The success of networking –
hip surveillance model for better care
of patients with Cerebral Palsy in Germany

Gunnar Hägglund, MD, PhD
Department of Orthopaedics
University Hospital
Lund, Sweden
GMFCS V

MP = 55%

HSA = 185°
"Dislocation of the hip in cerebral palsy is preventable"

M.O. Tachdjian 1956
Follow-up program for cerebral palsy

1994
Prevent hip dislocation

Prevent contractures
Deformity
Clinical examination PT and OT

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<th>GMFCS</th>
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- Examination once a year
- Examination twice a year
## Radiographic schedule - hips

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- **Examination once a year**
- **Individually based examination**
CPUP vs Australien

CPUP

I
II
III
IV
V

Australien

I
II
III
IV
V

100%

162%
Problem!

Watch out

OK
> 40
33-40
< 33
Early experiences

- Improved collaboration
- Detection of hip displacements
- Early detection of contractures
10-year follow-up
The natural history of hip dislocation in cerebral palsy

About 15% of the total population of children with CP would develop hip dislocation
Prevention of dislocation of the hip in children with cerebral palsy

The first ten years of a population-based prevention programme

G. Hägglund,
S. Andersson,
H. Düppe,
H. Lauge-Pedersen,
E. Nordmark,
L. Westbom

20-year follow-up
Before CPUP
Born 1990-91
N = 87

Hip dislocation
N = 9 (10%)

CPUP
Born 1992-2007
N = 689

Hip dislocation
N = 2 (0.3%)
Preventive surgery among 689 children

Adductor-psoas release
N = 55

Femoral varus osteotomy
N = 25

Femoral varus osteotomy
N = 36

N = 10

N = 5
Preventive surgery related to age and GMFCS

GMFCS V
GMFCS IV
GMFCS III
GMFCS I - II

Age
Surgical prevention of hip dislocation

Adductor – psoas release

- When?
- What muscles?
- Tenotomy or lengthening?

Femoral osteotomy

- When?
- What degree?
- Shortening?
- Derotation?
- Uni- or bilateral?

Pelvic osteotomy

- When?
- How?
Risk factors for hip displacement:

Gross Motor Function (GMFCS)

Characteristics of children with hip displacement in cerebral palsy
Gunnar Hägglund*1, Henrik Lauge-Pedersen1 and Philippe Wagner2

BMC Musculoskeletal Disorders 2007, 8:101
Risk factors for hip displacement:

Charactersitics of children with hip displacement in cerebral palsy
Gunnar Hägglund*1, Henrik Lauge-Pedersen1 and Philippe Wagner2

BMC Musculoskeletal Disorders 2007, 8:101
Risk factors for hip displacement:

Migration Percentage \( (a/D \times 100) \)
Risk factors for hip displacement:

Head-shaft angle
Head-shaft angle is a risk factor for hip displacement in children with cerebral palsy

Maria HERMANSON¹, Gunnar HÄGGLUND¹, Jacques RIAD², and Philippe WAGNER¹

¹ Department of Clinical Science, Orthopedic Surgery, Skåne University Hospital, Lund; ² Department of Orthopedic Surgery, Skaraborgs Hospital, Skövde, Sweden.
Correspondence: maria.hermanson@hotmail.com
Prediction of hip displacement in children with cerebral palsy

DEVELOPMENT OF THE CPUP HIP SCORE

Bone Joint J 2015;97-B:1441-4

GMFCS

Age

MP

HSA
AUC = 0.87
GMFCS    IV
HSA      170
MP       34
Age      6

Risk 10 - 20%
GMFCS  V
HSA      170
MP       34
Age      6

Risk 50 - 60%
GMFCS: V
HSA: 170
MP: 34
Age: 6

Risk 50 - 60%
GMFCS V
HSA 180
MP 34
Age 6

Risk 70-80%
GMFCS    V
HSA      180
MP      34
Age     3

Risk 90-100%
N = 7500 + 600 new cases/year
Challenges and obstacles

General
Country-specific
• Identify all individuals with CP
Identify all individuals
Prevalence 2.4 / 1000

Cerebral palsy in a total population of 4–11 year olds in southern Sweden. Prevalence and distribution according to different CP classification systems
Lena Westbom*1,4, Gunnar Hagglund2,4 and Eva Nordmark3,4

BMC Pediatrics 2007, 7:41

Cerebral palsy in southern Sweden
I. Prevalence and clinical features
E Nordmark1, G Hägglund2 and J Lagergren3
Departments of Physical Therapy1, Orthopaedics2 and Paediatrics3, Lund University

Acta Paediatrica 2007; 90: 1271-1276
• Identify all individuals with CP

• Hip radiograph from an early age
Hip displacement - age

Characteristics of children with hip displacement in cerebral palsy
Gunnar Hägglund*1, Henrik Lauge-Pedersen1 and Philippe Wagner2

BMC Musculoskeletal Disorders 2007, 8:101
- Identify all individuals with CP
- Hip radiograph from an early age
- Fast-track to treatment
The natural history of hip development in cerebral palsy

TERJE TERJESEN

Department of Orthopaedic Surgery, Oslo University Hospital, Rikshospitalet and University of Oslo, Oslo, Norway.

Correspondence to Dr Terje Terjesen at Department of Orthopaedic Surgery, Oslo University Hospital, Rikshospitalet and University of Oslo, NO-0027 Oslo, Norway. E-mail: terje.terjesen@riksospitalet.no

This article is commented on by Rutz on page 878 of this issue.

335 children
12 hip dislocations = 4%
”Long waiting list for op”
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<tr>
<th></th>
<th>Norway</th>
<th>Sweden</th>
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<tbody>
<tr>
<td>Prevalence CP</td>
<td>2.65/1000</td>
<td>2.7/1000</td>
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<tr>
<td>GMFCS III-V</td>
<td>34%</td>
<td>38%</td>
</tr>
<tr>
<td>Hip dislocation</td>
<td>15%</td>
<td>1%</td>
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<tr>
<td>Hip surgery</td>
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<tr>
<td>Tenotomy</td>
<td>24%</td>
<td>12%</td>
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<tr>
<td>Femur osteotony</td>
<td>9%</td>
<td>15%</td>
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<tr>
<td>Pelvic osteotony</td>
<td>9%</td>
<td>4%</td>
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<tr>
<td>Salvage surgery</td>
<td>3%</td>
<td>0%</td>
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BMC Musculoskeletal Disorders 2011:12:284
Age at first hip operation

- Patients hip operated (Sweden)
- Patients hip operated (Norway)
• Identify all individuals with CP
• Hip radiograph from an early age
• Fast-track to treatment
• Consensus and collaboration
Reports of individual data
Challenges and obstacles

General
Country-specific
Challenges and obstacles

Country-specific:
- Economy – funding
- Health care organisation
- Laws and regulations
Hip surveillance in cerebral palsy