning, will be explored.

PP-05.2
Motor development in children with MPS I (Hurler syndrome) after stem cell transplantation

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Objective: The purpose of this study is to gain more insight into longterm motor development after stem cell transplantation (SCT) in children with Hurler syndrome (MPS I).
Methods: Ten children are enrolled in the study. Inclusion criteria: at least two follow-up moments, a successful SCT (between 1999 and 2010), MPS I. The average age at the time of SCT was 18 months (range 8–29mo) (SD 8). Tests were used according to the age and cognitive level of the child. To asses motor development we used the BSID-III (n=6) and the Movement ABC-II (n=4).
Results: Follow-up with BSID III: 11 months after SCT (chronological mean age 26mo) mean developmental: fine motor function: 18 months – gross motor function: 17 months. Twenty-two months after SCT (chronological mean age 37mo) mean developmental age: fine motor function: 26 months – gross motor function: 20 months. Thirty-four months after SCT (chronological mean age 49mo) mean developmental age: fine motor function: 31 months – gross motor function: 27 months. Follow-up with the MOV-ABC II: 53 months after SCT (chronological mean age 74 mo) mean scale score: hand function 5, ball function 7, balance 5 and a total scale score 4. 68 months after SCT (chronological mean age 91mo) mean scale score: hand function 4, ball function 6, balance 3 and a total score of 3.
Conclusions: After SCT children with MPS I show a grow in motor function at least for the first 7 years but a delayed motor development compared to healthy children.

PP-05.3
Investigation of normal development of high risk infants under 12 months

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Objective: Preterm infants are at high risk of developing deficits during childhood. Deficits have been reported among preterm children without neurosensory impairments. This study aimed to assess high risk infants with who were born ≤32 weeks and ≤1500g with Neuro Sensory Motor Development Assessment (NSMDA) and Bayley Scale of Infant and Toddler Development 3rd-Version (Bayley-III).
Methods: One hundred and sixty high risk infants referred to our unit for early rehabilitation by neonatologist were included. To assess motor development the Motor Scale of Bayley-III and NSMDA, cognitive and language development were assessed Language and Cognitive scale of Bayley-III were used by pediatric physiotherapist. The correlation between NSMDA and Bayley-III were assessed using Spearman Correlation Analysis.
Results: Mean gestational age was 29.4±2.1 weeks and mean birthweight was 1195.7±255.3g. Median scores of NSMDA and Bayley-III were in normal ranges in 1, 4, 8 and 12 months of infants. Correlation of Bayley-III motor and NSMDA were 'very strong' in 1st, 4th, 8th and 12th months (respectively; r=-0.793, -0.791, -0.930, -0.883, p<0.001). Bayley-III cognitive and NSMDA scores were 'very strong' correlated in 1st, 4th, 8th and 12th months (respectively; r=-0.762, -0.772, -0.759,-0.766, p<0.001). Bayley-III language and NSMDA scores were 'strong' correlated in 1st, 'very strong' in 4th, 8th and 12th months (respectively; r=-0.739, -0.781, -0.862, -0.807, p<0.001).
Conclusions: NSMDA and Bayley-III are useful and effective methods on evaluation of high risk infants under 12 months old. Also, the motor, cognitive and language development are related to each other and indivisible whole of infants development.

PP-06.1
Correlation of the Visual Gait Assessment Scale, Edinburgh Visual Gait Scale and Observational Gait Scale in children with spastic diplegic cerebral palsy

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Objective: To correlate Edinburgh Visual Gait Scale (EVGS), Visual Gait Assessment Scale (VGAS) and the Observational Gait Scale (OGS).
Methods: Transversal study with 8 children with diplegic spastic CP, at level 1 or 2 of Gross Motor Function Classification System (GMFCS), of gait analysis by EVGS, VGAS and OGS, evaluated by 3 examiners. This study was approved by the Research Ethics Committee of the Universidade Estadual de Campinas. The kappa scores were used for data analysis, and a 5% significance level was considered.
Results: The Intra-observer study showed that agreement among the methods for classification children was moderate to excellent (k=0.41, 1.00), the comparison between VGAS and the EVGS showed the better agreement level, and EOM showed a discord in comparison with others scales. The intra-observer reliability showed to be predominantly high.
Conclusions: The results noticed that VGAS and EVGS are better for children's diplegic spastic CP gait assessment when comparate to OGS.

PP-06.2
Motor learning through video gaming in cerebral palsy

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Background: Cerebral palsy (CP) is a group of permanent disorders of the development of posture and movement, causing limitations in daily activities. One option in clinical intervention is the use of virtual games.
Objective: The objective of this study is to verify the occurrence of motor learning in a video game task in individuals with CP.
Design/Methods: Five children with the medical diagnosis of CP, two female and three male, participated in the intervention. Task execution consisted of playing a bowling game on a Nintendo Wii video game console. To verify the occurrence of motor learning, 20 attempts were held to throw the bowling ball a distance of 2m in the television in the acquisition stage; five attempts in the retention phase and five in the immediate transfer phase (which was held at a distance of 3m).
Results: The following are data of the phases evaluated through the mean of each phase: acquisition 1 (3.8), acquisition 2 (5.3), retention (4.2) and transfer (4.2).
Conclusion: In analyzing the results, regarding the performance in the acquisition phase, learning may be deduced because the participants had improved performance in the direction of a starting point to a point later in time (acqui-

sition 1 in relation to acquisition 2). Additionally, performance curves presented a negatively accelerated exponential pattern where a plateau of performance can clearly be identified with the passage of time.

PP-06.16
Activity performance problems of children with cerebral palsy

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Objective: Aim of our study was to determine the activity performance problems of children with cerebral palsy (CP).
Methods: The study was performed on 23 children with CP between the ages of 2–18 (7.56±5.67y). Canada Occupational Performance Measure (COPM) was used to assess Activity performance problems and satisfaction by asking to parents of children.
Results: According to COPM, mean performance score of children was found 2.15±1.76, mean performance satisfaction score was found 1.79±1.67. According to parents, 100% of children had functional mobility problems, 95.7% had personal care problems, 52.2% had socializing problems, 34.8% had community success problems, 26.1% had play problems, 4.3% had work problems, 4.3% had rest problems included in COPM. The most prioritized activity performance problems identified with the COPM by the parents were walking (95.65%), toileting (86.95%), feeding (56.52%) and communication (52.17%) activities.
Conclusions: According to our results the most seen problems in CP were walking, toileting, feding and communication. These results are similar to previous studies perfomed in disabled children in other countries. Further studies are needed to conduct with larger sample size to investigate the activity performance problems of children with CP so that self centered rehabilitation approaches by decreasing activity limitations and participation restriction will be able to icrease.

PP-06.20
Developmental disregard: an ERP approach

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Objective: Within Cerebral Palsy (CP) movement impairments are frequently lateralized and often a failure to use the motor capacities of the affected arm in spontaneous daily use is observed. Findings from the literature suggest that this non-use of a paretic arm is a learning phenomenon which is referred to as 'developmental disregard' (DD) in children.
Methods: In order to study the neural substrate involved in DD we recorded the Event-Related Potentials (ERP) from the ongoing EEG during a single- and dual task from a child with unilateral CP showing signs of DD and compared these with ERPs from a group of healthy controls.
Results: We observed that the child with DD showed an increased left-right difference in the dual task condition on the ERP P300 to the cue stimulus. This increased difference was not observed in the control group. In addition, when a response had to be inhibited, the ERP elicited by the NoGo signal showed a large left-right difference in the child with DD which was not visible in the control group.
Conclusions: In summary, during tasks with an increased mental effort the child with DD showed larger discrepancies in ERPs for the affected than non-affected hand. Because no direct response was asked on these stimuli, already information processing preceding response initiation of the affected side seems to be altered in children showing DD. We propose that ERP research might increase our understanding of the phenomenon of DD and might be useful for differential diagnostics leading to more refined and individualized rehabilitation.

PP-06.22
Effects of selective dorsal rhizotomy timing on functional capacity in patients with cerebral palsy

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Objective: Spasticity in growing child with Cerebral Palsy (CP) is particularly deleterious, given the critical period of muscle and bone growth and motor development that eventuate during this period. Selective Dorsal Rhizotomy (SDR) is well-established and highly effective surgical treatment for reduction of lower extremity spasticity in CP cases. The purpose of this study is to evaluate the effects of SDR timing on functional capasity in patients with CP.
Methods: We evaluate 41 CP related spastic diplegia cases who underwent SDR operation between 2003 and 2006 in Acibadem University, School of Medicine, Kozyatağı Hospital. Twenty five cases were under 6 years of age (group 1), sixteen cases were over 7 years of age (group 2). Changes were evaluated with developmental functional capasity measure. These parameters were: head balance control, volution, creeping, sitting independently, standing on knees, walking with help, walking independently. Development of functional capasity before and after SDR

were evaluated in both groups. Percentage frequency method was used for statistical examination.
Results: We established significant improvements in both groups after SDR. The group 1 demonstrated greater improvement than the group 2.
Conclusions: Early treatment with SDR increases functional capacity in children with CP. Our experience suggests that in carefully selected cases, SDR can be an effective treatment tool in CP cases under 6 years of age.

PP-06.28
Quality of life and participation in children and adolescents with cerebral palsy in Spain

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Objective: This study examined the association between participation and the quality of life among children and adolescents with Cerebral palsy (CP) who live in Spain.
Methods: Eighty-seven Spanish children and adolescents (42 males and 45 females) with CP (mean age 12.4y, range 8–18y [SD 3y 9mo]) and their parents participated in this cross-sectional study. The children and adolescents completed the Children's Assessment of Participation and Enjoyment (CAPE) and their parents completed the KIDSCREEN-parent version. The distribution according to GMFCS was 19.5% Level I, 12.6% Level II, 18.4% Level III, 13.8% level IV, and 33.3% Level V. Multiple linear regression was used to estimate the effect of participation on the quality of life, independent of age, gender and level of impairment.
Results: The children and adolescents with CP had low scores on diversity and intensity of participation and low results on almost all the domains of quality of life. Independent of GMFCS, age and gender the diversity and intensity of participation were significantly associated with quality of life in four out of the 10 domains (Physical well-being, Social support and peers, Mood and emotions & Self perception). The diversity of participation explained 35% of the variance in domain Physical well-being and 26% in Social support and peers, while the intensity of participation explained 37% and 27%, respectively, in these same domains.
Conclusions: The level of diversity and intensity of participation has a limited effect on the quality of life of Spanish children with CP aged between 8 and 18 years.

PP-06.31
Evaluation of the cerebral palsy follow-up program in Norway – what do the parents and health professionals think?

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Objective: To evaluate the Cerebral Palsy Follow-up Program (CPOP) in Norway. CPOP was implemented in South-Eastern Norway (SEN) in 2006 and nationally in 2010. All children with CP born from 01.01.2002 in SEN and from 01.01.2006 in the other regions are assessed regularly according to a standardised protocol.
Methods: Cross-sectional, population based survey including all the parents and health professionals involved in the CPOP in SEN. A postal questionnaire with ten items with a 4-graded Likert scale was used. The last two questions were different for parents and health professionals.
Results: Totally 223 of 297 parents responded (75%), 61% mothers, 10% fathers, 25% both parents, and 4% other caregivers. In addition 137 health professionals responded, 68% physiotherapists, 23% occupational therapists, 7% paediatricians and 2% leaders, 64% worked in primary health care and 36% in ten habilitation units. The most frequently reported challenge was coordination of the services, both across professional as well as administrative borders. The scorings are presented in Table1.
Conclusions: Both parents and health professionals think that CPOP makes the follow-up of children with CP more predictable, more equally distributed, giving more optimal timing of interventions. Information to newcomers should be stressed, and the assessments should be used as sessions of dialogue and exchange of knowledge. Differentiation of assessment frequency for different subtypes of CP has been implemented along with increased knowledge. The success of CPOP calls for systematic follow-up programs in other areas, such as nutrition, communication and cognition, and for other diagnostic groups with life span disabilities.

PP-06.32
Treatment of drooling in patients affected by cerebral palsy

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Objective: Drooling, due to a poor control of oropharingeal muscles is frequent in patients affected by cerebral palsy. This can cause discomfort of patients and skin problems. The aim of this study is to systematically review evidence on treatment of drooling and possible side effects in

patients affected by cerebral palsy after injection of botulinum toxin in the salivary glands.
Methods: We evaluated 34 patients affected by cerebral palsy- spastic quadriplegia- (mean age 11.4y) by mean of a scale assessing frequency and severity of the problem. We treated the patients with the help of an ultrasound guidance, injecting botulinum toxin in parotids and submandibular glands. The dosage was 5–75U of Botox e 10–145U of Dysport per parotid; 5–30U of Botox e >80U of Dysport per submandibular gland. We repeated the evaluation 15 days, one and 3 months after the treatment.
Results: All treated patients reduced the drooling after a mean period of 6.4 days with a maximum effect after 15 days. One patient presented dysphagia after the treatment: the symptom spontaneously regressed after 15 days. The mean duration of the therapeutical effects of botulinum toxin was 3 months. All patients requested a new treatment.
Conclusions: Treatment of drooling with botulinum toxin is confirmed to be a good and safe tool in children affected by cerebral palsy.

PP-06.34
Saliva problems and its effects on family: a retrospective study

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Objective: We aimed to demonstrate conditions about saliva problems, family influences and restriction of social life in cerebral palsied children.
Methods: Thirty-seven cerebral palsied children whose avearage age were 6.37±4.70 years have been evaluated. Saliva rating scale was used for evaluation of saliva severity and frequency. Its effect on family was graded with visual analog scale. We also noted the conditions which increased saliva flow, frequency of changing clothing and education level of parents.
Results: Saliva increased when head was down (78.9%), concentrated in something (57.9%), problems with teeth (47.4%), after eating or drinking (42.1%), taking something to mouth (42.1%), sleepless (36.1%). 70.3% of children had severe saliva problems and their family were affected negatively according to visual analo scale, mean level 7.60± 3.08 (min=0, max=10). There was a positive correlation between saliva severity, frequency and freuency of changing clothes (p<0.01) and between freuency of changing clothes and social restriction (p<0.05). And there was no correlation between education level and family influences (p>0.01).
Conclusions: Multi-factors trigger saliva problems and these affect social and functional partipication of cerebral palsied children and families. So pay attention to saliva problems in cerebral palsied children like gross and fine motor functions is very important.

PP-06.46
Comparison of intensive early physiotherapy versus routine physiotherapy in high risk infants

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Objective: Early developmental interventions to prevent the high rate of neurodevelopmental problems in high risk infants including cognitive and motor impairments, are required. The purpose of this study was to compare the effectiveness of intensive physiotherapy versus routine physiotherapy practice in high risk infants.
Methods: First group received early intensive NDT twice a week and second group received home programme, parent training as routine physiotherapy during 12 weeks. Motor (gross and fine), cognitive, language (receptive and expressive) development were assessed with the Bayley Scales of Infant and Toddler Development, Third Edition (Bayley-III). Chi-squared test was used to find the differences in categorical variables in between groups and independent t test used for numerical variables. Variance analysis was performed to analyse Bayley scores if there were differences in between groups and in each group by the time.
Results: Mean ages of high risk infants were 7.8±2.5, and 8.2±3.5 months in first, second group, respectively. Mean birthweight of infants were 2284.8±838.6 and 1686.4±739.5 grams in first, second group, respectively. There were no statistically differences in cognitive (p=0.432), fine motor (p=0.602), gross motor (p=0.587), receptive language (p=0.095), expressive language (p=0.76) scores between groups but motor, language and cognitive raw scores were increased significantly in both groups by the time after (p<0.001).
Conclusions: Although there were no significant differences in intensive and routine physiotherapy groups, scores of infants increased in each group at end of intervention.

Early intervention follow ups are required to support the development in high risk infants.

PP-06.47
Agreement of classification systems in children with spastic cerebral palsy

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Objective: Classification systems are important for health professionals to develop common language, follow up child and documentation of datas. The aim of this study was to investigate the agreement between classification systems-Gross Motor Function Classification System (GMFCS), Manual Ability Classification System (MACS) and Communication Function Classification System (CFCS) in children with spastic CP.
Methods: One hundred and fifteen children with spastic CP were included study. The age of children was between 4 and 15 years of age. Each participant classified according to GMFCS, MACS and CFCS Turkish versions. All the statistical analyses were made using the SPSS software pack-age for Windows (ver. 15.0). Intraclass correlation coefficient was used to assess the agreement in between three classification systems. Spearman correlation coefficient was used to investigate the relation in between two classification systems.
Results: Thirty children had hemiparesis, 26 had diparesis and 59 had quadriparetics. The agreement in between GMFCS-MACS-CFCS was 0.642 (p<0.001) for all cases. Three classification system had agreement in only quadriparetic CP with a value of 0.467 (p<0.001) and had no agreement for diparetics and hemiparetics. For all spastic cases; correlation between GMFCS-MACS was 0.706 (p<0.001); GMFCS-CFCS was 0.657 (p<0.001) and MACS-CFCS was 0.635 (p<0.001).
Conclusions: The agreement in classification systems increases by the severity of the condition increases and differs according to involvement of CP. Use of three practical classification systems gives a whole easy knowledge in clinical practice as well as valuable datas in research field of CP.

PP-06.49
Clinically feasible screening method for functional visual impairment in children with cerebral palsy

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Objective: To develop a clinically feasible screening method for functional visual impairment of children with CP performed by trained nurses.
Methods: The awareness of cerebral visual impairment (CVI) or cerebral visual dysfunction (CVD) and its impact on daily life of a large number of children with CP has increased. Problems in functional vision may influence e.g. child's ability for orientation and moving, communication and social inclusion. In formal clinical assessments functional visual impairment may affect reliability, especially if the impairment remains undetected.
Design: This project is a part of a larger multiprofessional CP-project which started in 2008 in neuropediatric units of two University Hospitals (Turku and Helsinki). Nurses together with pediatric neurologists, ophthalmologist and special vision instructors designed a screening method based on simple tasks assessing especially dorsal and ventral stream functions. The screening tool was applied to two clinical patient cohorts at both University Hospitals (Jan to June 2009 and 2010).
Results: The composed screening method will be introduced. 76 children were screened by this method. 15 children had normal results in all tasks and 61 children showed one or more functional visual problems. The impairments were undetected before the screening in 29% of the children.
Conclusions: We have developed an easily applicable screening method for functional visual impairment of children with CP. The screening method can be performed by trained clinical nurses as a part of the multidisciplinary assessment.

PP-06.52
Parent's perceptions of family-centred practice for preschoolers with cerebral palsy in Norway

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Objective: To describe parent's perceptions of family-centeredness in primary health care and identify areas of improvement in services using the Measure of Processes of Care (MPOC-20).

Methods: Population-based survey among parents of preschoolers with cerebral palsy (CP) (n=360) and data on child characteristics from the Norwegian Cerebral palsy follow up program.
Results: As in previous studies, parents rated 'respectful and supportive care' highest (median 5.1, range 1.2–7.0) and 'providing general information' lowest (median 3.1, range 0–6.6). Need of improvement were identified for 18 of the 20 MPOC items, specifically in provision of written and oral information about the diagnosis and available services. Mothers with lower education (12y or less) rated 'providing specific information' higher than mothers with higher education (p=0.009). A significant difference was also found between GMFCS levels for 'providing general information' (p=0.05), whereas no differences on any MPOC scale were found for other characteristics of the child and the parents. Parent's involvement in training and their experiences of benefits of services were not related to family-centeredness of care.
Conclusions: The results indicate several aspects of the services need to be improved to adhere family-centred practice for preschoolers with CP. Family-centeredness of care measured with MPOC-20 were not associated with parent-rated benefits of the provided services.

PP-06.53
Stimulus evaluation, event preparation and motor action planning in young patients with mild spastic cerebral palsy: an event-related brain potential study

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Objective: The study investigated stimulus evaluation time, event preparation and motor action planning of patients with mild spastic cerebral palsy and a peer control group.
Methods: Thirteen patients with cerebral palsy (five girls, eight boys; M=14y 6mo, SD=3y 6mo, min-max 9–18y) and fourteen control children and adolescents (seven girls, seven boys; M=14y 4mo, SD=2y 5mo, min-max 10–18y) participated to the study. Participants were carrying out a computerized Sternberg's stimulus recognition task, where a memory set was followed by a display set. Trials were positive (target present) and negative (target not present) and the participants were asked to give they response (yes or no) by pressing a response button. RTs, accuracy level and ERPs were measured.
Results: The patient group was slower and made more errors than the control group. Reaction times and the number of errors increased as a function of cognitive load in both groups. The P300 latency increased significantly with increasing load, but the P300 amplitude was insensitive for the cognitive load manipulation. The groups did not differ with respect to their P300 amplitudes. Groups did not either differ with respect to motor presetting reflected by contingent negative variation, or anticipatory action planning, reflected by P2.
Conclusions: The present findings suggest that when a simple overt motor response is required, patients with mild spastic cerebral palsy are slower but able to evaluate stimuli adequately.

PP-06.56
What is the importance of demodex folliculorum in children with cerebral palsy?

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Objective: Demodex folliculorum (DF) is an obligate parasite and commonly detected in patients with immune system dysfunction. In the human body, it is often settled around hair follicles and sebaceous glands on forehead, cheeks and nose. With aging the prevalence of Demodex is increased due to sebum production. In children with cerebral palsy (CP), the chronic malnutrition is encountered at a high rate due to chewing and swallowing disorders, spasticity and feeding difficulties. In this study, our aim is to investigate the incidence of DF in children with CP.
Methods: This study included 60 CP patient and 50 healthy children and performed between 1 August 2011 and 28 January 2012. Five samples of standardized skin surface biopsies (SSSB) were taken from each subject from the forehead, cheeks, jaw and nose. Infestation was defined as ≥5 living parasites/cm2 of skin.
Results: The 60 children with CP cases comprised 35 males (58.3%) and 25 female (41.7%). Mean age of children with CP was 6.5±4.38 years (range 1–16y). Meanwhile mean age of control group was 6.21±3.76 years (range 1–15). DF was detected at cheeks in 9 of 60 (15%) CP children. DF could not be detected in any children in the control group. Statistically significant differences in the incidence of DF

was found between children with CP and controls (p<0.05).

Conclusions: Our study shows that the suppression of the immune system due to malnutrition in children with CP is associated with an increased incidence of Demodex.

PP-06.58
The Dyskinesia Impairment Scale: a new instrument to measure dystonia and choreoathetosis in dyskinetic cerebral palsy

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Objective: Over the last few years, there has been continuing development of interventions in children with dyskinetic CP. However, objective evidence supporting these interventions is only preliminary. This can be understood in view of the lack of a sensitive measurement for dystonia and choreoathetosis in dyskinetic CP. Therefore we developed a new clinical tool: the Dyskinesia Impairment Scale (DIS). The objective of this study is to evaluate reliability and validity of the Dyskinesia Impairment Scale (DIS). The DIS is subdivided in two subscales and evaluates respectively dystonia and choreoathetosis in twelve body regions.

Methods: Twenty-five participants with dyskinetic CP (mean age 13y6mo; SD 5y4mo; range 5–22y) were included. Interrater reliability for the DIS was verified by two independent raters. For interrater reliability, intraclass correlation coefficients (ICC) were assessed. Standard error of measurement (SEM) and minimal detectable difference (MDD) and Cronbach's alpha for internal consistency were determined. For concurrent validity of the DIS dystonia subscale, the Barry-Albright Dystonia Scale (BADS) was administered.

Results: ICC for the total DIS score and the two subscales ranged between 0.91 and 0.98 for interrater reliability. SEM and MDD values were adequate. Cronbach's alpha values ranged from 0.86 to 0.93. Pearson's correlation between the dystonia subscale and BADS was 0.84 (p<0.001).

Conclusions: Good to excellent reliability and validity was found for the DIS and measures dystonia and choreoathetosis in a reliable way. The DIS may be promising to increase insights in the natural history of dyskinetic CP and in evaluating interventions. Future research towards responsiveness of the DIS is warranted.

PP-06.59
Comparison of the effects of constraint-induced movement therapy and neurodevelopmental therapy on using the upper extremity in children with hemiparesis

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Objective: The aim of our study is to compare the effects of Constraint-Induced Movement Therapy (CIMT) and Neurodevelopmental Therapy (NDT) on upper extremity in hemiparetic type of CP.

Methods: Thirty cases attended in our study. They were diagnosed from Istanbul Medicine Faculty Division of Child Neurology. They age range is 4–12 years and were divided into two groups randomly. One of them are CIMT and other NDT. Both groups entered to the clinic by 3 days in a week for 3 weeks and were applied therapy 2 hours in a day. CIMT group used a restrictive splint for 6 hours during the day additional in their therapy. Upper Extremity Skill Quality Test, Jebsen Taylor Hand Function Test, Pediatric Functional Independency Measure and Caregiver Functional Use Survey were assessed. These tests were applied before and after 3 weeks therapy.

Results: There were significant improvements in 'quality of use', 'speed of use', 'independency at activities of daily living' and 'usage frequency in daily activities' in both groups at the end of the study (p<0.05). Although it is seen that there were tendency to be better in some fiels of CIMT, there were no statistically significant differences in the comparison of the groups (p>0.05).

Conclusions: It was concluded that CIMT and NDT both were improved upper extremity function when they applied intensively.

PP-06.60
Rehabilitation planning for children and adolescents with cerebral palsy

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Objective: The objective was to gain understanding of the procedure when multidisciplinary team members plan rehabilitation for children and adolescents with cerebral palsy.

Background: Planning rehabilitation is the basis for service delivery in the care of children and adolescents with cerebral palsy. Rehabilitation planning is often conducted by a multidisciplinary team together with the child and his/her parents. Goal setting and the importance of children's participation in the immediate environment during development and all the transition phases are considered as the core of any rehabilitation practice.
Methods: Influenced by the theories of Family-centered service, goal-setting and International Classification of Functioning, Disability and Health-CY, thematic focus group interviews were conducted in five neuropediatric multidisciplinary teams. The interviews were type recorded and transcribed. Qualitative content analysis was used to analyze the transcription. Ethical approval was obtained by the Ethical Committee of the Social Insurance Institution.
Results: Members of neuropediatric multidisciplinary teams in five university hospitals, altogether 38 informants in five focus groups representing nine different professionals took part in the study. Goal-setting was experienced as difficult or challenging. Goals were mostly set by the different professionals solely and brought as information to the team meeting. Parent's involvement in the planning process was unsystematic. Transition to day-care was clear; other transition-phases were unsystematic. ICF was not in use.
Conclusions: The rehabilitation planning procedure could benefit from a clear structure. The ICF-CY can serve as a structure for information gathering. A goal setting instrument could facilitate goal setting for therapist and the family.

PP-06.61
The effects of goal-directed therapy on gross motor function in children with cerebral palsy

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Objective: To investigate gross motor function level and goal attainment in children with cerebral palsy (CP) before and after goal-directed therapy (GDT) and explore relationships. Focus for therapy is on learning new skills in the context of daily life. These specific skills can best be expressed by the child and the family through the formulation of goals for therapy. Thus GDT offers individually tailored activities that should challenge the child's learning potential.
Methods: Prospective longitudinal intervention study. Twenty six children with spastic CP, 5–17 years (mean: 9.42±3.61y), classified in GMFCS level I–V participated. 11 of 26 children were in level I, 1 of them was level II, 4 of them were level III, 2 of them were level IV, 8 of them were level V. Outcome measures were Gross Motor Function Measure (GMFM-88) and Goal Attainment Scale (GAS). Baseline, the GDT intervention was applied during 12 weeks each statistics analyses were performed using the SPSS (ver. 15.0). Wilcoxon test was used for within-group comparison of the GMFM-88 and GAS.
Results: Improvements were statistically significant demonstrated in GMFM-88 after the intervention in all participants ($p<0.001$). No significant difference between the extents of improvement was observed between the levels of GMFCS. Goal attainment to the expected level or higher was achieved improved after the 12 weeks GDT therapy ($p<0.001$).
Conclusions: Gross motor function improved after GDT. The goals were reached to a high extent, and the children gradually progressed towards their goals after the end of the intervention.

PP-06.63
Comparision of deformities of fingers via Zancoli and House classification with children with cerebral palsy

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Objective: The aim of the study is to investigate the deformities of finger and thumb of children with Cerebral Palsy (CP) via various classifications, and to analyze the relationship between the two classifications.
Methods: Children between 2 and 17 age, 10 unilateral CP, 71 bilateral CP; a total of 81 children was participated. Hand deformities were classified according to House Classification for Thumb (HTC) and fingers were classified with Zancoli Classification (ZC). Relationship between the two classification system and the patterns were analyzed with SPSS 17.
Results: Among the children with bilateral CP fingers were; 29.57% was pattern 2.2, 28.16% was pattern 2.1, 16.90% was pattern 3, 14.08% was pattern 1 and 1.12% was pattern 0 via ZC and the thumb's; 49.29% was pattern 3, 28.16% was pattern 2, 9.85% was pattern 4, 8.45% was pattern 1 and 4.22% was pattern 0 via HTC. The affected hand 's fingers with unilateral CP was % 40 pattern 1, 30% pattern 2.1, 20% pattern 2.2 and 10% was pattern 3 via ZC and thumb's 50% was pattern 1, 30% was pattern 2, 10% was pattern 3 and 10% was pattern 4 via HTC. In

our study, the relationship between the Zancoli and House Classifications was statistically significant. (p<0.05).
Conclusions: Thumb and finger deformities can be classified but the classification is not enough to understand the in child's functional level in daily living activities. More studies are needed to understand the relations between deformities, function and hand use. İt is thought age is an important component of hand use.

PP-06.65
Reliability and validity of Turkish version of Pediatric Outcome Data Collection Instrument (PODCI) for people with cerebral palsy

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Objective: Functional health and health related quality of life (HRQL) of the people with CP has been admitted as important factors contributing effective rehabilitation practices. Therefore, the present study was aimed to provide a Turkish version of PODCI which is one of the prevalently used HRQL scales in CP, to investigate reliability and validity of the scale for people with CP.
Methods: Age range between 2 and 18 years, 105 people with CP, 48 healthy people and their mothers were recruited for the study by separating three age groups, i.e. 2–7, 8–12, and 13–18. GMFCS levels, clinical types, demographical and socio-economical data of the cases with CP, PODCI scores and also PedsQL and CHQ PF-50 scores as a gold standard, of participants were recorded.
Results: Findings of the reliability of PODCI showed that the internal consistency was acceptable and test-retest reliability was quite high (α=.93, ICC=.992). Findings of the validity of the scale indicated that it was highly sensitive in separating children with CP from healthy children (p<0.001). However, the scale could differ age groups, clinical types and GMFCS groups only in the physical functioning domain (p<0.05) and affect only this domain of HRQL. The correlations among subscales of three scales illustrated that the convergent validity was established, while the divergent validity was not.
Conclusions: Turkish version of PODCI is reliable and valid for assessing functional health and HRQL of people with CP.

PP-06.69
Health related quality of life of adolescents with cerebral palsy: self versus parent perspectives

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Objective: Cognitive and communication problems of people with cerebral palsy lead to use parent reported health related quality of life measurements. The present study was aimed to determine whether there is a difference between perspectives of functioning and health-related quality of life (HRQL) of mothers and adolescents who have own autonomy with cerebral palsy (CP).
Methods: A total of 27 mother adolescent pairs age range between 8 and 18 years were recruited for the study. GMFCS levels and clinical types of the cases with CP, demographical and socio-economical data, PODCI and also PedsQL scores of both participants mother and adolescents were recorded.
Results: Between mother and adolescents subscale correlations and score differentiations of the PODCI and PedsQL were examined. Except expectation subscale of PODCI and emotional and social functioning subscales of PedsQL mother and adolescent scores correlated highly (E; r=0.320, EF; r=0.155, SF; r=0.282, p>0.05). for Both PODCI and PedsQL, mother and adolescent subscale scores differed only physical functioning domain (p<0.05). Findings showed adolescents saw themselves as less limited than mothers.
Conclusions: Whereas scales on most domains of HRQL agreed between mothers and adolescents, variances indicate assessing both parents and adolescents to determine goals of the rehabilitation. Adolescents do not consider themselves as limited by health conditions as mothers do; mothers have greater expectations for treatment regardless of functional and health status of their children

PP-06.78
Long-term effect of selective dorsal rhizotomy on gross motor function in ambulant children with spastic, bilateral cerebral palsy compared to reference curves

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Aim: To evaluate long-term effect of selective dorsal rhizotomy (SDR) on gross motor function in ambulant children with spastic, bilateral cerebral palsy (CP) compared to reference percentiles.

Method: Prospective cohort study examining 29 children (mean age: 6y and 3mo, SD 1y and 10mo at time of operation) classified in Gross Motor Function Classification System (GMFCS) level I, *n*=7; II, *n*=4; III, *n*=18 5 and 10 years after SDR. Selection criteria were based on previous studies. We used individual reference percentiles based on Gross Motor Function Measure (GMFM-66) scores and age corresponding to the GMFCS levels. Individual improvement was defined as a change of more than 20 percentiles. Side effects of and additional treatment after SDR was recorded.

Results: Five year after SDR 36% and 10 years after SDR 30% of the children improved. Spinal side effects (*n*=2) and hip subluxation (*n*=3) were noticed. Additional treatments were subtalar arthrodesis (*n*=13), tibia endorotational osteotomy (*n*=5) and botulinum toxin treatment (*n*=13).

Interpretation: This study showed that none of the children with CP in GMFCS level I, II and III deteriorated in gross motor function after SDR. For the long-term effect of SDR this treatment seems to be not harmful for the development of gross motor function. Even in comparison with reference percentiles one third of the children improved more on gross motor function 5 and 10 years after SDR than expected. Therefore our criteria for selection seem to be adequate. After the operation children still required additional treatments.

PP-07.1
Scholastic achievements in preterm born children

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Objective: To evaluate academic achievements at the age of 6–7 years in children born before 34 weeks gestation (WG) in 2003–2004 at the UZ Brussel.

Methods: Data were collected retrospectively for all neonates born before 34 WG between 1/2003 and 12/2004. The UZ Brussel follow-up program includes six evaluations by a pediatric neurologist and physiotherapist in the 2 years of life, as well as an assessment of psychomotor development at the age of 30 months and 5 years. For children who were lost to follow-up, parents were contacted for a structured telephone interview.

Results: Of all 228 patients born in 2003 and 2004, 31 were followed up to the age of 5 years. Fifty-two per cent of these children had no important school difficulties, 32% went to a school for special education, 10% had doubled a school year, 6% followed a remediation program.

Of the 189 children lost to follow-up, 116 could be reached for a telephone interview. Twenty-two per cent of children had significant difficulties at school. Of those children 35% went to a specialized school, 50% had doubled a school year and 15% followed a special remediation program.

Conclusions: Preterm born children are at increased risk for long-term neurodevelopmental problems.Twenty-two per cent of children lost to follow-up at the age of 5 have significant school difficulties. The importance of a regular follow-up of development at least up to the age of 5 years is recommended in order to identify children at risk for academic problems and facilitate early therapy and intervention.

PP-07.3
Language development in preschool children born after asymmetrical intrauterine growth retardation and impact of head growth

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Objective: The aim of this study was the assessment of language development and impact of postnatal head growth

in preschool children born at term, after asymmetrical intrauterine growth restriction (IUGR).

Methods: Examinees were born at term with birthweight below the 10th percentile for gestational age, parity and gender. Mean age at the time of study was 6 years, 4 months. The control group was matched according to chronological and gestational age, gender and maternal education, mean age 6 years, 5 months. Exclusion criteria were congenital infections, major malformations, central nervous system infections, chromosomopathies, severe asphyxia and the presence of recognisable genetic syndromes. There were 50 children in each group. For the assessment of language development Reynell Developmental Language Scale, the Naming test and Mottier test were performed.

Results: There were statistically significant differences ($p<0.05$) in language comprehension, total expressive language (vocabulary, structure, content), naming skills and nonwords repetition. Relative growth of the head in relation to weight gain was positively correlated to language outcome. Children with neonatal complications (60% of IUGR group) had lower results ($p<0.05$) in language comprehension and total expressive language. IUGR children with current head circumference below or on the 10th centile had poorer outcome in naming, language structure and articulation.

Conclusions: IUGR has a negative impact on language development evident in preschool years. Slow postnatal head growth is correlated with lower language outcome. Neonatal complications were negatively correlated with language comprehension and total expressive language.

PP-07.5
Do very-low-birthweight children without CP have more adaptation problems than controls?

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Objective: To compare skills of communication, daily living and socialisation as well as the total behaviour score in very-low-birthweight (VLBW) children without CP with a control group at 10 years of age. Adaptive behaviour is the behaviour necessary for an individual to function safely and appropriately in daily life, both at a personal and social level. The Vineland Adaptive Behavior Scales (VABS) has been used to describe an individual's adaptive behaviour as reported by caregivers.

Methods: In this follow-up study, 29 VLBW children without CP and 31 term born control children were evaluated by VABS at 10 years of age. Mean gestational age in the VLBW group was 26.7 (SD 1.9) weeks and mean birthweight 876 (SD 218) grams. Mean birthweight was 3588 (SD 345) grams in the term born control group. The informants were parents, mostly mothers. In VABS, adaptive behaviour is expressed as total score based on the three subscales: Communication, daily living skills and socialisation.

Results: The mean total adaptive behaviour composite score in the VLBW group was 90.6 (SD 14.5) compared with 105.5 (SD 17.5) in the control group ($p=0.001$). All three subscales; communication, daily living skills and socialisation were significantly lower in the VLBW group than in the control group.

Conclusions: The findings of this study indicate that VLBW children have more adaptation challenges than their peers born at term. These problems are not necessarily picked up in routine follow- up program, but may need specific attention to be revealed.

PP-07.6
What can children's drawing of a human figure say about fine motor development?

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Objective: Drawing is a unique and important activity that mediates creativity, innovation, evaluation and problem solving in childhood. In clinical practice drawing of a human figure has been used as a test to measure cognitive development, as it is quick and easy to administer. On the other hand, roles of fine motor and other sensory and cognitive functions in drawing skill are not known. Aim of this study is to investigate relative contribution of fine motor, sensory and cognitive functions in to children's drawing of a human figure while more focusing on fine motor development.

Methods: This study is part of a prospective and population-based longitudinal project (Stockholm Neonatal Project). One hundred eighty two preterm children (birthweight ≤1500 g and gestational age<37 wks) and 125 full-term children, matched for age and place of birth, participated in the assessment procedure (total 307). Drawing of a human figure will be analyzed and used as an outcome

variable, where motor free visual perception (Motor-free Visual Perception Test), intelligence (The Wechsler Preschool and Primary Scale of Intelligence-Revised), sensory functions (A Developmental Neuropsychological Assessment-NEPSY), motor functions (Movement-ABC) and visual motor integration (Developmental test of Visual Motor Integration) will be used as explanatory variables.
Results: Preliminary results of the study will be reported.

PP-07.8
Minor neurological dysfunction and cognition in 9-years-olds born at term

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Objective: In children with developmental disorders, motor problems often co-occur with learning problems. The associations between specific cognitive deficits underlying learning problems and Minor Neurological Dysfunction (MND) are still unknown. Therefore this study aims to assess associations between specific types of MND and performance in specific cognitive domains.
Methods: Three hundred and forty one 9-years-old children born at term (177 boys, 164 girls) were neurologically assessed according to Touwen. The Touwen assessment has been designed to evaluate MND. Eight types of MND are distinguished: mild dysfunction in posture and muslce tone, reflexes, coordination, fine manipulative ability, sensory function, cranial nerve function, choreiform dyskinesia and an excess of associated movements. Cognitive function in the domains of attention, memory and language was evaluated using the Test of Everyday Attention for Children (TEA-Ch), a developmental neuropsychological assessment (NEPSY) and the Children's Memory Scale.
Results: Fine manipulative disability and coordination problems were associated with lower scores on attention, memory and learning and language, other types of MND not. Girls with coordination problems performed significantly worse on attention/executive function than those without this dysfunction; however, in boys, such an association was absent.
Conclusions: In particular, fine manipulative disability and coordination problems were associated with cognitive impairment in the domains of attention, learning and memory and language. Previous and present data suggest a minor sex difference in neurocognitive associations: it may be that in girls dysfunction of the cerebello-thalamo-cortical pathways is associated with cognitive deficits, while in boys cognitive impairment may be associated with dysfunction of cortico-striato-thalamo-cortical pathways.

PP-07.10
Activity limitations and participation restrictions of people with cerebral palsy and intellectual disability

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Objective: To compare the activity limitations and participation restrictions of people with cerebral palsy (CP) and intellectual disability (ID).
Methods: 91 people (57 CP, 34 ID) were included study. The subjects and their parents' the demographic features were recorded. The Canadian Occupational Performance Measurement (COPM) was used to identify the activity limitations and participation problems of subjects. The COPM uses a semi-structured interview format to identify tasks which are important to participants and then to rate the performance and satisfaction of the tasks which are a priority. In the study, COPM was completed by parents of participants.
Results: The mean age of people with CP and ID was 11.86 ± 7.1 and 13.20 ± 6.8 years, respectively. With the exception of the fathers' education status, both groups were similar with respect to the demographic characteristics ($p>0.05$). The number of the associated problems of participants was significantly different between groups ($p<0.05$). There were no significant differences in COPM scores, after fathers' education status and number of associated problems were controlled.
Conclusions: The activity limitations and participation restrictions of people with CP and ID are similar. They have similar wants, needs, expectations. So, the interventions should focus to similar tasks. However, our results should be interpreted with caution since the participants' age range was very wide, and proxy measurement.

PP-07.12
Brain findings in relation to cognitive outcomes in preterm children at school age

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Objective: It is well established that a preterm birth is associated with an increased risk for cognitive deficits that often remain undetected until school age. Such deficits are likely caused by an atypical neurodevelopment. There is, however, relatively little known about the characterization of the brain in preterm born children in relation to long-term

cognitive performance. The present study explores whether brain volumes in preterm born children at school age relate to their cognitive abilities.
Methods: A sample of preterm children (*n*=32) and typically developing fullterm children (*n*=38) at 7–8 years underwent 3-Tesla magnetic resonance imaging (MRI) with additional synthetic MR for extraction of brain tissue. MR-findings were related to performance on the Wechsler Intelligence Scale for Children, 4th edition (WISC-IV).
Results: The preterm children performed significantly poorer than fullterm peers on the WISC-IV in terms of total IQ (M=95.1 and 103.5, respectively) and other measures. Overall, the total brain volume was positively correlated with general cognitive ability (total IQ). In addition, a significant relation between grey matter (GM) and IQ was found for the preterm children. However, no association between white matter (WM) and IQ was found.
Conclusions: Even in a small sample of school-aged children with a history of birth comparatively close to term, it was possible to detect a link between atypical brain volumes and cognitive functioning. The nature of these associations is discussed in terms of how GM and WM may contribute to long-term cognitive deficits associated with a preterm birth.

PP-07.13
Subtelomeric MLPA analysis of the patients with nonsyndromic mental retardation

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Objective: Mental retardation affects 1–3% of the population through different etiological reasons. Subtelomeric regions are more susceptible to abnormalities giving rise to mental retardation and subtelomeric analyses are being more important day to day in patients with mental retardation. The copy number changes of subtelomerik regions had been searched in multiple congenital anomaly and/or mental retardation groups before and the detection ratio of subtelomeric anomalies is changing between 4% and 10% in different study groups.

Subtelomeric regions are wealthy for genes that account for normal neuronal morphogenesis and normal embryologic development of mentality. We aimed to search an association between nonsyndromic mental retardation and subtelomeric rearrangements. Also mapping the subtelomeric rearrangements in nonsyndromic mental retardation patients may contribute identifying the candidate genes.
Methods: 29 patients aging from 1 to 23 years-old with normal karyotype were included to study. MLPA analyses were performed with DNA samples to assay the subtelomeric regions (P070).
Results: We found copy number alteration in three of our patients, two of them were decrease of FBXO25 probe array region and 1 of them was an increase of PPAP2C probe array region. The results of five patients were not suitable for assessment. As a result we detected the ratio of subtelomeric copy number alteration in nonsyndromic patients as 12.5% (3/24).
Conclusions: This was the first MLPA method application in NSMR patients of our unit to detect subtelomeric copy number changes. It is thought MLPA is a sensitive and rapid method so that it can be used for the other patient groups, too.

PP-07.14
Assessment of sagittal plane curvatures of spine in children with mental retardation

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Objective: Abnormal postural adaptations can be seen in children with mental retardation (MR) due to insufficient perception. Moreover, pathophysiological changings in cerebellum, brain stem and pyramidal system may lead spinal deformities. The purpose of this study was to evaluate sagittal plane curvatures of spine in children with MR comparing with healthy controls.
Methods: Twenty children with MR (10.55 ± 2.50y old; 16 boys, four girls) and 20 healthy controls (10.55 ± 2.50y old; 17 boys, three girls) were included to the study. Cervical lordosis, thoracic kyphosis, lumbar lordosis were measured with flex ruler. Height of curvatures were calculated and used for data analysis. Anterior cervical tilt was measured with goniometer. Student *T* Test was used for statistical analysis.
Results: Cervical lordosis was significantly lower in MR group (p=0.006). Furthermore, thoracic kyphosis and anterior cervical tilt were higher in MR group (p=0.017 and p=0.000, respectively). Lumbar lordosis values were similar in groups (p=0.994).
Conclusions: Increased anterior cervical tilt may be a compensatory adaptation to decreased cervical lordosis. As a result, changings in cervical and thoracic sagittal curvatures indicate insufficient postural control of head and upper

trunk. Physiotherapy approaches should focus on postural alignment involves upper trunk and cervical region.

PP-07.15
Neurodevelopment evaluation in children with congenital hypothyroidism by Bayley-III

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Background: Congenital hypothyroidism is the most common reason of mental retardation, and normal neurological development can be provided by early and effective treatment. In this present study, it is aimed to compare neurological developments of patients in 6–42 months of age with congenital hypothyroidism and healthy controls of the same age group prospectively by Bayley III test.
Methods: In this present study, neurological developments of 41 congenital hypothyroidism cases and 39 healthy controls, who applied to Pediatric Endocrinology Section of Mersin Children Hospital and Pediatric Neurology Outpatient Clinic of the Medical School at Mersin University between years 2009 and 2011, were evaluated by Bayley III test.
Results: Cognitive, language and global motor scores in addition to receptive communication, expressive communication, fine motor and gross motor subscores in children with congenital hypothyroidism were statistically significantly lower than those in the control group ($p<0.05$). It is detected that initiation dose and day of treatments, severity of hypothyroidism and time to normalization TSH had no statistically significant effects on neurological development of the study group ($p>0.05$). In both groups, as the education levels of mothers are increased, language development scores are also increased ($p<0.05$). Additionally, statistically significant increases in Bayley III scores except cognitive scores have been observed in both groups as the level of income is increased ($p<0.05$).
Conclusions: Despite early and effective treatment in newborns with congenital hypothyroidism, retardation in neurological developmental is detected. It is believed that this situation can be related to influences on brain development in intrauterine period. According to our present knowledge, this study is the first case–control study in the literature that neurological developments of CH patients are evaluated with Bayley-III score.

PP-09.2
Predicting factors for successful social functioning of adolescents with visual disabilities: the role of disability factors in a longitudinal scientific perspective

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Objective: What is the role of different factors in predicting social functioning of adolescents who have a visual impairment? With this knowlegde we can further improve our rehabilitation and support for young persons with impairments.
Methods: Unique longitudinal scientific results will be presented from a Dutch community-based national study into predictors of successful social functioning of adolescents and young adults who have a visual disability. The first large group of participants were interviewed three times: in 1996, 2005 and 2010. The second cohort of adolescents with visual disabilities is interviewed twice: in 2005 and 2010. Furthermore, the parents of these adolescents participated in a study on parenting. This is one of the few international studies with a longitudinal design based on multi-informant sources on this topic.
Results: Results showed significant lower scores on social functioning variables for youth with visual disabilities. However: some participants participated relatively well as others didn't. What are the significant predictors of successful social functioning? Included factors are: disability factors like severity or onset; personal characteristics like gender or age; adjustment characteristics like self-esteem or acceptation of the disability; and family factors like parenting styles, (over) protection. Which factor seems to be the most important one? Preliminary findings point to contextual factors rather than disability factors.
Conclusions: We recommend professionals working with youth who have disabilities to pay attention to all influencing factors in their lives. Several suggestions concerning different strategies how to achieve this, will be discussed.

PP-09.3
Visuo-spatial perceptual profile in two groups of developmental disorders: preterm and dyspraxic children

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Objective: According to the literature, visuo-spatial impairment was reported in both pre-term and dyspraxic children. However the tests usually used to assess these impairment required high level process. But, in order to be

able to propose adapted remediation, it seems more useful to assess elementary visuo-spatial process.

Methods: In the present study, we proposed to assess the elementary visuo-spatial perceptual profile in two groups of children (10 pre-term and 10 dyspraxic children, aged 4–12y old). We selected elementary visuo-spatial tasks likely to involve the dorsal occipital cortex (comparison of lengths and sizes) or the dorsal posterior parietal cortex (midline localization, angle processing, and relative dot/square localizations). The whole test included six adapting sub tests of the most elementary visuo-spatial functions already used in adult neuropsychology. Then, we compared the scores of our participants (10 pre-term and 10 dyspraxic children) with normative data obtained from a population of 96 healthy children aged 4–12 years old.

Results: For the whole test, our two population of pre-term and dyspraxic children showed lower performance than the control group. But, pre-term children participants showed particularly lower performance to midline localization, angle processing, and relative dot/square localizations tasks than to comparison of lengths and sizes tasks. However, some dyspraxic children participants showed the same profile.

Conclusions: We conclude that children suffering from different developmental disorders, as prematurity or dyspraxia, could present same visuo-spatial perceptual and/or attentional selection defects and that these defects could be related to the dorsal posterior parietal cortex.

PP-10.1
Lack of association of childhood partial epilepsy with brain derived neurotrophic factor gene

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Objective: Brain-derived factor (BDNF) is a member of neurotrophin family and is localized and upregulated in areas implicated in epileptogenesis. Several lines of evidence make the BDNF gene a plausible candidate gene for predisposition to epilepsy. In a study significant correlation between the C270T polimorphism in the BDNF gene and partial epilepsy (PE) reported in the Japanese population. In search of a specific genetic factor that may enhance or inhibit posttraumatic development of epileptogenesis, Peltola et al suggested a cytokine gene polymorphism as a possible candidate. In this study we tested that BDNF might be involved in the etiology of childhood PE.

Methods: To asses whether BDNF gene C270T polimorphism could be implicated in vulnerability to PE, we conducted a case-control association analysis (112 PE and 100 controls) in Turkish children. Epileptic children were divided into two groups: (i) idiopathic (n=85) and (ii) symptomathic epilepsy (n=27). There was no significant difference in genotypic distribution and allelic frequencies of the BDNF gene C270T polimorphism between the PE and control groups.

Results: However, the BDNF gene TT genotype was more frequently seen in the epileptic children (15 vs 11 patients, respectively). Interestingly, in the epilepsy group both two children with TT genotype have posttraumatic epilepsy.

Conclusions: The data indicate a possible association with the 270T genotype of the BDNF gene with a posttraumatic epilepsy. To draw any conclusion, further studies using larger sample sizes should be carried out in various ethnic populations in childhood epilepsies.

PP-10.2
Research of autoimmunity in newly diagnosed patients with epilepsy and febrile convulsion

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Objective: Evidences about role of autoimmune mechanisms in patients with epileptic and febrile convulsion as an etiological cause are gradually increasing. In this study, we desired to investigate the relationship between both paroxysmal disorders and autoimmunity.

Method: 32 patients and 16 healthy children were included in the study; Anti Glutamate-NMDA receptor, Anti-GAD and Anti-Ganglioside antibodies levels were evaluated.

Result: Anti-Ganglioside antibodies found positive at about one third of patients (34.4%). Compared with control group (18.8%), this ratio was 43.8% (p>0.05) in epilepsy group and 25% (p>0.05) in FC group. In study group, the average age of patients with autoantibody positivity was significantly lower than average age of patients with negative result (p<0.05). These values were also significantly lower in epilepsy group (p<0.05). Also while EEG positivity were found significant in all of four FC patients who have Anti-Ganglioside GT1b positivity (p<0.05); this positivity were not found significant in epilepsy group (p>0.05).

Conclusion: As a result of this study, it is determined that autoantibody positivity may be stimulator in terms of risk of epilepsy and persistent EEG disorder in patients with newly diagnosed epilepsy and FC; lower patient age may be associated with autoantibody positivity.

PP-10.5
A study of the prevalence of epilepsy: experience from Turkey

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Purpose: This study was intended to determine the prevalence of epilepsy among schoolchildren aged 7-16 in Erzurum, Turkey, between April 2009 and April 2010.

Methods: The study sample consisted of 5571 selected using the 'proportional stratified sampling technique' from a student population of 74 732 in the Erzurum provincial center.

Key Findings: The survey results identified 16 epileptics (4/1000) – six females (3/1000) and 10 males (5/1000). Age-adjusted prevalence rates for the male, female and total populations were 4.5/1000, 2.6/1000 and 3.6/1000, respectively. Prevalences of active epilepsy for males, females and both combined were 4/1000, 2/1000 and 3/1000, respectively. A family history of epilepsy was determined in 43% of epileptic individuals, while the history of febrile convulsion was 50% positive. Risk factors for epilepsy were previous meningitis in 6.2%, oxygen deprivation during birth in 18.7%, head trauma in 12.5% and brain tumor in 6.2%.

Significance: Analysis of all the study data together shows that epilepsy is still a significant health problem for our region and that a low socio–economic and educational level is a significant risk factor for epilepsy. The prevalence of epilepsy in the 7–16 age group in Erzurum 7–16 is closer to that in developed countries than in developing ones.

Keywords: Epilepsy, prevalence, students, Turkey

PP-10.10
The utility of tilt table testing with video EEG in children with recurrent loss of consciousness

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Objective: To detect the utility of tilt table testing with video EEG in children with unexplained, recurrent loss of consciousness episodes.

Methods: Continuous ECG monitoring, blood pressure, heart rate and video EEG were recorded during the test. The test was terminated if syncope or presyncope with 30% decrease in heart rate and/or systolic blood pressure occured. Regarding encephalography, average amplitudes and frequencies at the baseline, tilt up position, presyncope, syncope and post-syncope period were evaluated from frontal, temporal and parieto-occipital areas.

Results: There were 29 children with a mean age 13.83 ± 3.3 years. Syncopal attacks were cardioinhibitory in one of 12 (8.3%), vasodepressor in four of 12 (33.3%), mixed type in six of 12 (50%) and psychogenic in one of 12 (8.3%). The initial normal EEG pattern was followed by a diffuse generalized slow high amplitude brain activity at the syncope period. In the tilt positive group, compaements of average amplitudes and frequencies at the baseline, tilt up position and post-syncope period showed no significant differences. There were significant differences in the amplitudes of frontal regions between the baseline and presyncope period (p=0.016 and 0.027, right and left hemispheres, respectively). There were also significant differences in the amplitudes of frontal and parieto-occipital regions and in the frequencies of the bilateral parieto-occipital regions in the baseline and syncope period (p<0.05).

Conclusions: Tilt table testing with video EEG is useful in children and allows systematic description of electrocerebral abnormalities during the loss of consciousness.

PP-10.11
Epilepsy surgery in inractable epilepsy in children: a single center experience

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Objective: The frequency of intractable epilepsy is 20–30%. Epilepsy surgery is a an accepted modality of treatment in intractable epilepsies in children. We present here our experince in children with intractable epilepsy in a single center in Istanbul.

Methods: This is a retrospective review of children presenting to pediatric neurology and pediatrics neurosurgery clinics between 2006 and 2011 at Acıbadem University. Out of 500 children with intractable epilepsy 26 children was an appropriate candiate and/or was willing to have epilepsy surgery

Results: We did invasive video monitoring on seven patients, intraoperative electrocorticography on six patients. When we divide the patients according to surgery types, lesionectomy was performed on six patients, lobectomy on nine patients, multilobar resection on three patients, hemispherotomy on four patients, corpus callosotomy on two patients and hypothalamic hamartoma resection in two patients. Cortical dysplasia was found in 12 patients (46%), low-

grade tumor in three patients (11%), high grade tumor in two patients (7%), hippocampal sclerosis in one patient (3%) and hypothalamic hamartoma in two patients (7%). Fourteen patients were seziure-free (54%) at the end of at least 6 months of follow-up period (three patients were off of all antiepileptic medications, 11 patients seizure-free but still on antiepileptic medications), eight patients (30%) had >90% decrease of seizures, four patients (15%) had 50–90% decrease in seizures, two patients had no change in the number of seizures.

Conclusions: Epilepsy surgery should be considered early in treatment of intractable epilepsies in children.

PP-10.13
Infantile spasm: aetiology, treatment modalities, prognostic factors and outcome

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Objective: The objective of this study was to investigate the demographic, semiological, electroencephalographic and radiological features of the cases with infantile spasm. Treatment modalities, response rates, etiology and prognostic factors effecting the outcome were given.

Methods: The study group included 216 cases (99 girls – 117 boys) of infantile spasm who were diagnosed and treated at Ege University Medical Faculty, Department of Pediatrics, Division of Child Neurology, between 1993 and 2010.

Results: The median age of spasm onset was found 7 months. Developmental delay prior to the onset of spasms were noted in 71% of the cases. Most frequent electroencephalography findings were hypsarrhythmia (45%), and modified hypsarrhythmia (29%). Ninety percent of the cases were classified as symptomatic while the rest were cryptogenic. Hypoxia (37%), metabolic disorders (20%), infectious diseases (11%) and cerebral developmental disorders (10%) were found as the most frequent etiological factors. Vigabatrin was the most preferred first drug (62%) which was followed by ACTH (27%). Twelve percent of the cases were developmentally normal at the end of 1-year follow-up while the rest had developmental abnormalities in different severity. Active epileptogenesis requiring antiepileptic drug medication at the last follow-up was noted in 93% of the cases and 14% of them were considered to have drug-resistant epilepsy. Etiology was found as the main predictive factor effecting all prognostic parameters.

Conclusions: Infantile spasm has a high morbidity rate all over the world. The etiology appears to be the most important prognostic factor in this catastrophic epileptic encephalopathy.

PP-10.15
Quality of life in childhood epilepsy, parental and pediatric anxiety: the role of a structured education programme

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Objective: Determining the possible change in anxiety and quality of life of the child and parental anxiety with a structured education program about epilepsy for parents and children who were diagnosed as epilepsy at most 3 months ago.

Methods: Seventy-two epileptic children and their parents were included in the study. I. group had at least two afebrile seizures and were planned to start antiepileptic drugs. II. group was composed of patients on follow-up in the outpatient clinic, having antiepileptic therapy for at least 1 years, and III. group was composed of patients with intractable epilepsy. Questionnaires were applied to patients and their parents in the I. group before and 6 months after the education.

Results: For the I group, post-education scores were in positive correlation with family income, family income per person; in negative correlation with seizure frequency, parent state and trait anxiety. When State-Trait Anxiety Inventory which was applied to evaluate parental anxiety scores, were compared for the I group as pre and post-education, a significant decrement was seen both in state and trait scores. Anxiety Scale for Children' was also compared for the I, II and III groups and decrement was seen for the I group after the education. When Child Quality of Life Scales were evaluated, for the I group, 'Scale Total Scores' and 'Psychosocial Health Total Scores' were significantly higher in the post-education scales in the first group.

Conclusions: Giving information to the families about epilepsy with oral and visual ways, will decrease the anxiety level in time, increase drug compliance and possibly provide a better seizure control.

PP-10.16
Analysis and follow-up of patients with infantile spasms

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Objective: An evaluation of clinical profile, to determine the associated risk factors, and follow up the patients with Infantile spasms (IS).

Methods: Total 109 patients (59 boys, 50 girls) diagnosed with IS between 1984 and 2009 at Eskisehir Osmangazi University, Pediatric Neurology Unit were analyzed. The response of seizures to various therapeutic modalities, the final developmental status, presence of motor disability and evolution of IS to Lennox-Gastaut Syndrome were taken as primary outcome variables.

Results: An onset of infantile spasms ranged from 0.1 to 24.0 (mean 6.8 ± 4.9) mo. Prenatal, natal, and postnatal risk factors were present in 30.0%, 62.0% and 66.0%, respectively. Microcephaly was seen in 42.9%. Neuroimaging studies revealed different abnormalities in 75.7% of patiens. Etiology of IS was idiopathic in 17.4%, and symptomatic in 82.6%. Perinatal encephalopathy and congenital central nervous system abnormalities were most common causes in the symptomatic patients (54.4, 18.9%, respectively). Initial spasm cessation rate was significantly higher in the patients who were only received ACTH therapy than who were only received antiepileptic drugs. After the average 28.1 months follow-up period, drug refractory epilepsy (58.5%), LGS (23.4%), mental/developmental retardation (84.6%), motor deficits (55.4%) and autism (39.0%) was developed. The presence of neurodevelopmental retardation (before onset of IS or after therapy), no cessation of seizures with initial antiepileptic drug or ACTH therapy, early relaps time after ACTH therapy, symptomatic etiology, presence of microcephaly, abnormal neuroimaging findings, and development of cerebral palsy were found as negative prognostic factors.

Conclusions: Adverse perinatal events are important and preventable etiological factors.

PP-10.7
Febrile convulsion prevalance among children aged 1 month to 5 years in Erzurum City, Turkey

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Objective: Febrile convulsion prevalence was not investigated before in Erzurum. This study aimed to demonstrate the prevalence of febrile convulsion in children between the age of 1 month and 5 years, in the city center of Erzurum.

Methods: A cross sectional study was designed. The necessary sample size was calculated as 1964. Two thousand one hundred and sixty children were selected by proportionate stratified sampling method from the patient lists of general practitioners. Participants were invited to the hospital where one researcher applied a questionnaire with 27 questions face to face to the parents, querying demographic data and information about FC history. One thousand nine hundred and sixty-seven children (91%) participated to the study. Results were evaluated by the SPSS software.

Results: A total of 126 children (6.4%) had a history of febrile convulsion (71 boys [7.2%] and 55 girls [5.6%]). Febrile convulsion history in children with and without a positive family history was 13.4% (n=45) versus 5.0% (n=81) respectively (p<0.001). Although the prevalence of febrile convulsion was found 2.7% higher in those with a history of asphyxiation at birth this difference was not statistically significant (p=0.293). The prevalence of febrile convulsion was 8.6% (n=14) in preterm whereas 6.2% (n=112) in term and post term babies (p=0.225).

Conclusions: We have concluded that having a history of febrile convulsion in the family is an important risk factor. The prevalence of febrile convulsion among the age group of 1 month – 5 years old children in Erzurum is comparable with the developed countries.

PP-12.10
A review of the presentation and management of childhood spina bifida in the Northern Region, of the UK

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Objective: The GNCH is a tertiary referral centre for the management of childhood SB in the Northern Region and historically, all infants born with Open SB have been seen by the paediatric general surgical team. In this study we evaluated a cohort of patients with Open and Closed spina bifida (SB) in order to review their presentation and management.
Methods: We undertook a retrospective notes review of patients with SB born between 1982 and 2011.
Results: The notes of 69 children were analysed, of whom 35 had Open (18 female) and 34 had Closed (26 female) SB. For Open SB; the commonest location was lumbar (22/32). 19/26 were antenatal diagnoses but a quarter (7/26) were postnatal. 24/35 had hydrocephalus and 16 required insertion of a ventriculo-peritoneal shunt. Prior to operation, the rate of increase of head circumference during the first month of life was ≥1.5× normal.
For Closed SB; the commonest location was sacral (16/33). Thirteen cases presented between 0 and 15 years with gait abnormalities (3), leg pains (3) and back pain (2). A soft tissue lump was present in 5 but there was no visible abnormality in 2.
Conclusions: In the Northern Region, the prevalence of childhood SB is evenly distributed between Open and Closed cases. For Open cases, decisions regarding shunting might be assisted by calculating the rate of increase of head circumference within the first month of life. For Closed cases, neurological abnormalities affecting the back, leg and gait should prompt suspicion, even if soft tissue abnormalities are absent.

PP-12.11
ICF as a roadmap for planning neurorehabilitation in a paediatric hospital: follow-up after a 3 years implementation

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Objective: Three years after the introduction in a pediatric neurorehabilitation hospital of an ICF-CY based form for rehabilitation projecting/programming, we follow-up on that experience by probing the impact that this process had on stakeholders.
Methods: Two-hundred two rehabilitation projects/programs for children with various neurologic health conditions admitted for intensive rehabilitation were completed in 36 months. Assessment was carried out by (i) evaluating the compliance with the new process design and the resource consumption, (ii) an appraisal of the perceived added quality. A structured questionnaire built by clustering statements about added quality determinants in rehabilitation expressed by team members and families explored the perceived change in the rehabilitation process associated with the introduced form with a 0–5 Likert-type scaling.
Results: Most project/program forms were filled appropriately, allowing the link of functional problems, objectives, rehabilitation activities, and outcome indicators. Resource consumption was not increased by the implementation of the new form. Questionnaire scores were 3.25 SD 0.2 for team members and 4.05 SD 0.2 for families, showing general positive impact.
Conclusions: The results confirm the feasibility of ICF implementation in the clinical setting. Such process can be achieved without substantial increase in resource allocation. ICF based project/program was appreciated by both team members and caregivers as adding quality to the rehabilitation process. These results further encourage the diffuse use of ICF based tools in the clinical sector.

PP-12.8
Implementation of a guideline for diagnosis and treatment of cerebral palsy: experiences from clinical practice

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Objective: To share experiences with the implementation of the Dutch guideline for Cerebral Palsy (CP).
Background: In 2006, the Dutch Guideline for Diagnosis and Treatment of Children with Spastic Cerebral Palsy has been published. The recommendations in this guideline are evidence-based and represent the state-of-the-art in diagnosis, assessment and treatment according the AGREE methodology. In this study we examined the

implementation of the recommendations with the highest level of evidence.

Methods: Using a network of Knowledge Brokers (KBs) from 12 rehabilitation centers, at first a survey was done to examine the familiarity with and use of the recommendations with the highest level of evidence from the CP guideline. Secondly, in discussion groups consisting of the KBs, researchers, parents and experts that were involved in the development of the guideline, the interpretation and actual implementation was discussed.

Results: From the survey it was concluded that of the 36 recommendations on the average 93.1% (range 55.6–100%) of the centers reported that they applied the recommendation in clinical practice. However, in the discussion groups it became clear that the recommendations as well as the definition of application in clinical practice were multi-interpretable. These discussion groups were important in reaching uniform interpretation of the recommendations, and in discussing ways how to implement them in clinical practice.

Conclusions: Implementation of guidelines in clinical practice can be increased by making recommendations more specific and by using a network of KBs, parents and researchers to support the implementation. Experiences on the chances and barriers in guideline implementation will be shared.

PP-12.9
Intra-individual motor trajectories of very preterm born infants up to 6 months corrected age

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Objective: Preterm born infants appear to have their own pathway in different aspects of their development. With regard to motor development, early identification of problems using repeated measurements is important in guiding intervention. This study aims to explore intra-individual variability of early motor developmental trajectories in very preterm born infants.

Methods: The postural control and motor development of 113 infants born with a gestational age <30 weeks or a birthweight <1000 g were examined three times. The Test of Infant Motor Performance (TIMP) was used at term-age and at 3 months corrected age (CA) and the Alberta Infant Motor Scale (AIMS) at 3 and 6 months CA and compared to norm values of full-term and preterm born infants (AIMS only). We analysed within-subject differences in *Z*-scores (*T*-test). In addition, classified into normal, suspect or delayed motor development with cut-off points of −1 and −2 standard deviation, the stability of the classification over time was examined (χ^2). Besides, the correlation between the TIMP and AIMS scores at 3 months CA was determined (Pearson).

RESULTS: Individually, the level of motor performance varied significantly over time, and many infants changed categories once or twice. At T2, the correlation between TIMP and AIMS scores was.77 (p<0.000).

Conclusions: The value of early prediction of motor developmental problems is restricted due to intra-individual variability. However, the variability in intra-individual motor trajectories advocates a developmental surveillance during a neonatal follow-up program to determine the need of early intervention, instead of decisions on single point assessments.

PP-13.1
Intercultural differences in compliance to developmental follow-up programs after preterm birth

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Objective: Early identification of preterm born children at risk for neurodevelopmental problems is an important issue for parents and pediatric neurologists. In this study we evaluate intercultural differences with respect to compliance to multidisciplinary follow-up programs for children born before 34 weeks gestation (WG).

Methods: Data were collected retrospectively for neonates born before 34 WG between 1/2003 and 6/2008. The follow-up program includes six evaluations by a pediatric neurologist and physiotherapist before evaluation by Bayley scales of Infant Development II (BSID-II) is performed at age 30 months. Parents receive an invitation letter for each appointment.

Results: 540 patients were included. Thirty-four per cent had a complete follow-up at age 30 months. Sixty-six per cent had no or incomplete follow-up. Three hundred thirty-five children were of Belgian origin. Forty-four per cent of these had a complete follow-up at age 30 months. Most of the 205 other children were from Arab (56%) or

Black African (33%) origin. Of these, 18% had a complete follow-up at 30 months. This number was significantly lower compared to children of Belgian origin.
Conclusions: Despite a structured follow-up program with an active recruitment strategy for preterm born children, many are lost to follow-up. Especially children of other than Belgian origin are at risk to drop out at an early stage of the follow-up program. Reasons for early loss to follow-up should be investigated in more detail. A culturally appropriate explanation of the goals of the follow program should be communicated to the parents before the preterm born baby leaves the neonatal care unit.

PP-13.3
Group Stepping Stones Triple P: evaluation of a preventative parenting intervention for parents of a child with a disability

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Objective: To evaluate the effects of a parenting intervention aiming to reduce dysfunctional parenting practices, parental mental stress and child behavior problems in families of a child with a disability.
Background: Stepping Stones Triple P (SSTP) is a variant derived from the preventative parenting program Triple P and has been specifically designed for families of a child with a developmental disability. While Triple P has been proven to be effective in Germany, this research was the first to evaluate outcomes of SSTP.
Design/Methods: The study was designed as a controlled clinical trial in a health services research setting. Group SSTP was implemented in 31 German social-paediatric centres (SPZ). Participants were 118 parents of children with a developmental disability or delay (aged 1–17y). Measurements via self-report questionnaires took place pre, post, 6 and 12 months after training.
Results: Dysfunctional parenting practices, parental stress and child behavior problems were significantly reduced and maintained. Post training, parents reported fewer conflicts over child rearing, improved the health-related quality of life of the handicapped children as well as higher levels of self-efficacy and parenting satisfaction. Side-effects (e.g. increased family burden due to time commitment) were only temporary. Psychosocial burden narrowed training effects but did not annihilate them. Parental engagement had little moderating impact on training effects. Parents of children with motor impairment reported higher reductions of parental stress and child behavior problems compared to parents of children without motor impairment, who achieved higher improvement of parenting styles and higher effects concerning the reduction of parental anxiety and depression. Program content was rated highly acceptably and parents were satisfied with the intervention.
Conclusion: The results suggest that Group SSTP is an acceptable intervention and effective in improving child and parenting variables in families of children with different levels and kinds of disability.
References: Hampel OA, Hasmann SE, Schaadt A-K, Holl R, Petermann F, Hasmann R. Effekte des Stepping Stones Elterngruppentrainings für Familien mit behinderten Kindern. Kindheit und Entwicklung 2010; **19:** 36–46.

Hampel OA, Schaadt A-K, Hasmann SE, Petermann F, Holl R, Hasmann R. Evaluation von Stepping Stones Triple P: Zwischenergebnisse der Stepping Stones SPZ-Multicenterstudie. Klinische Pädiatrie 2010; **222:** 18–25.

Hasmann SE, Hampel OA, Schaadt A-K, Holl R, Petermann F, Hasmann R. Psychosoziale Aspekte bei motorischen Behinderungen. Monatsschrift Kinderheilkunde 2010; **158:** 463–70.

PP-14.10
Myoclonus associated with anesthetic agent use: a case report

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Objective: Myoclonus is sudden, quick muscle movements without loss of consciousness; it generally involves both half of the body. Myoclonus may develop due to non-epileptic myoclonus, epileptic myoclonus, hypoxic-ischemic episodes, congenital brain anomalies, mitochondrial diseases, systemic diseases, myoclonic absences, myoclonic epilepsy, drugs and toxins.
Methods: In this study, two cases, in which myoclonus developed due to ketamine use during MR imaging in one and due to penthotal-fentanyl-listenon use during tonsillectomy in other, were presented.
Results: Case 1: A 15 years old girl was referred to our department with a diagnosis of convulsion. History of the patient revealed that she underwent to tonsillectomy operation; she was referred with initial diagnosis of convulsion.

Pentothal-fentanyl-listenon was used during operation. Symptoms were regressed at postoperative day 3 in this case, in which myoclonus taken under control by piracetam infusions.

Case 2: A 8 years old boy was referred to our department for further evaluation with a diagnosis of mental retardation. Low dose intravenous ketamine was administrated to the patient, who was scheduled to magnetic resonance imaging for etiologic evaluation. Myoclonus was observed across whole body at recovery phase after magnetic resonance imaging. Myoclonus was taken under control by piracetam infusion and symptoms were regressed at day 3.

Conclusions: Even though rare, myoclonus associated with anesthetic drug use may be seen. Piracetam infusion can be used in the management of these patients.

PP-14.14
Resistant chorea successfully treated with intravenous immunoglobulin: a case report

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Objective: We report a 12-years-old girl with carditis and generalise chorea and successfully treated with intravenous immunoglobulins (IVIG). Sydenham chorea (SC) is the most common cause of acquired chorea in children. SC occurs primarily in populations with untreated streptococcal infections. An impressive list of therapeutic options has been used to treat this disorder: amphetamines, steroids, haloperidol, valproic acid (VPA), carbamazepine, chlorpromazine, phenobarbital, plasma exchange and IVIG.

Results: A 12-years-old girl patient was admitted our hospital, with complaint of intermittent swelling, redness, pain in the joints, palpitations, involuntary movements and imbalance. On physical examination, she presented a grade III–IV/VI° holosystolic heart murmur, mood disorder and generalise choreic movements. Cardiovascular evaluation showed serious mitral insufficiency. Laboratory examinations revealed elevation of acute-phase reactants. Other possible causes of chorea were excluded by serological markers and cranial magnetic resonance imaging. Prednisone and VPA treatment were started. On 7th day of hospitalization, patient's clinical status was worsened and VPA treatment switched to haloperidol. On the 4th day of haloperidol, it was stopped because of emerging extrapamidal side effects and IVIG was started and continued 4 days. After 48 hours last dose of IVIG, clinical findings including choreic movements and mood disorder were significantly improved.

Conclusions: IVIG seems a reasonable treatment option for the chorea cases resistant to anticonvulsant and dopamine antagonists. This case report shows that IVIG is an effective treatment, although larger studies are needed to confirm this conclusion.

PP-14.15
Clinical and neuroimaging findings of Sydenham chorea

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Objective: Sydenham's chorea (SC) is a late manifestation of acute rheumatic fever and characterized by involuntary movements which cause the functional impairment. Motor disorder is mostly generalized but can be unilateral and associated with hypotonia and muscle weakness. The aim of this study is to describe the clinical and neuroradiological characteristic of children with SC.

Methods: Seventeen patients with SC were admitted to Child Neurology Unite. The diagnosis of SC was based on Jones citeria. Other causes of chorea were excluded. Characterisitcs of involuntary movements, localization and severity of chorea, treatment and recovery time were evaluated. ASO, sedimentation rate, cardiological investigations and cranial MRI were done in all children.

Results: The mean age was 11.2 years and patients were predominantly female (76%). Of the 17 patients 4 had carditis, rest of them SC was the only major finding. Seventy of chorea was mild in 1 patient, moderate in 4 and severe in 12. Two patients had chorea paralytica. Eleven patients had generalized and 6 of them were hemichorea. Cranial MRI revealed white matter changes on subcortcal, cortical, periventricular and caudate nuclei in seven (41%) patients. All patients were taken sodyum valproate. In addition two patients with chorea paralytica were given high dose prednisolone and improvement was observed. The mean recovery time was 3.3 (1–8) months.

Conclusions: In conclusion although SC is a self-limiting, some patients can develop white matter and basal nuclei lesion due to inflamatory processes and it may be related to longer duration of the clinical features.

PP-14.2
Functional performance according to gestational age and birthweight in preschoolers born preterm or with low birthweight

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Objective: Evaluate the functional performance of preschool children born with different degrees of prematurity and low birthweight.
Background: There were few evidences about the impact at long term of these factors on the activities of daily living, independence and participation.
Methods: A cross-sectional study with 98 participants (aged from 2 to 7y) of a Follow-up Service in Brazilian southeast used the 'Pediatric Evaluation Disability Inventory- PEDI' to assess the children's functional abilities and independence level, in the areas of self-care, mobility and social function. The children with cerebral palsy were not included. It was used the chi-square test and the variance analysis to verify the association and the difference between groups according the degrees of prematurity (three) or birthweight (three) and the PEDI. In all analysis it was considered the significant level of α=0.05.
Results: There was found a delay of 10.2%, 12.2% and 14.3% in the functional abilities in the areas of self-care, mobility and social function, respectively, and of 11.2%, 19.4% and 15.3% in the assistance level received from the caregivers (independence), in the same areas. It was not found statistically significant differences or associations between groups of different degrees of prematurity or birthweight and the PEDI performance.
Conclusions: Preterm and low birthweight children demonstrated high rates of delay in functional performance at preschool age that did not varied in magnitude among different degrees of prematurity and low birthweight, suggesting that exist others factors contributing to the development outcome at this age.

PP-14.3
Play or practice? exploring a play-based intervention approach to enhance the quality of physiotherapy treatment in kindergartens

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Objective: Traditionally, physiotherapist focuses interventions at body structures and functions, as defined in the framework of International Classification of Functioning, Disability and Health (ICF). Resent research show that child-initiated, play- and context- based activities are best suited to optimize child development. This pilot-study follows a play-based intervention during a 12 week period for two children in their kindergartens. Objective is to explore how a play-based intervention-method affects professional roles and child performance.
Methods: A participatory action research design was applied. Two preschool children with restricted mobility, their physiotherapists, preschool-teachers and responsible special-education consultants participated. Video-recordings were made from five consecutive treatment-sessions in both kindergartens. After each session, excerpts from the recordings were analyzed in a focus-group consisting of the members from both teams. Audio-recordings from all meetings in the focus- group were made and analyzed. Evaluation-meetings with the professional participants and with the parents of the children were conducted. Canadian Occupational Performance Measure (COPM) was applied to measure changes in child development.
Results: Significant changes in child initiative, participation and motor performance in play with peers and professionals were documented. The use of video-recordings shows a considerable potential in promoting approaches to treatment based on the initiative, playfulness and interest of the child. The professionals reported a more nuanced perception and awareness of child-resources and challenges.
Conclusions: Play-based intervention has a significant impact on motor performance and child participation in play in the kindergarten. A shift towards more participation-based goals and interventions in these types of treatment-settings should be considered.

PP-14.4
Screening developmental coordination disorder with an 11 item test

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Objective: Screening DCD in a sample of 106 healthy children with an eleven item test which shows good psychometric properties. To children, until 5 years, DENVER test is used to screen the developmental delays. Children from 5 to 8 don't have a screening test with good properties.
Methods: The screening test was designed by three experts. The items were reviewed by a panel of four experts. Eleven items formed the screening test. A trained physiotherapist administered the test in a sample formed by 103 healthy

children chosen at random. Aged from 5 to 8, in Murcia metropolitan area. 52.4% are boys. The mean age is 6.47 years (SD: 1.12). Twenty-one children were chosen at random to measure reliability.
Results: The intra-and Interrater reliability (21 children) ICC is 0.98. The Cronbach's alpha coefficient is 0.73, which represents an adequate value. The coefficient based on the elements was 0.74. The ANOVA according to age p=0.001 (F: 15.406). The total corrected-correlation item-scale is between 0.701 and 0.3, except for items 1 and 6 which are below 0.3. According to a level of 90% of correct execution, 17 children (16.5%) are below the level proposed.
Conclusions: The test formed by the 11 items proposed are good as screening test, and it helps to decide if we need to make a more exhaustive evaluation. In a sample of 103 children chosen by random, 16.5% of them needed to be examined in more dept after administering the scale.

PP-14.5
Predictive value of general movements in preterm infants

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Objective: To explore the value of general movements (GMs) assessment in predicting neurological outcome at 3 years of age.
Methods: The study included 36 preterm infants. The GMs were assessed using Prechtl's method. The video recording was made 2 weeks after birth, at the age of 42 weeks post-menstrual age (PMA), and at 50 weeks PMA for each of 36 infants. All children were assessed at the age of 36 months of age with the aim of getting final motor developmental outcome.
Results: At the age of 3 years, 20 children had normal motor development: in writhing period 13 had normal GMs and 7 had poor repertoire, in the fidgety period all 20 had normal fidgety GMs. Twelve children showed minor neurological disfunction (MCD): in writhing period all 12 had poor repertoire, in the fidgety period 5 had abnormal fidgety GMs, and seven had normal fidgety GMs. Four children developed spastic cerebral palsy (CP) (1 unilateral, 3 bilateral). All of them had cramped synchronized GMs in writhing period and no fidgety in fidgety period.
Conclusions: Assessment of the quality of general movements in preterm infants is a sensitive method for investigation the integrity of the central nervous system. Prechtl method is an effective method for the detection of neurological deficits.

PP-14.7
Predictive power of the Test of Infant Motor Performance (TIMP) and gross motor development from 2 to 6 months of age in infants who remained in the neonatal intensive care unit

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Objective: Evaluate the motor development from 2 to 6 months of age in infants who remained in the Neonatal Intensive Care Unit (NICU), verify the predictive power and the best cut off point of the TIMP.
Methods: The sample consisted of 54 infants (19 females and 35 males), evaluated at the discharge from the NICU with the TIMP and followed through the Alberta Infant Motor Scale (AIMS) from 2 to 6 months of corrected age. For analysis, it was used Chi-square and Mann–Whitney tests, considering statistically significant values p<0.05 and trends in the lower to 0.10.
Results: Most infants presented in the AIMS performance below the 27th percentile in the months studied, and it was also found a high percentage of ratings altered (between 18% and 25%). The −2 SD was the best cut off point in TIMP, showing predictive values exceeding 72% in specificity, accuracy and VP negative in all studied months. It was also found a strong association between the AIMS and TIMP in the five (p=0.012) and 6 (p=0.009) months of age.
Conclusions: The most participants had low performance on the AIMS from 2 to 6 months of corrected age and the best cut off point at the time of discharge from the NICU seems to be −2 SD. To present a normal TIMP performance at the discharge from the NICU seems to be strong evidence that the infant will have a normal gross motor development in the first 6 months of corrected age.

PP-14.8
Management of dystonic hip subluxations with percutaneous screw hemiepiphysiodesis

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Objective: To present the early results of a new technique of management of hip subluxation in dystonic cerebral palsy

Methods: From the data base of 300 children with dopamine responsive dystonia, all who were on oral L-dopa, children with hip subluxation were sought. Thirty-two children with 46 hips were present, only 4 did not respond to l dopa and percutaneous adductor tenotomy, the present study analyses these 4 children managed with percuataneous screw hemiepiphysiodesis after 6 months of FU, all children were of GMFCS grade 5 all procedures completed under short general anaesthesia, operating time average 27 minutes under image intensification, day care procedure with <5 mL blood loss, single screw placed crossing the medial part of the capital femoral epiphysis on the involved side.

Results: After a period of 6 months of follow up 3 hips showed reduction in the degree of subluxation to <30% and one showed stabilization, none of the children had any complications or progress in subluxation

Conclusions: Management of hip dislocations in cerebral palsy is a difficult problem with usually relentless progress specially in GMFCS grade 5 with high reoperation rate and complication rates, the only recourse left to the surgeon is often doing open reduction with pelvic and femoral surgeries in a child with dystonia the surgeon is often perplexed as surgery is contraindicated due to fear of failure, percutanous screw epiphysiodesis offers a minimally invasive method of treatment, short term follow up shows it to be effective. Long term folllow up in a bigger cohort is required.

PP-15.3
Neck, shoulder, back injuries and their potential causes in caregivers of children with neuromuscular disorders

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Objective: The aim of the study was to investigate the neck, shoulder and back injuries in caregivers of children with Neuromuscular Diseases (NMD's).

Methods: Demographic characteristics of children and their caregivers were recorded. The functional and ambulatory status of children were determined by Brooke Functional Classification (BFC) and North Star Ambulatory Assessment (NSAA). Difficulties of caregivers (transfers and exercise) and former health problems related to neck-shoulder and/or back injuries were recorded. Neck Disability Index (NDI), Shoulder Pain and Disability Index (SPADI) and Oswestry Disability Index (ODI) were performed on caregivers. Caregivers' quality of life was assessed by Nottingham Health Profile (NHP).

Results: 67 children (mean age: 9.19 ± 3.19) and their caregivers (mean age: 36.66 ± 6.28) participated in this study. They were diagnosed with different types of NMD's. Forty-eight children (71.7%) were ambulant (1, 2 and 3 levels of BFC) and 19 (28.3%) were nonmabulant. Mean NSAA score of children was found 18.69 ± 12.10. There were not any differences in NDI ($t=-0.612$, $p>0.05$), ODI ($t=-0.598$, $p>0.05$), SPADI-Pain ($t=0.432$, $p>0.05$), SPADI-Disability ($t=-0.987$, $p>0.05$) and NHP total score ($t=-1.391$, $p>0.05$) between caregivers of ambulant and nonambulant children. Positive correlations were found between former health problems of caregivers related to neck, back and shoulder problems, difficulties of caregivers, NHP scores and SPADI-Pain, SPADI-Disability, ODI, NDI scores ($p<0.05$).

Conclusions: Caregivers' physical health and quality of life are under risk without considering the ambulatory status of their children with NMD's.

PP-15.7
Recurrent rhabdomyolysis attacks and acute renal failure in an adolescent: presentation of carnitine palmityl-transferase II deficiency

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Objective: Rhabdomyolysis may occur as an isolated episode or recurrently in children with hereditary metabolic disorders. Carnitine palmityl-transferase II (CPT-II) deficiency can be associated with rhabdomyolysis in particular conditions that increase the requirement for fatty acid oxidation such as high-fat diet, fasting, infections and prolonged exercise. We report a case of a 13-years-old female who developed a massive rhabdomyolysis and later complicated by acute renal failure during the course of upper respiratory infection.

Methods: She was admitted with myalgia, generalized muscular weakness, extremely dark coloring of urine. Medical history revealed that the patient experienced difficulty and cramps in long distance walking. She had five episodes of rhabdomyolysis triggered by infections previously. Two brothers had history of rhabdomyolysis.

Results: In physical examination, muscle strengths in proximal and distal muscles of upper and lower extremities were 4/5. Following this episode, serum creatine kinase peaked at 41 780 U/L. Aspartate aminotransferase and alanin aminotransferase were elevated at 888 and 695 U/L respectively. Blood urea nitrogen 57 mg/dL, creatinine 7.02 mg/

dL, serum myoglobin >1200 μg/L were detected. The patient was immediately given fluid supply combined with bicarbonate infusions. Haemodialysis was commenced because of hypertension with an increase in creatinine. Appropriate management brought about complete resolution. Among the attacks of rhabdomyolysis, serum creatine kinase, findings of electromyography were normal. Muscle biopsy revealed fibres with regular structure and normal size. Genetic analysis revealed homozygosity for the SI13L mutation in the CPT-II gene.

Conclusions: CPT-II deficiency should be suspected in children affected by recurrent rhabdomyolysis if trauma, infections, drugs or extreme exertion can be excluded.

PP-16.4
Evaluation of ultrasound use and sedation side-effects in a regional botulinum toxin rehabilitation clinic

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Introduction: Botulinum toxin (botox) has been in use for the management of spasticity in children over the last two-three decades. There has however been improvement in this area of rehabilitation with the introduction of ultrasound guided injection to specific muscle groups as supposed to blind or regional anatomy injections. In addition to the mode of delivery of the injections, different sedation and anaesthetic types have been used. The use of general anaesthetic has been associated with some side-effects but these have been minimized with the use of local or regional anaesthetic.

Aims: To highlight the significant post injection side-effect(s) observed by families

To identify the frequency of ultrasound use by personnel

To identify preferred mode of local anaesthetic and side-effects.

Methodology: Study carried out between October and December 2011. The preparation of Botulinum toxin A used is dysport. Patients are counselled before the procedure about the mode of anaesthesia available and the decision is left to be decided by them. Details of potential common side-effects of the injection are given to families. Details collected on to a proforma designed by the team. Data were collected at two visits (first on the day of the procedure and secondly at the review visit, where patients are seen by the therapist)

Results: Total numbers of patient seen were twenty-one (21) during the period. Age ranges of patients: <5 years (8), 5 and above (13 patients), Muscle groups- Bilateral Gastronemius, First injection were given to 15 patients, Repeat injection were given to five patients.

Ultrasound use: Used in nine cases, ultrasound was not used in 11 cases. Reasons were unknown possible related to operator. Anaesthetic used: Local- 3, Sedation- 5, Entonox- 1, In combination- (midazolam and entonox-3), (Midazolam and emla-8), (Entonox and Emla-1).

Adverse effects of sedation: Only two cases were identified, one patient was aggressive after sedation while another patient had extensive itching after sedation.

Adverse effects of Botox: Six cases were identified: Flu like symptoms in two (2), Loss of motor skills in three (3), Incontinence in one (1).

Conclusion: Overall, the side-effects seen with the botox have been previously reported. However the reported case of itching associated with sedation is an unusual one and the patient required admission overnight to make sure that this did not progress further. This is to highlight that although sedation may be safe as compared to general anaesthesia (previously associated with more systemic side-effects), unexpected side-effect should be looked out for.

PP-16.11
The effectiveness of virtual rehabilitation on balance parameters in a patient with hemiparatic cerebral palsy: a case report

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Objective: Balance difficulties are amongst the most frequent motor disorders of patients with hemiparatic cerebral palsy. The aim of this study to investigate the effects of virtual rehabilitation on balance parameters in a patient with cerebral palsy (CP).

Methods: The subject was a 16 years old, male with left hemiparatic CP. Socio-demographic data and clinical features were assessed. Balance functions before and after treatment were evalualted with one leg balance test, functional reach test, get up and go test, 10 meter walking test. The patient completed 24 sessions individually planed Nintendo-Wii balance games program. The Nintendo-Wii program was included 'tilt table', 'ski slalom', 'heading' and 'ball catch'.

Results: Balance ability improved for the patient after the wii balance games. One leg balance test time of hemiparatic side foot was 60.25 sn after the training whereas 6.87 sn. Functional reach test distance was 47 cm after the training whereas 34 cm. Get up and go test was 6.68 sn after the

training whereas 5.38 sn. Ten meter walking test time 7.28 sn after the training whereas 6.66 sn.
Conclusions: We consider that the Nintendo Wii may be offers an inexpensive, enjoyable, suitable alternative to more complex system for children with cerebral palsy.

PP-16.3
Using a virtual reality-based therapy system to address multiple deficits in children with cerebral palsy simultaneously

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Objective: In this study we used a glove-based virtual reality (VR) system, called YouGrabber® (YouRehab, Zurich, Switzerland), which is designed to improve upper limb motor function via bimanual training reaching and grasping.
Methods: Six children (four females, age 8.8 ± 1.4y) with congenital motor deficits participated in the study. A 4-week individualized VR training program (3–4 sessions/wk [*n*=2] and 1 session/week [*n*=4] was applied. No additional arm and hand training or any exercises to improve visual attention were provided during the duration of the study. Several assessments were performed to analyze motor behavior and visual attention.
Results: Only the BBT showed improvements in all subjects (at least in one hand). The YouGrabber Analysis Tool revealed that in all subjects the difficulty of the games could be increased after each training session while the efficiency of scoring (points per object) remained the same or increased, indicating improved performance. Also the interval and the speed of arriving objects could be increased in all subjects, revealing that the training intensity increased, measured in numbers of arm-/hand movements performed in one training session.
Conclusions: Preliminary results showed improvements in motor behavior, measured with the BBT. Further, gaze pattern analysis indicates higher visual attention and optimized focus on relevant game events, indicating higher visual concentration during the therapy session. We suggest that the VR-based motor rehabilitation system not only improves motor behavior but also visual attention. More detailed individual analysis on the assessed Tobii eye tracking data are required to understand the visual behavior in children with CP.

PP-16.6
Reliability of energy cost calculations in children with cerebral palsy, cystic fibrosis and healthy controls

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Objective: To study test-retest reliability of physiological cost index (PCI) and total cost index (TCI) in three groups of children. TCI modified PCI by excluding rest heart rate in calculation.
Methods: Energy cost was evaluated from two consecutive walking tests, and results were compared between methods, tests and groups. Thirty-nine children, eight with cerebral palsy, 11 with cystic fibrosis and 20 healthy controls, aged 5–16 years participated in the study conducted at the Clinical Nutrition and Metabolism laboratory, University Hospital, Sweden. Heart rate was recorded during sitting and walking at self-selected speed. PCI and TCI were calculated using both non-steady-state and steady state work heart rates. Test-retest reliability was analysed by mean of differences, pooled SD, coefficients of variation (CV%) and correlation coefficients.
Results: Reliability was high for both PCI and TCI. TCI showed consistently lower variation between tests than PCI for all groups. In the group with cerebral palsy, using non-steady-state showed highest reliability. The instruments were easy to administer and the test procedure was well tolerated by all the children.
Conclusions: Both PCI and TCI were reliable methods when calculating energy cost in children with cerebral palsy, cystic fibrosis and controls. TCI seemed to be a suitable alternative in the evaluation of gait efficiency in children.

PP-17.1
Severe neurological disability in the outcome of CMV meningoencephalitis

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Purpose: To study the characteristics and outcomes of cytomegalovirus meningoencephalitis in a child 7 months of life.
Materials and Methods: The clinical case of cytomegalovirus meningoencephalitis in a child 7 months of life. A complete clinical neurological and instrumental examination.
Results: The child is enrolled with complaints of seizures, impaired consciousness, expressed concern, not eating, increased body temperature. According to complaints pre-

ceded the urinary tract infection – acute pyelonephritis. Neurological status: confusion, lethargy, periodically agitated. Meningeal signs are positive, a bulging fontanelle large. Cranial symptoms: nystagmus, decreased visual reactions, facial nerve paresis. Muscle tone – left-sided hemiparesis. Increased tendon reflexes on the left. Pathological Iambic signs – positive. Hyperkinetic syndrome: tremor, choreoathetosis.
Survey Results: Likvorogramma – Lymphocytic cytosis 80 cells, increased protein and 0.9 g/L. PCR of blood – CMV IgG, IgM positive; EEG – Sleep cortical rhythm is disorganized, recorded epileptiform activity in the anterior leads with periods of bilateral distribution. MRI – a picture of acute encephalitis. In the acute phase was carried out a comprehensive treatment: antiviral (ganciclovir), immunomodulators (Octagam), anticonvulsants (levetiracetam), syndromal, symptomatic therapy. Observation for the next 6 months showed development of severe organic brain damage, the formation of coarse motor defect and resistant forms of symptomatic epilepsy, atrophy of the optic nerve. Repeated MRI – cystic-atrophic transformation of brain.
Conclusions and Discussion: Given a clinical case showed high neurotropic cytomegalovirus, herpes meningoencephalitis malignant course with severe neurological outcomes. Despite the timely diagnosis and adequate complex therapy, the child emerged severe neurological disability.

PP-17.2
Use of video games in Down Syndrome

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Background: Down Syndrome (DS) has unique physical, motor and cognitive characteristics. One option for tasks that uses technological advances are virtual video consoles, used as an intervention in the recovery and development in diverse populations with sensory and motor changes.
Objective: The objective of this study is to verify the occurrence of motor learning in a video game task in individuals with DS.
Design/Methods: Seven individuals participated in the intervention: four females and three males. Task execution consisted of playing a bowling game on a Nintendo Wii video game console. To verify the occurrence of motor learning, 10 attempts were held to throw the bowling ball with the dominant hand in the acquisition stage; five in the retention phase and five in the immediate transfer phase that was accomplished through the release of the ball with the non-dominant hand.
Results: The following are data of the phases evaluated through the mean of each phase: acquisition (7.8), retention (7.9) and transfer (6.7).
Conclusion: The data obtained did not point to learning in the individuals with DS studied, but showed good performance in the task in virtual bowling, as participants managed highly functional results by knocking over an average of 6–10 pins in all phases of the study, even when the task was performed with the non-dominant hand. No learning was observed possibly due to the functional characteristics of the subjects being good enough to allow high scores in all phases evaluated.

PP-17.3
Opportunities in the home environment for motor development from three to 18 months of age and associated factors

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Objective: Evaluate the opportunities presents in the home environment for motor development of Brazilians infants aged between three and 18 months, and it's association with biological, behavioral, demographic and socioeconomic factors.
Background: The interaction with parents, the variability of stimulation and the materials for play are indicators for the quality of environment.
Methods: The study was conducted with 239 infants aged between three and 18 months and the opportunities in home environment was assessed by the Affordance in the Home Environment for Motor Development – Infant Scale (AHEMD-IS). To interpret the data, first proceeded the bivariate analysis with chi-square test, followed by logistic regression analysis.
Results: The opportunities of home environment showed relatively low. For the group aged between three and nine months, it was found association with: birth order (p=0.06), socioeconomic status (p=0.08), monthly (p=0.06) and per-capta (p=0.03) incomes. In logistic regression analysis prevailed the socioeconomic status (RC=7.46; p=0.03). For the group aged from ten to 18 months, the associated factors were: mother's marital status (p<0.01), living with the father (p=0.08), family head (p=0.04), number of people in the household (p=0.05), maternal (p<0.01) and paternal (p<0.01) education, socioeconomic status (p<0.01) and per-capta income (p=0.03). In logistic regression, the mother's marital status (RC=4.83; p=0.02), maternal (RC=0.29; p=0.03) and paternal education (RC=0.33; p=0.04) remained associated.

Conclusions: The stable union, the higher economic status and the greater education of parents seems to be the factors most associated with good opportunities presents in the home environment at this age.

PP-17.13
Early neonatal death due to intracranial haemorrhage: can it be predicted?

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Objective: Approximately three million early neonatal deaths occur annually worldwide, mostly in low-income countries. The most frequent causes are: infections, prematurity and associated conditions, congenital anomalies, birth asphyxia and very low birthweight due to intrauterine growth retardation or prematurity. Many score systems for prediction of neonatal morbidity and mortality use intracranial hemorrhage as indicator because of its high predicting value. Aims of this study are: to present a simple system for prediction of early neonatal death due to intracranial hemorrhage applicable in general hospital; to carry out information which could be base for further programs for improvement of newborn health on local secondary level.
Methods: In this retrospective study, data were collected from medical documentation within the Department of obstetrics and Department of neonatology in Prilep General Hospital.
Results: 50 out of 7956 live born newborns died during the early neonatal period. Twelve per cent of them had intracranial hemorrhage. We estimated relative risk of 54.54 (χ^2=276.97) for the intracranial hemorrhage as a risk factor for the early neonatal death.
Conclusions: We identified the intracranial hemorrhage as a risk factor for early neonatal death which increase the risk 54.54 times. Emphasized attention should be target on interventions which reduce preventable risk factors for early neonatal morbidity and mortality. Identification of the risk factors for early neonatal mortality makes possible the establishment of the preventive programs on local secondary level health care facilities for improving neonatal health.

PP-17.17
Evaluation of lymphocyte subgroups in children with Down Syndrome

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Objective: Children with Down syndrome (DS) have an increased susceptibility to infections and autoimmune disorders. In this study, lymphocyte subgroups including blood CD3, CD4, CD8, CD4/CD8, CD19 and CD16.56 values were analyzed in children with DS. Our aim is to determine whether there was any difference for lymphocyte subgroups between children with DS and healthy children.
Methods: The study includes 85 children with DS, followed at Yüzüncü Yil University, Faculty of Medicine, Department of Pediatrics between December 2004 and May 2008 and 64 healthy age matched control subjects. Blood CD3, CD4, CD8, CD4/CD8, CD19, and CD16.56 values were examined in the study and control groups.
Results: A total of 85 children [48 girls (56%) and 37 boys (44%)], aged 1 month to 131 months (mean 20.91 ± 26.92mo) with DS and 64 healthy children [40 girls (65%) and 24 boys (35%)], aged 1–96 months (mean 23.11 ± 23.40mo) were included in the study. When compared with the control group, significantly decreased blood CD3, CD4, CD19 values were found in the study group (p<0.05). However, there was not any significant difference in CD8, CD4/CD8 and CD16.56 values between the control and study groups (p>0.05).
Conclusions: In conclusion, we would like to emphasize that blood CD3, CD4 and CD19 levels were found to be decreased in children with DS. Based on these finding, we think that these decreased lymphocyte subgroups might be responsible for increased susceptibility to infections in children with DS.

PP-17.20
Acute disseminated encephalomyelitis: a retrospective study in children

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Aim: Acute disseminated encephalomyelitis (ADEM) is an uncommon disease and there are only few series in the literature on ADEM in children. We aimed to investigate retrospectively the clinical, laboratory and radiologic findings of 32 children with ADEM diagnosed and followed at our institution.
Patients and Methods: Acute neurologic abnormalities and imaging evidence of demyelination were required for study inclusion. The age at onset, sex, initial symptoms, presence of previous infectious disease or vaccination, CSF features, magnetic resonance imaging findings (MRI), the type of treatment and the response were recorded.
Results: Male/female ratio was 1.6; mean age at onset was 8.2 years. Fifty-nine per cent had a prior history of infection or vaccination. Most common neurologic findings were speech disturbances, epileptic seizures and tremors. Lumbar punture was done to all patients and CSF examination showed mild pleocytosis in 12% and increased total protein content in 18%. Brain MRI showed more than three lesions in all patients; spinal cord MRI was performed in eight patients (25% %), and two had servical spinal lesions. Steroid therapy alone was used in 81%, intravenous immunoglobulin (IVIG) in 12% and steroid plus IVIG in 7%. The mean follow up period was 19 ± 2 months. The outcomes within 12 months were good (Complete recovery in 50%; minor deficits in 37% and major deficits in 13%) and none of the patient died. ADEM recurred once in two patients (6%).
Conclusion: Our results showed that ADEM is a generally benign condition affecting mainly males, and steroid is the main and effective therapy in children.

PP-17.21
Level of knowledge of child abuse in Malaysia amongst paediatric medical doctors

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Objective: To determine the level of knowledge regarding child abuse and neglect among medical doctors working in the paediatric field in Malaysia and to assess associated factors which contribute to this level of knowledge.
Methods: This is a cross sectional study of medical officers (doctors) working in Department of Paediatrics in major hospitals in Malaysia. By using universal sampling, 106 medical doctors working in 14 major hospitals in different states in Malaysia participated in this study. Data were collected using a pretested questionnaire consisting of 20 questions on knowledge of characteristics of child abuse perpetrators and abused children which were given to the Head of all state hospitals with a paediatric department. The information obtained included personal and demographic data.
Results: The overall paediatric medical officers level of knowledge regarding child abuse and neglect was not as good as expected. Incorrect answers for knowledge of characteristics of child abusers ranged between 0 and 72%, whilst erroneous responses for the knowledge of characteristics of child abused children ranged between 0 and 69.8%. Factors such as age, gender, years of working experience, marital status and previous exposure to child abuse courses did not have any significant effect on the level of knowledge. The only factor which showed a significant effect was any involvement in formal paediatric training programmes.
Conclusions: Child abuse and neglect is a recognised phenomenon leading to developmental disabilities and handicap in children. The ability to detect, address as well as prevent child abuse and neglect, would undoubtedly contribute significantly in preventing avoidable developmental disabilities from affecting children.

PP-17.23
Neurological manifestations in childhood familial Mediterranean fever

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Objective: Familial Mediterranean fever (FMF) is an autosomal recessive hereditary disease which primarily affects non-Ashkenazi Jews, Armenians, Arabs, and Turks. Four common mutations in exon 10 of the MEFV gene seem to account for 86% of the DNA variations identified in patients with FMF. Neurologic involvement in children with FMF is relatively uncommon and rarely described in the pediatric literature. Although headaches occur frequently, meningitis and convulsions are rare. Recently cases with multiple sclerosis (MS) and FMF have been

reported. Recently one case with FMF and PTC has been reported.

Methods: We performed a comprehensive analysis of symptom, diagnostic work-up, therapy, and clinical follow-up in 20 consecutive patients.

Results: Twenty patients with familial Mediterranean fever developed neurologic manifestations. These 13 patients had headaches during acute episodes of the fever. Two patients had convulsions with fever before the age of 6 years; the convulsions and acute episodes recurred at ages 8 and 9 years. Another two patients had described convulsive disorder before the diagnosis of familial Mediterranean fever was made; his convulsions were resistant to antiepileptic drugs alone and subsided only when colchicine was added. Another two patients were described PTC coexisted with FMF. Another one patient was described PTC coexisted with MS.

Conclusions: The possibility of neurologic involvement should be considered in patients with familial Mediterranean fever.

PP-17.24
Concurrent validity among the Perinatal Risk Inventory (PERI), Alberta Infant Motor Scale and motor scale of the Bayley Scales of Infant Development, third edition (BSID-III motor scale) in infants with motor delay

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Objective: To determine the concurrent validity among the PERI, AIMS and BSID-III motor scale.

Methods: Twenty infants have been assessed (10 term/10 preterm) aged between 21 days and 16 months and 24 days. All of the infants were assessed at the same moment in time. Total scores and percentiles in the AIMS were obtained as well as composite and percentile scores corresponding to BSID-III motor scale. Data were analyzed using the SPSS-15.0 and a Pearson correlation coefficient was carried out for each group.

Results: The obtained results show significant correlation coefficients between PERI and AIMS total scores (r=−0.725; p=0.018), in term infants; and in the case of preterm, significant relations were obtained between the PERI correlation coefficient and the composite score of the BSID-III motor scale (r=−0.732; p=0.016), as well as between PERI and BSID–III motor percentile score (r=−0.729; p=0.017) but not with the AIMS. Significant correlations were found also between AIMS percentile score and composite scores (r=0.735; p=0.015) and percentiles (r=0.690; p=0.027) in the BSID-III motor scale.

Conclusions: Results show a strong concurrent validity between PERI and AIMS in the population with motor delay not being preterm; and a high correlation among the three instruments in preterm. These results point out that the use of these instruments may be adequate for the motor development assessment, especially in the case of preterm.

PP-17.26
The impact of family-centered practice on family needs of parents of children with neurodevelopmental disorders

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Objective: To explore whether the extent to which services are family-centered affects the family needs of parents of children with neurodevelopmental disorders.

Methods: 30 parents (27 mothers, three fathers) of children (mean age 7.5 SD 3.63y) diagnosed with cerebral palsy (22 children), spinabifida (5) or other non-progressive neurodevelopmental disorder (3) were included in the study. Families were receiving health services in three out-patient centers in Riga. Parents perception about services provided was evaluated using the Latvian version of MOPC-20. The family needs were estimated using translated and adapted version of Family Needs Survey (Bailey&Simeonsson, 1988). The measure includes 41 items grouped into six areas of needs: Information, Support, Explaining to Others, Community Services, Financial Needs and Family Functioning.

Results: Family-centered processes of care were associated with fewer family needs related to support and community resources (p<0.05), needs for information (p<0.05) and family functioning (p<0.05). There were no association with needs related to finances and explanation to others. In general fewer family needs were recognized in families felt that the services received are family-oriented (p<0.05).

Conclusions: The data supports previous evidence that family – centered services has positive impact on family needs. However due to the small and selected sample, the results need to be interpreted with caution. Future work with larger sample size is planned.

PP-17.27
Diversity of participation in leisure activities: a comparison of school-aged children with and without disabilities measured with the Children's Assessment of Participation and Enjoyment

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Objective: The aim of this study was to compare diversity of participation in leisure activities between children with and without disabilities in Norway.
Background: There is little existing knowledge about participation in leisure activities among children with disabilities in Norway. Based on The Children's Assessment of Participation and Enjoyment (CAPE), comparisons of groups with and without various disabilities have only been conducted in Canada and the Netherlands.
Methods: The study is cross-sectional with 227 participants from 7 to 14 years, 123 with various disabilities and 103 without disabilities completing the CAPE. The CAPE measures participation in 55 leisure activities, divided into five activity types. The diversity dimension describes the variety of the activities the child is engaged in. The Norwegian version is found valid and reliable for children of this age.
Results: The overall number of activities that the children participate in during leisure time is about the same, regardless of having a disability or not, except for two activity types. Children with disabilities participate in significantly fewer physical activities and in more recreational activities than typical peers. Girls and younger children (7–10y) participate more in recreational activities, skill-based activities and self-improvement activities. Children living in urban areas participate less in physical and skill-based activities.
Conclusions: The study reveals some similarities and differences of leisure activity patterns between the Norwegian children with and without disabilities. Children with disabilities in Norway participate in fewer physical activities than children without disabilities. The results underline the need for adaptation of physical activities to fit all.

PP-17.32
Reliability of the Norwegian version of the Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities of Children (PAC)

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Objective: This study examined test-retest reliability of the Norwegian version of Children's Assessment of Participation and Enjoyment (CAPE), and Preferences for Activities of Children (PAC) in children with and without disabilities.
Background: In the process of providing rehabilitation services to children it seems important to assess their preferences and enjoyment towards different activities. The assessment tools CAPE and PAC seem to have the necessary properties to describe preferred activities and how the children like to be involved in them. These instruments have recently been translated into Norwegian; aim of this study is to evaluate the reliability of the translated instrument.
Methods: Totally 141 children, 107 typically developing, mean age 11.1 (SD 2.5), and 34 with disabilities, mean age 14.2 years (SD 2.3) participated in the study. A cross-sectional, test-retest design was applied. The participants completed CAPE and PAC twice within mean 19 days. Test-retest reliability was examined by IntraClass Correlation (ICC), Chronbach?s alpha and Kappa statistics.
Results: The alpha values of internal consistency ranged between 0.53 and 0.87 in CAPE, being satisfactory (>0.70) for 6 of 8 activity types and domains. For PAC, the alpha value of internal consistency ranged between 0.75 and 0.93. The ICC values for CAPE and PAC ranging from 0.49 to 0.83 and 0.50 to 0.85 respectively. The Kappa values ranged from 0.30 to 0.66.
Conclusions: The Norwegian version of the CAPE and PAC demonstrated sufficient measurement properties of internal consistency, relative and absolute test-retest reliability. The reliability of CAPE however, was not entirely satisfactory.

PP-17.33
Examining the swallowing profiles of paediatric patients

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Objective: The aim of this study was to examine the swallowing profiles of pediatric patients who had swallowing difficulties.

Methods: Pediatric patients who had swallowing difficulties were included. Oral, pharyngeal and esophageal swallowing physiologies were examined with videofluoroscopy.
Results: The study included 178 patients with swallowing difficulties whose average age was 37.76+42.54 months. Average height was 82.95+25.1 cm, average weight was 12.32+15.02 kg. 81.5% of the patients were cerebral palsied children, 12.4% had esophageal pathologies, 2.8% were Down's syndrome, 1.7% were Pierre Robin, 1.1% were muscular dystrophy and 0.6% Cat Cry syndrome. As a result of swallowing assessment, 64.2% of patients had oral phase disability, 54% had aspiration, 59.1% had residue and 23.3% had reflux. We suggested nonoral feeding to 52.3% of patients and continuing oral intake to 47.7% of patients. Negative correlation were found between oral phase disability and residue ($p<0.01$) and aspiration ($p<0.01$).
Conclusions: One of the major problems associated with neurological diseases was swallowing disorders. This will be severe as causing aspiration in 54% of patients. So oral phase problems, residue during and after swallowing should be considered as aspiration risk in clinically.

PP-17.38
Agreement on general movements in high-risk preterm infants among four non-blinded observers, without the use of video recording

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Objective: GMs are part of the spontaneous movement repertoire and are present from early fetal life onwards until the end of the first half a year of life. GMs depend on Gestalt perception of observers. GMs may identify infants with neurological deficits in high risk infants. As it is a non-expensive, non-invasive, observation method, it can be easily used in N.I.C.U. General movements (GMs) is based on direct observation of the infant by video recording the spontaneous movement as well as have the oppurtunity to assess with bare eye. This study is planned to investigate the agreement between four observers in preterm general movements with bare eyes, without videorecording.
Methods: Four physiotherapists as observers who were blind to medical records of the infants and each other, assessed the preterm movements of the 76 high risk infants with bare eyes who were hospitalized in N.I.C.U. Mean age of the infants were 31.6 ± 3.2 weeks. All the statistical analyses were made using the SPSS software package. The agreement between four observers were determined by multirater kappa coefficent.
Results: 17 infants were observed by two observers while 27 infants by three observers and 32 infants by 4 observers. Agreement between four observers was 0.3040 ($p<0.001$); for three observers 0.1592 ($p=0.0512$) and for two observers 0.512 ($p=0.001$).
Conclusions: We conclude that clinical decision and assessment with bare eyes are more practical although videorecording and repeated watching of recordings will provide right decision in research studies and follow up process of the infants.

PP-17.4
Home environment and motor development of infants from 3 to 9 months of age

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Objective: To verify the association between the opportunities of home environment and motor development of infants from three to nine months old.
Background: The development is a complex process which may be influenced by several factors. However, there were found few studies about the association between environment and motor development at this age.
Methods: The sample comprised over 92 infants with typical development (46 each sex). Parents answered the questionnaire Affordance in the Home Environment for Motor Development – AHEMD-Infant Scale (AHEMD-IS), while the infants were assessed using the Alberta Infant Motor Scale (AIMS). For statistical analysis, were used non parametric tests: chi-square, Mann–Whitney and Kruskal–Wallis test, considering statistically significant values $p<0.05$ and trends of differentiation lesser than 0.10.
Results: Statistically significant difference was found between the AIMS raw score and the AHEMD-IS Total score ($p=0.018$) and in the 'Play Materials' subscale ($p=0.015$), also, a trend of differentiation in 'Daily Activities' subscale ($p=0.072$) and between the classification of motor development (typical or delayed/atypical) and the classification obtained by AHEMD-IS Total score ($p=0.095$). The interaction between the home environmental opportunities and motor development seems to be influenced by the number of siblings, family and per capta income, explaining the possible links existing in the triad income/family/development.

Conclusions: The results suggest that the opportunities of home environment and motor development are associated in infants between 3 and 9 months old, and that the aspects concerning daily activities and toys seem to exert more influence at this age.

PP-17.45
Videoendoscopy-videofluoroscopy: which one is reliable?

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Objective: The aim of this study was to determine the reliability of the two important techniques (videoendoscopy-videofluoroscopy) in swallowing evaluation.
Methods: 51 pediatric patients who were referred to otolaryngology clinic because of swallowing disabilities were included. Videoendoscopic and videofluoroscopic swallowing assessments were done by two specialist as blind. Three millilitres liquid and puding consistency was used in swallowing assessment. The severity of swallowing disability was rated by the penetration-aspiration scale and residue was evaluated like absent or exist.
Results: The mean age was 34.78 ± 25.48 months. Videoendoscopy and videofluoroscopy results were found similar. There is a significant correlation between the penetration aspiration scores of videoendoscopy and videofluoroscopy both in liquid and pudding consistencies ($p<0.05$). There is also a significant correlation between residue in vallecula and pyriform sinuses ($p<0.05$).
Conclusions: Videofluoroscopy is gold standard in swallowing evaluation. Analysis of the videoendoscopy and videofluoroscopy were determined to be correlated. So more patients can be assessed with easily accessible and applicable method videoendoscopy.

PP-17.46
Detection of copy number variations in patients with structural brain malformations

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Objective: Developmental delay and mental retardation (DD/MR) are heterogeneous group of disorder that is caused by genomic alterations involving many different genes. Strucutural brain disorders like; abnormalities in the tract, comissures white matter usuallly gives rise to DD/MR. Studies for identification of genomic loci contributing to DD/MR revealed several candidate loci that dominantly include subtelomeric regions which are also widely accepted as related to developmental delay/mental retardation (DD/MR). Subtelomeric regions are rich in gene and their rearrangements cannot be identified by conventional chromosome analysis. This study included seventy patients with DD/MR and having visible brain malformations on MRI, in which four families had more than one affected children
Methods: Subtelomeric multiplex ligation-dependent probe amplification (MLPA) and Agilent 60 K array-CGH platform and 105 K Cytosure Syndrome plus array-CGH platform were used to determine the subtelomeric and additional copy number variations (CNVs).
Results: We found a gain for 16p subtelomeric region (SALSA Probe 02720-L00648) in two patients and a gain for 21q subtelomeric region (SALSA probe 02587-L02854) for other two patients. Additionally, duplication of Xp11 detected in two patients by Array CGH.
Conclusions: We believe that fine mapping of aberrations in gene-enriched subtelomeric regions in these patients provides both essential clues for localizing critical regions, and a strategy for identifying new candidate genes.

PP-17.47
A new Turkish case with ataxia-oculomotor apraxia syndrome type 1 diagnosed by whole-exome sequencing

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Objective: Autosomal recessive Ataxia-Ocularmotor Apraxia Syndrome (AOA1) is a clinically well established condition, molecular basis of which has also been well characterized.
Methods: We present here three patients from a large consanguineous family with AOA1 as determined by whole-exome sequencing.
Results: The AOA1 is mainly characterized by early onset ataxic gait, occulomotor apraxia, mental retardation, and a marked atrophy of the cerebellum. The patients suffered from these characteristic features of AOA1, although they did not have hypoalbuminemia and hypercholesterolemia.

Conclusions: These findings suggest the peresence of allelic heterogenity in AOA1. Whole-exome sequencing identified a homozygous preterm stop codon that cosegregated with the phenotype in the pedigreee.

PP-17.49
A first report of TMCO1 defect syndrome in a non-Amish patient

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Objective: In 2010, Xin et al. described a new autosomal recessive syndrome mainly consisting of mental retardation, dysmorphism, skeletal and neurological findings due to a homozygous 2 bp deletion in TMCO1 in a large Old Older Amish family from northeastern Ohio. The authors ruled out other syndromes with similar manifestations and defined this constellation of findings as a new syndrome named it as 'TMCO1 defect syndrome'.
Methods: We describe the 12th patient who was diagnosed with TMCO1 defect syndrome using whole-exome sequencing.
Results: Patient's cranio-facial dysmorphic features consisted of macrocephalic apperance, short neck, low hairline, low set ears, synophrys, hypertelorism, antevert nares, high-arched palate and prognatism. In addition, the patient had hyperextensbile fingers, pectus carinatum, scoliosis and genu varus. Deep tendon reflexes were increased. Whole-exome sequencing identified a preterm stop codon in TMCO1.
Conclusions: These findings extend the occurrence of TMCO1 defect syndrome to other ethnicities and may suggest that this syndrome can be more prevalent than initially observed.

PP-17.53
The evaluation of quality of life and cognitive functions of epilepsy patients on monotherapy

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Objective: In this study the effect of antiepileptic drugs on the quality of life and cognitive functions of epilepsy patients on monotherapy is investigated.
Methods: The study includes 101 lately diagnosed epilepsy patients, between 6 and 16 years old, literate, not sight, hearing or speech impaired, and without any chronic diseases. The patients are started on valproic acid, carbamazepine, oxcarbazepine or levetiracetam. WISC-R and Quality of Life Questionnaire are applied on patients three times: before taking antiepileptic drugs, 6 months and 12 months after starting antiepileptic drugs. Patients whose seizures could not be controlled by a single antiepileptic drug are excluded from the study.
Results: The verbal, performance, and total intelligence points of the patients on monotherapy are compared at the beginning of the treatment, at the 6th and 12th months and no significant difference is observed between the drugs. Attention/memory and quality of life points are higher at the 6th month than they were at the beginning of the treatment. However, there is no significant difference between the results at 12th month and 6th month or at 12th month and the beginning of the treatment.
Conclusions: There is no significant difference amongst the average verbal, performance and total intelligence, quality of life, and attention/memory points of the patients who are on a single antiepileptic drug (valproic acid, carbamazepine, oxcarbazepine, or levetiracetam) at the begining, 6th months and 12th months. It is determined that the type of antiepileptic drug has no negative effects on cognitive functions and the quality of life.

PP-17.60
An investigation of functional performance and health-related quality of life in children with hearing loss

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Objective: The aim of this study was to investigate the activities of daily living and health related quality of life (HRQoL) among children with hearing loss and their healthy peers.
Methods: 55 children (mean age: 6.26±0.712y) with hearing loss and their healthy peers were included in the study. After taking sociodemographic information, the Pediatric Evaluation of Disability Inventory (PEDI) was used for assessing the functional performance in the activities of daily living and the child Health Questionnaire Parent Form (CHQ-PF50) was used to asses health related quality of life (HRQoL).

Results: The children with hearing loss had lower scores from both tests. There were statistically significant difference in self care, mobility and social function domains of PEDİ ($p<0.05$). There were also statistically significant differences in favour of healthy peers in global health ($p=0.00$), physical function ($p=0.002$), global health perceptions ($p=0.00$), physical role/social limitations ($p=0.00$), emotional role/social limitations ($p=0.00$), behaviors ($p=0.00$), global general health ($p=0.00$) and mental health ($p=0.00$) except bodily pain/discomfort ($p=0.509$).
Conclusions: The results of this study showed that, children with hearing loss are more dependent in the activities of daily living. Furthermore the children with hearing loss showed the most marked decrease in quality of life, especially concerning psychosocial health and social limitations. Therefore, the quality of life and functional performance should be evaluate as detailed in children with hearing loss and rehabilitation programme must be planned to increase social participation.

PP-17.66
Functional results of decompression of posterior interosseous nerve in obstetrical brachial plexus palsy: preliminary report

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Objective: Posterior interosseous nerve (PIN) palsy can be seen in children with upper trunk obstetrical brachial plexus palsy. Radial head superior displacement due to shortening of biceps brachii and pronator teres muscles and size reduction of supinator muscle due to denervation fibrosis can be causative factors. Surgery is implemented when conservative approaches fail. The aim of this study is to determine the functional effect of PIN decompression surgery in children with upper trunk OBPP.
Methods: Nine children with upper trunk OBPP (mean age 31±15.9 mo) were included to the study. Wrist extension was assessed with Active Movement Scale. Supinator muscle was released to decompress the PIN. A radial palsy splint was used after suture removal for 3 months. Regular home exercise program was continued before and after surgery. Wilcoxon test and Pearson Correlation test were used for statistical analysis.
Results: Mean timing of surgery was 20 ± 17 months of age. Mean follow up time was 11 ± 4 months. There was no statistical difference in wrist extension after PIN decompression ($p=0.083$). Additionally, timing of surgery did not affect the functional results ($r=0.337$, $p=0.375$).
Conclusions: Based on our limited cases, functional results of PIN decompression in OBBP are not satisfactory. Owing to negative effect on grip and hand function, drop wrist is an important problem. Keeping the elastic properties of supinator muscle and keeping the radial head in anatomical position must be preferential in physiotherapy and rehabilitation. In resistive cases, tendon transfer for wrist and finger extension may be implemented in addition to PIN decompression.

PP-17.68
Professionals' work and children's participation in pediatric rehabilitation

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Objective: The main objective is to achieve knowledge about how professionals interact and communicate with children in consultations.
Methods: This is a qualitative case study exploring a consultation in a pediatric habilitation unit where professionals, parents and a boy participate. Participant observation is performed. Analytical focus is on the role of toys and equipment in understanding the child's participation, and to what extent this is being paid attention to in the consultation. Perspectives from interactional role theory and theory concerned with materiality and objects is used as analytical framework.
Results: Analysis illuminates how the child's participation appears in the back ground when focusing on the face to face interaction and the conversation. Analysis of how the boy uses the toys and equipment in the room reveals the child's participation, which in the end is decisive for the professional's conclusion. The participants in the consultation have different understanding of what happens in the consultation. The analysis also reveals the absence of investigating what the boy means when he defines his own competence.
Conclusions: The study shows the complexity of a consultation. Understanding of the child's participation is very much dependent on choice of focus. The child's competence can be seen in play with toys and equipment. The child's own understanding of competence can give the child a greater participating role in the consultation.

PP-17.70
Short-term functional outcome of contralateral C7 transfer in patients with obstetrical brachial plexus injury

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Objective: Contralateral C7 (CC7) transfer is the most frequently used method in restoring limb function in case of nerve root avulsion or total palsy in obstetrical brachial plexus palsy (OBPP). The aim of this study is to evaluate the short-term functional recovery after CC7 transfer.
Methods: A retrospective review of 11 patients with total root avulsion injuries who had undergone CC7 transfer by a single surgeon during 2-years period was conducted. The CC7 nerve root was transferred to the lower trunk, axillar and musculocutaneous nerve of the affected side. The mean follow-up period was 24.5 months with a minimum 18 months. The results of the active movement scale (AMS), Gilbert assessment (GA) and sensory grading were reviewed in all patients.
Results: There was no impairment of donor limb function. Improvement in motor and sensory function was observed in all patients. Seven patients achieved 3 or greater AMS score and 3 GA score of shoulder abduction. Six patients reached 3 or greater AMS score and 2 GA score of elbow flexion. Four patients developed 1 or greater GA score of hand function. In all cases, sensory function of the hand observed from 8 months postoperatively.
Conclusions: The short-term results of the CC7 transfer showed that such a reconstruction can be a good option for the recovery of motor function of the shoulder and sensory function of the hand in a shorter period. Besides, absence of donor site motor/sensory deficits and mirror hand movements are the advantages of the technique.

PP-17.75
Peer problems mediate the relationship between developmental coordination disorder and behavioral problems in school-aged children

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Objective: The aim of this study was to gain insights into the relationship between developmental coordination disorder, peer problems and behavioral (internalizing and externalizing) problems in school-aged children. Based on the contextual paradigm (Lerner, 1998) we assumed that the relationship between developmental coordination disorder and internalizing/externalizing problems in school-aged children is mediated by peer problems. We tested the hypothesis that a greater degree of motor impairment causes a greater degree of peer problems and thus a greater degree of internalizing or externalizing problems.
Methods: Seventy boys and girls aged between 5 and 11 years were examined using the Movement Assessment Battery for Children 2 and the Intelligence and Developmental Scales.
Results: The results of path analysis (χ^2=0.530; df=1; p=.467; RMSEA=0.000 [0.000; 0.284]; CFI=1.000) showed that the relationship between developmental coordination disorder and internalizing/externalizing problems in school-aged children is mediated at least in part by peer problems. However, the cross-sectional design does not allow for identifying the cause-effect relationship between motor impairment, peer problems and internalizing/externalizing problems in school-aged children.
Conclusions: Programs aimed at promoting motor development may not only be important for an improved ability to perform daily activities, but may also be directly and indirectly relevant for the development of the child's peer-relations and behavior.
Reference: Lerner RM. Theories of human development: contemporary perspectives. In: RM Lerner (ed), Handbook of Child Development. Vol. 1: Theoretical Models of Human Development (pp. 1–24). New York: John Wiley & Sons, 1998.