# Global inter-rater reliability of the Post-stroke Spasticity Referral Tool

Jorg Wissel, MD, FRCP<sup>1</sup>; Atul Patel, MD, MHSA<sup>2</sup>; Gerard E. Francisco, MD<sup>3</sup>; Ganesh Bavikatte, MBBS, MD, FRCP<sup>4</sup>; Xiao Li, PhD<sup>5</sup>; Nabilah Alibhai<sup>6</sup>; Elizabeth Tucker, BMSC, CCRP, PMP<sup>6</sup>

- 1. Vivantes Hospital Spandeau, Berlin, Germany
- 2. Kansas City Bone & Joint Clinic, Overland Park, KS, USA
- 3. University of Texas McGovern Medical School at Houston, Houston, TX, USA
  - 4. The Walton Centre NHS Trust, Liverpool, UK
    - 5. AbbVie, Chicago, IL, USA
    - 6. AbbVie, Irvine, CA, USA

#### **Background and aims**

Early identification and treatment of post-stroke spasticity (PSS) are critical for improving patients' functional ability and quality of life after a stroke. The PSS Referral Tool was developed to facilitate early identification and referral of patients with PSS by clinicians involved in stroke rehabilitation. An inter-rater reliability study was performed to validate the utility of the tool in clinical practice.

#### **Methods**

This prospective study was conducted in 3 phases: phase A, production of standardized patient clinical assessment videos; phase B, classification of selected videos into referral categories (Urgent Referral, Routine Referral, and Periodic Monitoring) by a PSS expert panel; and phase C, recruitment of clinicians to classify patients' referral needs using the PSS Referral Tool after viewing the videos (**Figure 1**). Clinician participants, including physical therapists, noninjecting physiatrists, and neurologists, were recruited from 6 global regions (Australia, South America, North America, European Union [EU], Nordics, United Kingdom [UK]) and oriented to the PSS Referral Tool before use. For each referral category, 5 patient videos were viewed and rated by the clinicians. Inter-rater reliability was estimated by calculating the intraclass correlation coefficient (ICC) among assessments from all raters using a 2-way random effect, absolute agreement, single-measurement model. ICC values range from 0.0 to 1.0, with higher numbers indicating better reliability.

### Results

Fifty clinician participants were recruited in total (Australia, 30%; EU, 32%; North America, 8%; Nordics, 6%; UK, 24%); 70% had no previous experience with the PSS Referral Tool. The ICC for all ratings by clinicians was 0.68 (95% CI: 0.53, 0.84). The percentages of correct ratings for Urgent Referral, Routine Referral, and Periodic Monitoring videos were 69.2% (173/250), 69.2% (173/250), and 88.0% (220/250), respectively (**Figure 2**). The proportion of patient videos classified correctly by a majority of clinicians was 14/15 among clinicians with no PSS Referral Tool experience and 13/15 among clinicians with experience (93.3% and 86.7% sensitivity, respectively).

#### Conclusion

The PSS Referral Tool can help accurately identify and triage patients at risk for PSS who require referral, even when used by clinicians who have no previous experience with the tool.

Figure 1. Study design

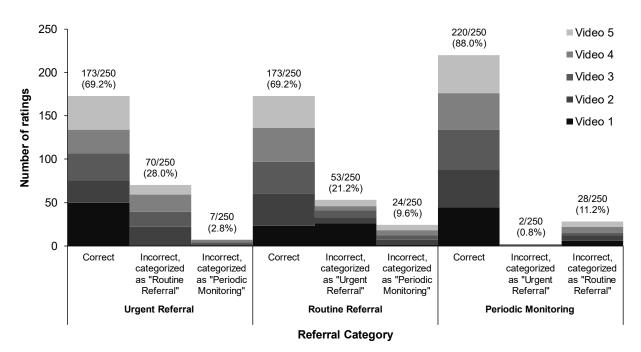
## Part A: Production of patient videos

## Part B: Expert consensus review and virtual platform build

## Part C: Clinician recruitment and participation

- Clinic sites recruit post-stroke patients to be video recorded
- Site investigators perform clinic assessments and capture information necessary to classify patients into 1 of 3 referral categories
- · Up to 30 videos are recorded
- PSS expert panel classifies patient videos using the PSS Referral Tool and agrees on 5 videos per referral category to be used in part C
- Consensus is required from at least 3 of 4 experts for a video to be used
- Virtual platform for clinician recruitment and participation is built and tested
- Clinician participants use the PSS Referral Tool virtually to classify patients (3 sessions, ~30 min each, 5 videos per session)
- Agreement among clinician participant ratings is used to evaluate inter-rater reliability
- Agreement between clinician participant ratings and expert panel classifications is used to determine sensitivity

Figure 2. PSS Referral Tool risk classification accuracy\*



\*A total of 15 patient videos were reviewed and rated (5 per referral category).