Physiotherapists’ use of evaluation measures to guide decisions about ankle-foot orthoses for children with cerebral palsy

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This data has been published in: Kane, K.J., Lanovaz, J.L., & Musselman, K.E. (2018). Physical therapists’ use of evaluation measures to inform the prescription of ankle-foot orthoses for children with cerebral palsy. \textit{Phys Occup Ther Ped}
Introduction

- PTs play a key role in deciding which AFO design will optimize a child’s mobility & monitoring effectiveness
- Evaluation is necessary for individualized AFO prescription & successful orthotic intervention (Kane et al., 2018)
- Understanding current orthotic evaluation practices may contribute to more consistent, effective clinical practices
- Therefore the aim of this survey study was to examine:
  1) What is evaluated and how (initially & post-fitting)?
  2) How does evaluation inform prescription & adjustments?
  3) Recommendations to improve prescription?

Methods

Participants: PTs working with children with CP in Canada

Online survey
- Created by researchers & 5 content experts
- 28 questions examined
  - Types of AFOs & indications
  - Plantarflexed ankle angle in the AFO (AA-AFO): indications, perceived benefits & harms
  - How evaluation informs AFO type, AA-AFO, adjustments

Analysis
- Closed-ended questions: descriptive statistics
- Open-ended responses: 3 researchers conducted a conventional content analysis to establish themes (Hsieh & Shannon, 2005)
Results

- 60 PTs from 10 provinces completed the survey
  - ~ 50% from ON and BC; 89% publicly-funded
  - Median 10y pediatric experience (<1y-42 y)
  - Access to orthotists: 52% on-site; 37% >1km away

Theme 1. Focus on impairment-level measures

- Gait was primarily evaluated by non-standardized observation; more objective tools (e.g., goniometer) used to assess tone & ROM
- AA-AFO was influenced by ankle ROM and tone (R1 or “first catch”/R2 or “end range”)
- AFO type was influenced by ankle DF ROM and PF tone (R1/R2), strength, alignment, gross motor function, gait pattern
- Most follow-up adjustments aimed to improve comfort/fit
  - <20% of adjustments aimed to improve gait pattern

Theme 2. Lack of confidence/ knowledge

- Median confidence in AFO decisions = 57.5 (0=not confident; 100=++confident)
- AA-AFO: Uncertain about whether PF may help or harm
  - “It’s a big grey area and each child is different.”
- AFO type: Most confident about indications for solid & hinged, but inconsistent & nonspecific
  - Less familiar with ground reaction AFOs, energy storage and return (ESR) AFOs, posterior leaf spring, & carbon fiber AFOs

Theme 3. Inconsistent practices between PTs

- Interpretation of findings and decision-making varied
  - Decisions about AA-AFO: Plantarflexion may “impair” OR “improve” gait quality
  - Decisions about AFO type: “prefer hinged AFOs for all ambulatory children” OR “default to solid unless there is optimal range, strength, and bony alignment”

- Inconsistent interpretation of indications for different AFO types e.g., How much ROM is needed to use a hinged AFO?
  - “Some active dorsiflexion”
  - “Neutral”
  - “Adequate ROM”
  - “>10°”
  - “Enough range past neutral to tolerate a hinged AFO”
Most important constructs to assess

- ROM
- Gait pattern
- Muscle tone
- Goals
- Muscle strength
- Function/GM skills
- Bony alignment of foot/leg
- Shank kinematics in gait
- Comfort/fit
- Leg length
- Participation
- Parent/child satisfaction/preference
- Endurance
- Spatiotemporal (e.g., speed)

% of respondents
Recommendations for practice and research

Use objective measures
- Objectively document goals & outcomes
- Use measures like the COPM, GAS, EVGS & video
- Identify and develop outcome measures for AFOs

Prioritize participation
- Use standardized measures
- Set participation goals; ↓ focus on impairments
- Study effects of AFOs on participation

Increase consistency of PT practises
- Integrate current evidence in practice
- Education about orthotic/tuning literature
- Study effects of different AFO types and aspects of the prescription
- Develop evidence-based best practice guidelines

Address biomechanical goals in follow-up
- Support PT-orthotist collaboration
- Increase knowledge of AFO-footwear combination tuning
- Optimize AFO-footwear combination biomechanics to address goals
- Evaluate efficacy of tuning and effects on activity/participation

Conclusions
- Non-standardized, observational evaluation methods and impairment-level constructs appear to guide AFO prescription decisions
- Inconsistent practices may reflect efforts to individualize prescriptions, or may reflect the paucity of evidence-based clinical guidelines
- Best practice guidelines and standardized tools to assess meaningful outcomes may improve clinician confidence, consistency, and outcomes

COPM: Canadian Occupational Performance Measure (Law et al., 1994); GAS: Goal Attainment Scaling; EVGS: Edinburgh Visual Gait Score (Read et al., 2003)