An Evidence-Based Review of Physical Therapy Intervention for Individuals Who Have Undergone a Selective Dorsal Rhizotomy

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Objectives

• Describe current practice in physical therapy (PT) management of patients following SDR (selective dorsal rhizotomy)
• Identify evidence-based recommendations for clinical assessments before and after SDR
• Select evidence-based therapeutic interventions and dosing related to PT before and after SDR
• Discuss future research needs related to PT following SDR
Disclosure Information
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Speaker Name: Caroline Colvin, PT, DPT, PCS and Molly Thomas, PT, DPT, PCS

Disclosure of Relevant Financial Relationships
We have no financial relationships to disclose.

Disclosure of Off-Label and/or investigative uses:
We will not discuss off label use and/or investigational use in this presentation.
Why are we all here?

• Are SDRs performed at your institution?
• Are you using a standard protocol for post-SDR PT?
• How long do you follow patients who’ve undergone SDR?
• Is there consistency with patient selection?
• Is a PT providing input when patients are recommended for SDR?
Why is this important?

Increase in SDRs, with no common PT protocol globally:
- Dosing (frequency, intensity, timing, and type)
- Assessments (pre-op and post-op)
- Outcomes measures
- Goal setting
- Family and patient education
SDR at a glance

• Historical perspective
  ➢ Palpation vs intra-operative monitoring
  ➢ Multi-level (conus) vs single-level (cauda equina) laminectomy

• Goals of SDR:
  ➢ permanent reduction of spasticity
  ➢ improvements in motor function
  ➢ prevent progression of orthopaedic impairments
What is evidenced-based practice?
Finding the Current Evidence

• **Goal**: to examine evidence related to PT intervention and assessment for individuals who have undergone a SDR.

• **Key words**: selective +/- dorsal +/- rhizotomy, cerebral palsy, diplegia, spasticity, physical therapy, rehabilitation, strengthening, cerebral palsy, spastic cerebral palsy, exercise

• **Databases**: PEDro, CINAHL, Medline/Ovid, Cochrane

• **Years Searched**: 2000-2018
### Finding the Current Evidence, continued

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Number</th>
<th>Author (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic Review</td>
<td>1</td>
<td>Grunt (2013)</td>
</tr>
<tr>
<td>Meta-Analysis</td>
<td>1</td>
<td>McLaughlin (2002)</td>
</tr>
<tr>
<td>Randomized Clinical Trial</td>
<td>2</td>
<td>Graubert (2000); Steinbok (2002)</td>
</tr>
<tr>
<td>Cohort-Retrospective</td>
<td>2</td>
<td>Dudley (2013); Romei (2018)</td>
</tr>
<tr>
<td>Literature Review</td>
<td>1</td>
<td>Nicolini-Panisson (2017)</td>
</tr>
<tr>
<td>Case Report</td>
<td>2</td>
<td>Al-Shaar (2016); van Shie (2005)</td>
</tr>
<tr>
<td>Published Expert Opinion</td>
<td>3</td>
<td>Cawker (2016); Roberts (2015); Vermeulen (2015)</td>
</tr>
</tbody>
</table>
Assessments: using the International Classification of Functioning, Disability, and Health (ICF) Model

• Body Structures and Function
  – Modified Ashworth Scale (MAS)
  – Range of motion
  – Strength testing
  – Selectivity assessment
  – Pain
Assessments: using the ICF Model, continued

• Activity
  – Gross Motor Function Measure (GMFM): 88, 66, no mention of Item Sets
  – Walk tests: 1 minute walk test
  – Gait analysis: 3D or observational (Observational Gait Scale or Edinburgh Visual Gait Score), Physiological Cost Index
  – Peabody Fine Motor Scale (PDMS-2): but gross motor could be considered
Assessments: using the ICF Model, continued

• Participation
  – Pediatric Evaluation of Disability Inventory (PEDI):
    • Self-care and mobility domains
    • Functional skills and caregiver’s assistance dimensions
  – Canadian Occupational Performance Measure (COPM)
## Current Practices

<table>
<thead>
<tr>
<th>ICU/ IP stay</th>
<th>IP Rehab</th>
<th>OP therapies</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-7 days</td>
<td>1-6 weeks</td>
<td>9-24 months</td>
</tr>
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</table>
Dosing/FITT

- **Frequency:**
  - Pre-op intensive
  - Up to 3-5 times per week initially and then tapered down to 1 time per week
- **Intensity:** not discussed
- **Timing:**
  - Overwhelmingly supports initiation of PT within 1 week of SDR
  - Variation between 9-24 months of direct PT following SDR
Dosing/FITT, continued

• Type:
  – Strengthening
  – Stretching
  – Bed mobility
  – Transfers
  – Gait training
  – Postural training
  – Balance training
  – Equipment and orthoses
Further Research Needs

- Dosing
- Assessment battery
- PT protocol
- Selection criteria

- Good news…we are collaborating with Amy Schulz, DPT and Heather Forst, OTR/L at Gillette Children’s Specialty Healthcare on an APTA sponsored Clinical Practice Guideline for SDR care.
Questions

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References

References


