

# Development of the HealthMeasures Facioscapulohumeral Muscular Dystrophy-32 (HM FSHD-32) Patient-Reported Outcome Measure

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## Background

- Facioscapulohumeral muscular dystrophy (FSHD) is a serious, rare, progressive, and disabling muscle wasting disease that impacts the face, shoulders, arms, trunk, and legs.
- There are no approved treatments for FSHD, but there are several in clinical trials.
- Current FSHD-specific patient-reported outcome measures (PROMs) can be lengthy, burdensome, and insensitive to change.

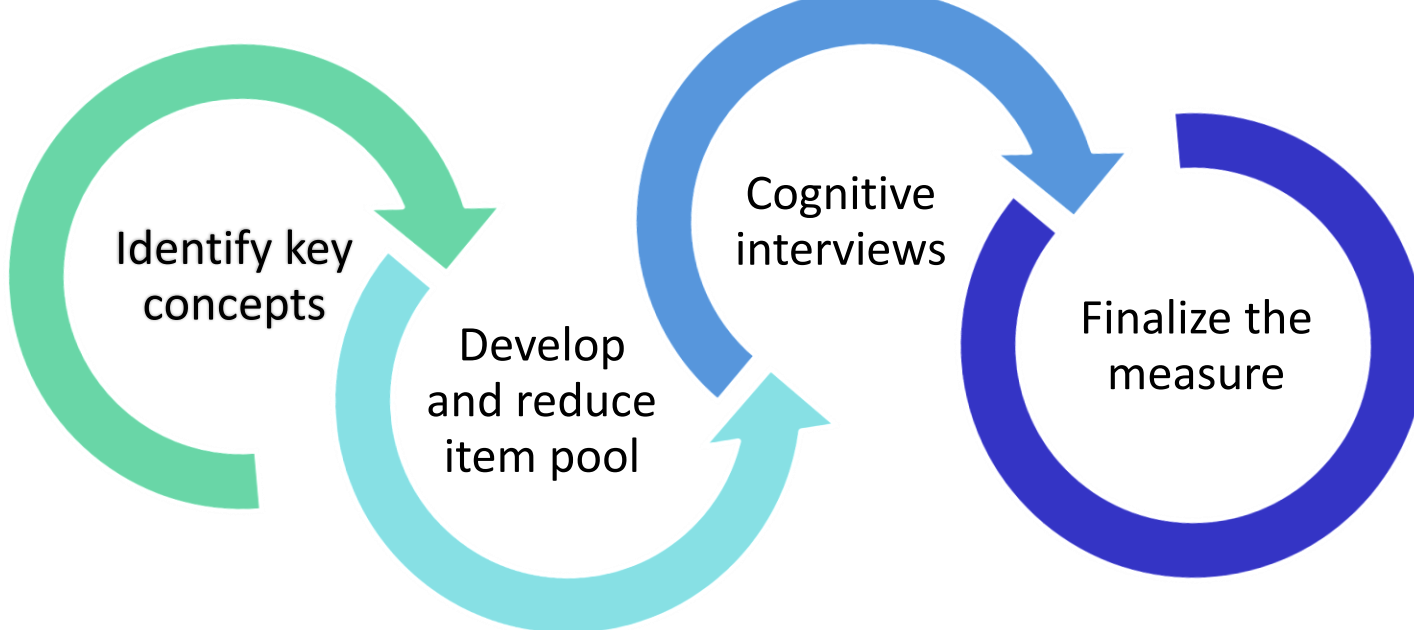
## Objective

- To develop an FSHD PROM of physical function (PF) and symptoms that reduces response burden and may be more responsive than available instruments.

## Methods

Measure development involved four phases: 1) identification of key concepts; 2) item pool development; 3) cognitive interviews; and 4) translatability review to finalize the measure.

Figure 1. Measure Development Process



### Phase 1. Identification of Key Concepts

- We reviewed key literature, data from a previous qualitative study on FSHD PF limitations (N=5; UG3 FD006794-01) and longitudinal data (N=80) from a Fulcrum Therapeutics' ReDUX4 Phase 2 Clinical Trial (item-level score correlations between the 116-item FSHD-Health Index and Patient Global Impression of Change) to identify priority limitations and symptoms that are sensitive to change over one-year.
- Findings were compiled and reviewed to prioritize concepts for potential inclusion. Concepts were prioritized as high, medium, and low (e.g., High: ≥60% interview participants, strong literature support based on prevalence and importance, and concept may or may not have been sensitive to change on FSHD-HI).

### Phase 2. Item Pool Development and Reduction

- High and medium priority concepts were mapped to existing items from the Patient Reported Outcomes Measurement Information System (PROMIS<sup>®</sup>), Quality of Life in Neurological Disorders (Neuro-QoL<sup>™</sup>), the Functional Assessment of Chronic Illness Therapy (FACIT), and new items were drafted as needed.
- The item pool was reduced via input from experts in measure development, clinicians, and researchers with FSHD experience.

### Phase 3. Cognitive Interviews

- Cognitive interviews of the draft measure were conducted with persons with FSHD to evaluate item comprehension, relevance, and clarity.
- Interviews and analysis conducted iteratively whereby problematic items were identified, removed, revised, or new items were added for evaluation in subsequent interviews.

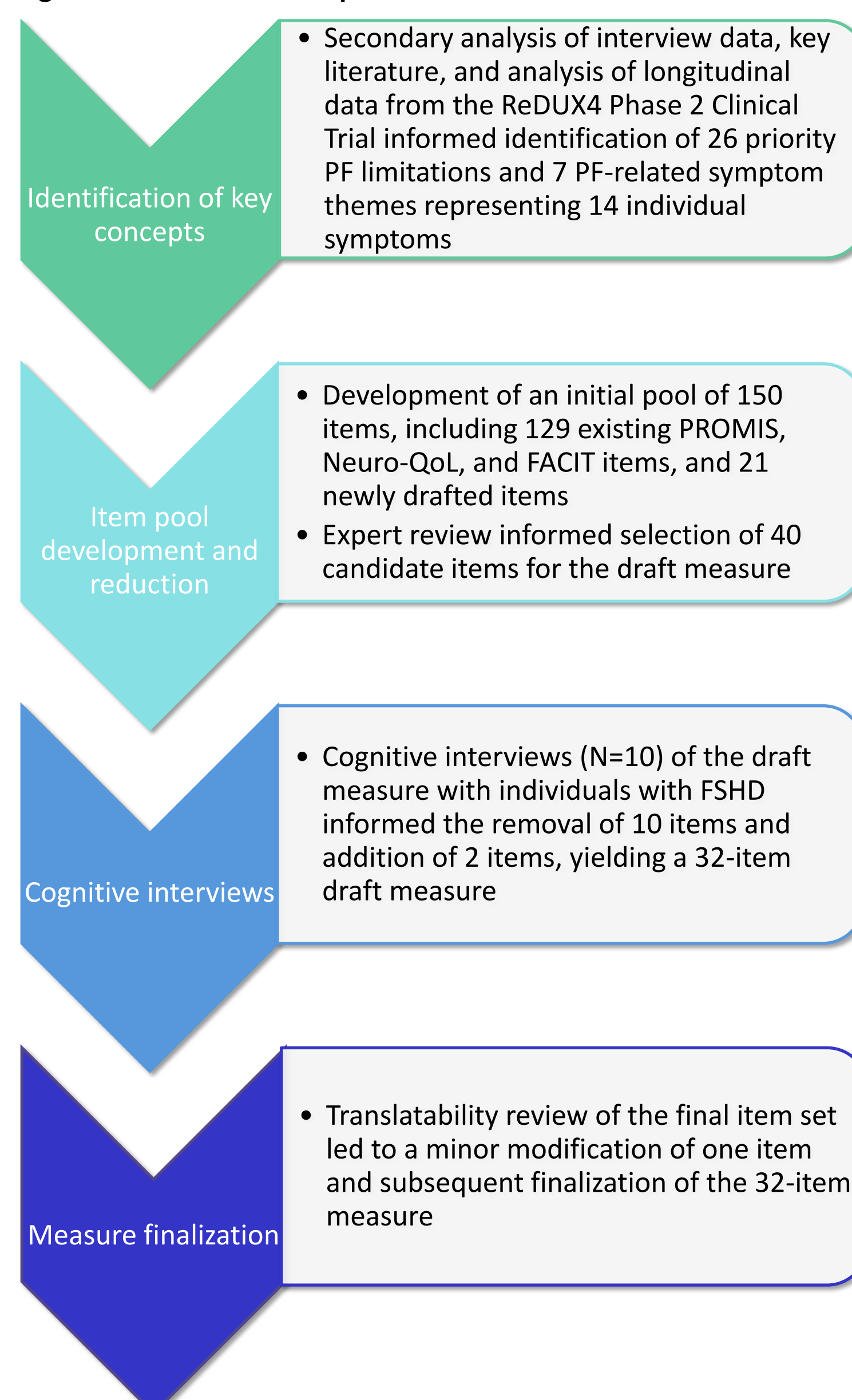
### Phase 4. Measure Finalization

- The draft measure underwent translatability assessment to identify conceptual or linguistic issues that could impede translation or cross-cultural research.
- If problematic text was identified, the reviewer recommended deletion or suggested alternate wording. The measure was revised as needed.

Table 1. Priority PF and Symptom Concepts by Domain

<b>Mobility</b>
Walking
Balance
Climbing stairs
Getting into or out of bed/ Getting up from a lying position
Running/jogging
Standing
Walking on uneven surfaces
Sports
<b>Upper Extremity/Dexterity</b>
Raising arms above shoulders/reaching overhead
Grasping/holding objects
Lifting arms/items (e.g., glass to mouth)
Fine motor (e.g., twisting, squeezing, typing)
Using utensils
Bringing hands(s) to mouth/face/head
<b>Instrumental and Activities of Daily Living (I/ADLs)</b>
Fixing one's hair
Carrying groceries or heavy objects
Taking off clothing/ getting dressed
Heavy household chores (e.g., vacuuming, mopping)
Light household chores (e.g., dusting, doing dishes)
Carrying laundry/laundry basket
<b>Central/Axial Function</b>
Standing from a seated position
Pushing an object
Picking up objects from the floor
<b>Facial Function</b>
Communication/mouth movement
Facial expressions
Smiling
<b>PF-Related Symptoms of FSHD</b>
Pain
Fatigue
Upper extremity range of motion
Upper extremity weakness
Core weakness
Lower extremity weakness
Facial weakness

Figure 2. Measure Development Results Overview



## Results

- Table 1 illustrates the priority PF limitations and symptoms identified from phase 1 of the development process.
- An overview of results from each phase of measure development is shown in Figure 2.
- Ten cognitive interviews were conducted with participants diagnosed with FSHD to refine the measure. The average age of participants was 58 (38-73), most (n=6, 60%) were male, all (100%) identified as White and on average participants were diagnosed 39.2 (range 16-64) years prior.
- **Findings of this study informed development of the HealthMeasures Facioscapulohumeral Muscular Dystrophy-32 (HM FSHD-32) which contains 32 items and three scales:**
  - Physical Function Scale (PFS)
    - 17 items from PROMIS (13 items) and Neuro-QoL (4 items)
      - E.g., *Are you able to stand unsupported for 10 minutes?*
  - Symptoms and Limitations Scale (SLS)
    - 11 items from FACIT (4 items) and 7 new items that assess concepts not covered by existing HM item banks (e.g., foot drop, leg weakness, shoulder weakness, range of motion)
      - E.g., *I have limited range of movement in my arms*
  - Facial Function Scale (FFS)
    - 4 new items that assess concepts not covered by HM item banks (e.g., verbal communication, facial expressions, smiling, facial weakness)
      - E.g., *Are you able to show facial expressions?*
    - Can be administered or removed to tailor the measure to the FSHD population under investigation

## Conclusions

- Findings of this study resulted in the identification of 26 priority PF limitations and 14 PF-related symptoms that are important to individuals with FSHD and may be sensitive to change.
- The HM FSHD-32 reflects what we believe to be the most important PF limitations and symptoms that have been shown to be responsive to change in a format less burdensome to persons with FSHD (32 vs. 116 items).
- The measure can be tailored to the FSHD population under investigation by administering or removing the facial function scale depending on the study aims and population.
- The HM FSHD-32 is being utilized as an exploratory endpoint in Fulcrum Therapeutics' Phase 3 REACH clinical trial
- Future work will involve psychometric validation in a diverse sample.

## Acknowledgements

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