Development of a Hand Assessment for Multiple Sclerosis (HAMS)

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Background

Impaired hand function (1,2,3,4) in MS includes:

- deficits in grip strength, coordination, and sensation.
- difficulties with daily activities such as work, meal preparation, and dressing.
- affecting ability to participate in occupations of productivity and leisure, and impact one's independence and quality of life (5,6).

The Need

- ☐ A priority is to support people to engage in meaningful chosen occupations.
- ☐ *There is currently no MS-specific performance-based hand assessment.*
- ☐ A specific, sensitive assessment will aid in tailoring interventions appropriately.

Research Questions

1. *What would a hand assessment include for use in MS?*

2. *Does this hand assessment have clinical utility & content validity?*

Research Design

This study involved the following phases (Figure 1):

1. **Assessment development**

2. **Consultation**

3. **Manual use & tool administration**

4. **Analysis**

Figure 1. Sequence of Phases
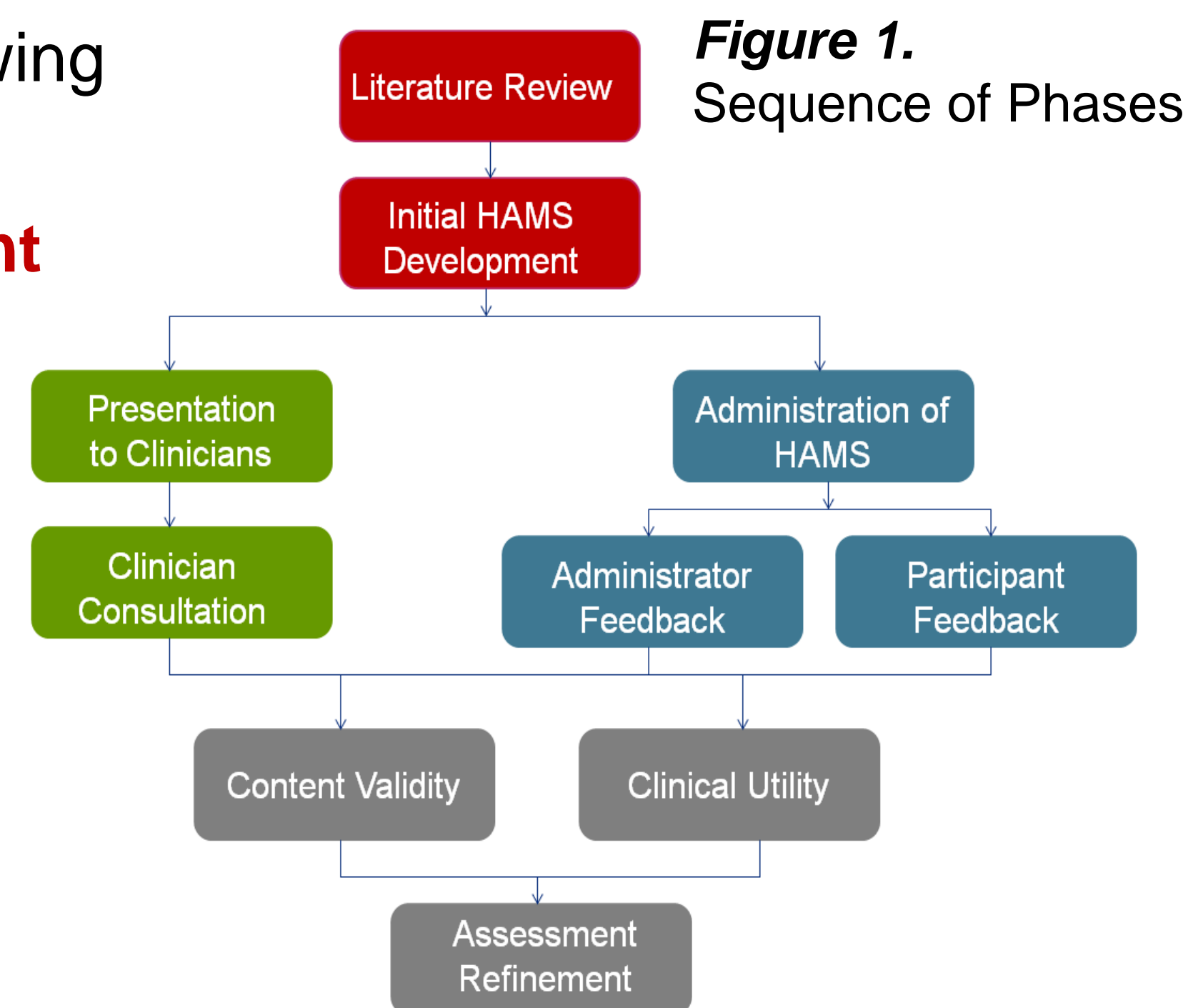
Development of the HAMS

1. **Assessment Development**
   - Literature review using CINAHL, Medline, Embase, Google Scholar to:
     - identify hand deficits in MS & methods of functional hand assessment.
     …. Based on this, the 1st version of the HAMS was developed.

2. **Consultation Phase**
   - Recruited occupational therapists at an information session & snowball.
   - Feedback gained through an anonymized survey. Example of questions:
     - *Does the HAMS capture sensation, coordination and vibration?*
     - *Is the assessment easy to follow and organized logically?*
     - *Was the administration, equipment & assessment flow appropriate*

3. **Administration Phase**
   - Recruited persons with MS to do a HAMS evaluation & provide feedback.
   - Feedback gained through an anonymized survey. Example of questions:
     - *Does the HAMS accurately measure what it is intended to?*
     - *Are the HAMSdirections easy to understand?*

4. **Analysis**
   Upon analyzing clinical utility & content validity data - HAMS was refined.

Results

Research question #1: What does the HAMS include? (Figures 2 & 3)

- Focus is on the activities that persons with MS want to engage in through the use of their hands.
- 5 components: 1 self response; 1 interview; 2 physical assessment; 1 summary & recommendations.
- Physical Assessment includes observation (wounds, atrophy, redness, swelling, contracture, involuntary movement), strength, sensation, coordination, and vibration.
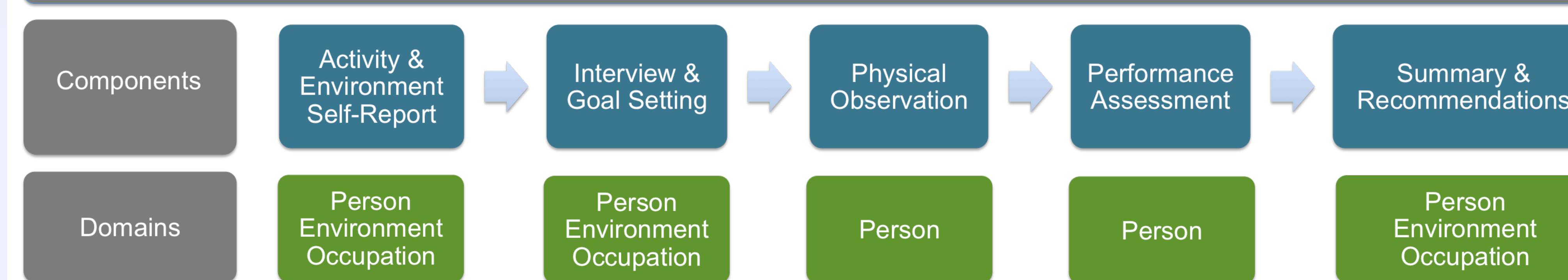
Figure 2. Hand Assessment for Multiple Sclerosis (HAMS)

Figure 3. Equipment
- Dynamometer
- Pinch gauge
- 9-Hole Peg Test
- Stereognosis kit
- Semmes-Weinstein Monofilaments
- Tuning fork

Research question #2: Evaluating clinical utility and content validity
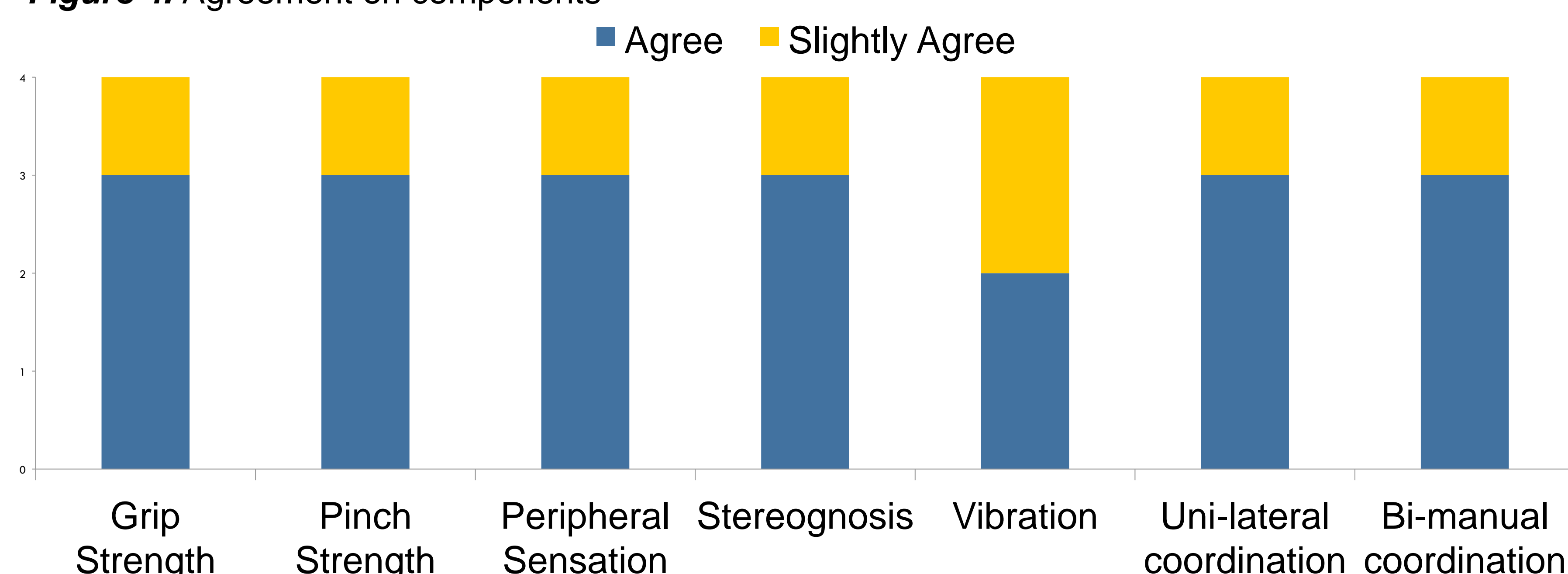### Participant group: Occupational Therapists (OTs)

CLINICAL UTILITY:
OTs agreed that the HAMS:
- equipment was appropriate (Figure 3)
- was feasible to administer in 60 minutes.

CONTENT VALIDITY:
OTs agreed that the HAMS:
- captured information about performance components (Figure 4)

Participants also suggested the activities of driving, putting on/off jewelry, and tying shoes be added to the Self-Report Questionnaire.

Characteristics of OTs	n
Consenting	5
Completing Survey	4
Gender	
Female	4
Male	0
Yrs of Experience (avg)	21
Practice Setting	
Rehabilitation	2
Neuromuscular	1
Outpatient	1

Figure 4. Agreement on components

Legend: ■ Agree ■ Slightly Agree

Categories: Grip Strength, Pinch Strength, Peripheral Sensation, Stereognosis, Vibration, Uni-lateral coordination, Bi-manual coordination

Research question #2 (continued):

Participant: Person with MS

Participant Characteristics
- Female with Relapsing Remitting MS (1989).

CLINICAL UTILITY:

The participant agreed that the HAMS:

- questionnaire was easy to understand and fill out.
- results would help a therapist plan her treatment.
- administration time was appropriate.

Participant noted that she experienced some hand fatigue at the end of the assessment.

CONTENT VALIDITY:

The participant agreed that the HAMS:

- questionnaire captured the activities where she experiences difficulties with her hands.
- allowed her to set goals that were accurate and specific to what she wanted to work on and reflected her strengths and difficulties.

Future Steps

- Continued recruitment of participants with MS.
- Refine HAMS based on participant feedback.
- Based on present results:
  - the Self-Report Questionnaire will include additional activities.
  - the Administration Handbook will be refined to increase clarity.
- An instructional video will be created.
- Evaluation of HAMS reliability and validity clinicometrics.

References

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Acknowledgements