**DP41: Clinical Use of 0-10 NRS as a Patient-Reported Spasticity Measure**

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**Introduction**

- Patient-reported outcomes are increasingly important in rehabilitation & medicine
- The NIH formulated the PROMIS measures to understand the patient perspective of injury or illness1
  - For children under the age of 17, a proxy measure is also utilized1
- Though PROMIS measures are available for pain & global health, there is no specific measure for spasticity
- The Numeric Rating Scale (NRS) is a self-reported survey indicating the perceived level of spasticity on a scale of 0 to 10, where 0 is no spasticity and 10 is the worst possible spasticity2

**Objective of Study**

- This case report illustrates the way in which PROMIS & the NRS can be used to understand the experience of spasticity or muscle tone, and track improvement in tightness, range of motion, and ankle biomechanics while undergoing a robotic ankle stretching protocol
- Children enrolled in the Intelligent Stretching (IS) Program were recruited since known improvements occur with this routine3,4
  - Both the child and parent (proxy) completed the NRS at each of the visits
  - The NRS was compared to the MAS and Tardieu Scale measures taken at the same time
  - Measures were taken throughout the 6-week stretching program

**Case Discussion**

- 16-year-old male with right hemiplegia due to perinatal left MCA stroke
- Has received Botox injections, to ankle flexors for tone, but last injections > 3 years ago
  - Noting increased tone due to recent growth spurt

<table>
<thead>
<tr>
<th>Measure</th>
<th>Before IS Program</th>
<th>After IS Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>R2 w/knee flexed</td>
<td>+10°</td>
<td>+12°</td>
</tr>
<tr>
<td>R2 w/knee extended</td>
<td>+5°</td>
<td>+7°</td>
</tr>
<tr>
<td>R1</td>
<td>-10°</td>
<td>0°</td>
</tr>
<tr>
<td>NRS</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>NRS (Proxy)</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

**Intelligent Stretcher**

- IS Program:
  - 10 minutes passive stretch → 20 minutes active movement training
  - 3 sessions/week over 6 weeks (total 18 sessions)
  - Feedback using audiovisual games and robotic boot
- PROMIS Pain Interference Instrument4:
  - Measures self-reported consequences of pain on the life of the patient

**Numeric Rating Scale (NRS)**

Circle how much tightness/spasticity you had today.

- No spasticity/ tightness
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- Worst possible spasticity/tightness

**Conclusion**

- Consideration should be given to the patient’s experience of muscle tone and spasticity
- Using the PROMIS & NRS questionnaires allows clinicians to understand how the patient perceives their pain and tone
- Further work needs to be done in correlating the NRS and PROMIS measures with outcomes
- Limitations include cognitive impairment in some of the Cerebral Palsy population, restricting reliability of self-reported measures

**PROMIS Pediatric Pain Interference**

<table>
<thead>
<tr>
<th>Item</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>I had to stay home due to pain when I had pain</td>
<td></td>
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<tr>
<td>I had to have someone stay with me when I had pain</td>
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<tr>
<td>I avoided physical activity due to pain</td>
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**References**