Rehabilitation following SDR

- Some centers do no inpatient work
- Some centers do six weeks of inpatient therapy or more
- Many centers do somewhere in between

Varying Rehabilitation Approaches

<table>
<thead>
<tr>
<th>Institution</th>
<th>Inpatient</th>
<th>Outpatient Episode (12 months)</th>
<th>Pre-Op Other Treatments</th>
<th>Other Basis</th>
<th>Surgery</th>
<th>Post-Sent</th>
<th>Additional Modalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gillette Children's, St. Paul, MN</td>
<td>3 weeks</td>
<td>2-3 weeks</td>
<td>Orthopedic</td>
<td>Physical</td>
<td>Yes</td>
<td>Pre-Op</td>
<td>Physical, Speech</td>
</tr>
<tr>
<td>Chicago Children, IL</td>
<td>2 weeks</td>
<td>2 weeks</td>
<td>Orthopedic</td>
<td>Physical</td>
<td>Yes</td>
<td>Pre-Op</td>
<td>Physical, Speech</td>
</tr>
<tr>
<td>Children's Mercy, Kansas City</td>
<td>2 weeks</td>
<td>2 weeks</td>
<td>Orthopedic</td>
<td>Physical</td>
<td>Yes</td>
<td>Pre-Op</td>
<td>Physical, Speech</td>
</tr>
<tr>
<td>Mayo Clinic, Rochester, MN</td>
<td>3 weeks</td>
<td>2 weeks</td>
<td>Orthopedic</td>
<td>Physical</td>
<td>Yes</td>
<td>Pre-Op</td>
<td>Physical, Speech</td>
</tr>
<tr>
<td>Seattle Children's, WA</td>
<td>2 weeks</td>
<td>2 weeks</td>
<td>Orthopedic</td>
<td>Physical</td>
<td>Yes</td>
<td>Pre-Op</td>
<td>Physical, Speech</td>
</tr>
</tbody>
</table>
Goals of Rehabilitation

- ROM
- Strengthening
- Sitting
- Mobility/weight shifting
- Reciprocal Movement
- Balance
- Motor control

- Ankle/Feet preparation for stance phase of gait
- Pre-ambulation
- AFO selection
- Transition work
- Endurance
- Speed

ROM

- Hip extension
  - Prone lying time
  - Prone stander/mobile stander

- Knee extension
  - Prone lying time
  - Prone stander/mobile stander
  - K's

- Dorsiflexion
  - Prone stander/mobile stander
  - AFO's
IC 14 - A MULTIDISCIPLINARY APPROACH TO IMPROVING GAIT IN CHILDREN WITH CEREBRAL PALSY WITH RHIZOTOMY: PATIENT SELECTION, AND OUTCOMES

Strengthening

- Certainly leg strengthening
- Don’t forget the arms!
  - OT daily
- Core muscle strengthening

Sitting

- Side sitting
- Long sitting
- Tailor sitting
- Transitions
IC 14 - A MULTIDISCIPLINARY APPROACH TO IMPROVING GAIT IN CHILDREN WITH CEREBRAL PALSY WITH RHIZOTOMY: PATIENT SELECTION, AND OUTCOMES

Mobility and Weight shifting

Pre-ambulation
IC 14 - A MULTIDISCIPLINARY APPROACH TO IMPROVING GAIT IN CHILDREN WITH CEREBRAL PALSY WITH RHIZOTOMY: PATIENT SELECTION, AND OUTCOMES

**AFO Selection**

- Solid AFO to rigid PLS
  - Support the patient in stance
  - Maintain ROM
  - Reduce crouch

**Endurance**
Outpatient Therapy

- At discharge, outpatient therapy remains imperative:
  - 5 days/week × ~1 month – accomplished typically between the school team and the outpatient therapy team
  - Decreased dosing of PT is approved as the child demonstrates solid and retained improvement in ambulation goals
  - Many children continue with 2-3 days/week at 6 months

- The child returns for PT evaluations at Gillette approximately 6 and 12 months postoperatively

Outcomes of Spasticity Reduction for Children with Cerebral Palsy

Maximizing Efficacy
Minimizing Risk
Tom F Novacheck, MD
Gillette Children’s Specialty Healthcare
Director, Center for Gait and Motion Analysis
Outcome

Trost JP, Schwartz MH, Krach LE, Dunn MB, Novacheck TF:
Comprehensive short-term outcome assessment of selective dorsal rhizotomy,

Study Design

- Retrospective Analysis
- Subjects
  - Gait analysis 0-18 months prior to SDR
  - Gait analysis 8-36 months subsequent to SDR
  - SDR performed at 1994 - 2003
    - Gillette Children's Specialty Healthcare, or
    - Shriners Hospital for Children – Twin Cities Unit
Outcome Measures

- Gillette Gait Index
  - Overall measure of gait pathology

- Gillette Functional Assessment Questionnaire
  - 10 level walking scale

- Oxygen Cost
  - Net nondimensional cost

- Ashworth Score
  - Sum of specific muscles

Subjects

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Age</th>
<th>Follow-Up Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>55</td>
<td>76</td>
<td>2.1</td>
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<tr>
<td>Female</td>
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<td>69</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>136</td>
<td>72</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Age and Follow-Up Time in Years
IC 14 - A MULTIDISCIPLINARY APPROACH TO IMPROVING GAIT IN CHILDREN WITH CEREBRAL PALSY WITH RHIZOTOMY: PATIENT SELECTION, AND OUTCOMES

**GMFCS**

- IV (7)
- I (6)
- III (59)
- II (64)

**Outcome Categories**

- **Lost**
  - Pre: within typical range, Post: outside typical range
- **Worsened**
  - Pre: outside typical range, Post: further outside typical range
- **Neutral**
  - **Unchanged**
    - Pre: outside typical range, Post: outside typical range, no further/closer to typical (within exp. Error)
  - **Maintained**
    - Pre: within typical range, Post: within typical range
- **Improved**
  - Pre: outside typical range, Post: outside typical range, but closer to typical
- **Corrected**
  - Pre: outside typical range, Post: within typical range

September 2017 AACPDM 71st Annual Meeting, Montreal, Quebec, Canada
Gait Changes: Pelvis

Pre

Gait Changes: Hip

Pre