EFFECT AND EXPERIENCE OF A DYNAMIC SEATING SURFACE ON POSTURAL CONTROL AND FUNCTION IN CHILDREN AND YOUTH WITH CEREBRAL PALSY – Experiences Gained and Lessons Learned; Using SPCM, Pressure Mapping and Videography

Background
Developing seating systems for disabled persons is of great importance as they can be used to increase levels of postural control and function which will have an impact on daily activities and participation. This study takes its start point in a seat back and base made of a dynamic material and analyzing changes in postural control. It is part of research collaboration in Northern Denmark with support of the European Regional Development Fund.

Purpose
To investigate if a new dynamic seating surface improves postural control and function in youths and children with cerebral palsy and the consequences of adapting the Seated Postural Control Measure. Additional to identify how this seat / back system were experienced by users and therapists

Participants
10 children, age 10-16; additional 2 young persons, age 20 and 3 therapists

Methods
In this study two seating systems were compared on children age 10-16; a dynamic seating system versus various traditional seating systems.
Outcome measures used were the Seated Postural Control Measure, modified to meet the participants needs (MSPCM) measured alignment and function. Force Sensitive Applications (FSA) measured postural movements and interface pressure. Test sequences were video-recorded simultaneously from different angles, analyzed and scored later with computer software goniometry (Kinovea). Qualitative observation of head and trunk control were made and documented.
Additional 5 qualitative semi-structured interview of 30 minutes were conducted. A questionnaire guide with five themes were used; design, comfort, balance,perspective and the prototype itself. All interviews were conducted after the test period carried inspired by Giorgi's modified analysis (Malterud, 2003). Data were categorized into key points for each theme. From these were developed artificial quotes, with the aim to collect and crystallize the essence of the responses in a quote.

Results
No significant statistical results were gained from the quantitative methods used; MSPCM and FSA though there was slight increase in mean pressure distribution. The subjective observations showed no clear trend. The interview showed that the sitting surface feels rather hard and the lack of supporting systems makes them feel unsecure. On the other hand it gave them som challenges in a more active sitting position. Further development should be as an activity chair to persons with CP - GMF level I, II (III).

Conclusion
SPCM is described as being able to compare seating systems. Experiences in modifying the measuring tool, use of videography, body markers and computer software goniometry for scoring presented various challenges, giving rise to questions about SPCM, the seating system tested and the relevance of experience and training. The study comprises important areas of interest, especially in the adaptive seating systems, and future studies using videography.
Additional important information has been obtained from users and therapists for the continued development of the seating system towards a functional activity chair.

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Keywords: Postural Control and Function, Seating system, Cerebral Palsy, SPCM, Videography

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