Jag tackar härmed för bidraget från Börje Gabrielssons Minnesfond för att föreläsa vid GCMACs precourse vid årsmötetet för AACPDM (American Academy for Cerebral Palsy and Developmental Medicine) i Montreal Sept 13-16 2017.

GCMAC (Gait and Clinical Movement Analysis Society) ansvarede för en pre-course om utvärdering av rörelser i övre extremitet hos barn med cerebral pares, då jag dels berättade om ett sätt att mäta muskelstyvhet vid CP, dels om hur man med accelerometrar kan mäta användandet av armarna i dagliga livet, som en utvärdering av behandling. För abstract och program, se nedan. Det var ca 50 deltagare av olika professioner, som alla behandlar övre extremitet hos barn med cerebral pares.

Eva Pontén

GCMAS Symposium AACPDM Preliminary Program
Quantitative techniques for assessment of upper extremity movement dysfunction

Authors/Presenters: *Susan Duff, OT, PT, EdD, Kathleen Friel, PhD, Lanie Gutierrez Farewik, PhD, Ellen Jaspers, PT, PhD, Cristina Simone-Martinez, PT, MSc , Eva Pontén, MD, PhD, Jean Stout, PT, MS, Aviva Wolff, OT, EdD*

Contact Information:
Susan V. Duff, OT, PT, EdD. Chapman University, Irvine, CA, USA. duff@chapman.edu
Kathleen Friel, PhD. Burke Institute, White Plains, NY, USA. Kaf3001@med.cornell.edu
Lanie Gutierrez-Farewik, PhD. KTH, Stockholm, Sweden. lanie@mech.kth.se
Ellen Jaspers, PT, PhD. ETH, Zurich, Switzerland. Ellen.jaspers@hest.ethz.ch
Cristina Simone-Martinez, PT, MSc. KU Leuven, Belgium. Cristina.simon@kuleuven.be
Eva Ponten, MD, PhD. Karolinska Institute, Stockholm, Sweden. Eva.ponten@ki.se
Jean Stout, PT, MS. Gillete Childrens, St. Paul, MN, USA. jstout@gillettechildrens.com
Aviva Wolff, OT, EdD. Hospital for Special Surgery, NY, USA. wolffa@hss.edu

Course Level: Beginner, intermediate and advanced.

Purpose: The aim of this symposium is to present a framework for quantitative assessment and measurement of upper extremity (UE) movement and coordination. We will describe clinical and scientific application of a range of quantitative techniques useful to assess change in UE performance over time and following intervention. We will present new research findings and discuss how these measures can inform clinicians and researchers about UE function.

Target Audience: Clinicians (physicians, occupational therapists, physical therapists), engineers, biomechanists, kinesiologists, and scientists who treat, assess, study and/or measure upper extremity movement disorders in children and youth with cerebral palsy and other conditions will benefit from this symposium. Prior experience analyzing and interpreting motion analysis data is beneficial, but not required.

Learning Objectives:
At the end of the symposium participants will be able to:
1. Discuss the various methods used to collect motion data and how it can be used to describe and assess UE motion and function.
2. Identify indications for motion analysis of hand and arm function in clinical practice.
3. Read and interpret basic graphs representing kinematic and muscle function data.
4. Identify indications for cortical measures of hand and arm function in clinical practice.

Course Summary:

The course will focus on measures used clinically and scientifically to assess function and the effects of interventions. A review and description of a wide range of techniques for the assessment of movement dysfunction will be presented. Topics covered in this symposium will include clinical assessment tools, standardized outcome measures, kinematic and biomechanical models, methods to assess muscle stiffness and activity, and neuro-imaging techniques that are used to measure cortical activity and changes in hand and arm function. Clinical applications will be discussed with case presentations to illustrate use and interpretation of data.

The following primary topics will be covered:

1. **Introductions and objectives** (5 min) – *Aviva Wolff*

2. **Overview** (15 min) – *Aviva Wolff*

    a. Framework for assessment of UE movement dysfunction
        i. Clinical assessments, activity monitoring, kinematics and biomechanics, muscle function, , functional activities, cortical activity
    b. Challenges, limitations, opportunities

3. **UE activity monitoring and motion analysis with inertial sensors** (30 min) *Susan Duff, Eva Ponten*

    a. Monitoring UE activity in children with cerebral palsy and perinatal brachial plexus palsy *(Duff, Ponten)*
    b. Assessment of UE interlimb coordination *(Duff)*

4. **Kinematics and biomechanical analysis of UE movement** (50 min) *Lanie Gutierrez-Farewik, Ellen Jaspers*, *Cristina Simon-Martinez*

Objective UE assessment in unilateral CP: from measurement to interpretation

a. Novel “cloud” method for three-dimensional (3D) analysis *(Gutierrez-Farewik)*
b. Methods for 3D upper extremity motion analysis during gait and functional activities (*Jaspers*)
c. Clinically available data analysis tools (ULEMA, AMP, SPM1d-analysis) (*Jasper, Simon-Martinez*)
d. Case presentations of results and interpretation of data (*Simon-Martinez*)

5. **Panel discussion/Q and A** (20 min) - *Wolff, Ponten, Duff, Jaspers, Martinez, Gutierrez-Farewik*

BREAK – 20 minutes

6. **Muscle stiffness and function** (50 min) – *Jean Stout, Eva Ponten, Aviva Wolff*

    a. Use of Video and EMG to assess candidacy for tendon transfer surgery (*Stout*)
    b. Measurement of stiffness of wrist and finger flexors (*Ponten)*
    c. Shearwave ultrasound elastography to assess stiffness pre and post botox injection in the elbow and wrist (*Wolff)*

7. **Cortical measures of hand function** (30 min) – *Kathleen Friel*

    a. Use of neuroimaging techniques to visualize and measure brain connections important for hand function – Diffusion tensor imaging (DTI) and transcranial magnetic stimulation (TMS)
    b. Clinical applications of new research findings

8. **Panel discussion/Q and A (20 min)** – *Wolff, Ponten, Stout, Friel*