Phase 1:
5 Key Domains of Motor Function Were Identified
- Locomotion
- Strength
- Endurance
- Non-Vestibular Balance
- Dexterity

Candidate Measures:
- Horse Race Between 5 Iterations of Pegboards
  - 9-Hole Pegboard
  - 25-Hole Pegboard (Lafayette)
  - Grooved 25-Hole Pegboard
- Validation Measures
  - Purdue Pegboard (adults)
  - Bruinicks Osteretsky – dexterity scale (pediatrics)
Dexterity

Preliminary Findings
- Pre-tested with convenience sample of adults (n=18)
- Leading Candidate – Grooved 25-hole pegboard
  - Greater task demands for precise peg placement
  - Allows greater discrimination in general population
  - Longer, therefore, more forgiving of participation "errors" – such as dropped pegs
  - Qualitatively – participants report preference for the feel of metal pegs
- Other innovation
  - Video instructions for consistent test administration
  - Computer-based data capture with online timer

Strength

Candidate Measures
- Grip strength dynamometer: Jamar PlusDigital
- Electronic Manual Muscle Testing
  - Shoulder Flexion
  - Elbow Extension/Flexion
  - Hip Flexion
  - Knee Extension
- Timed Chair Rise
- Validation Measures
  - Biodes (adults)
  - Brumicks-Oseretsky Muscle strength scale (pediatrics)

Preliminary Findings
- Pre-tested for feasibility in adult convenience sample (n=18)
- Leading candidate (Upper Extremity Strength): Grip strength dynamometry
  - Easy to administer
  - Reliable and normed for much of the population
- Electronic manual muscle testing
  - Elbow flexion/extension and hip flexion/extension leading candidates
  - Easy of administration
  - Ability of administrators to apply adequate and reliable counter pressure
**Strength (cont'd)**

**Preliminary Findings**
- Timed chair rise
  - Shows adequate discrimination
  - Not a pure measure of strength (combines strength, balance and agility without a reliable means of determining the individual contributions of each)

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**Locomotion**

**Candidate Measures**
- 20 ft walk
- 20 ft walk (out and back)
- 4 m walk
- Metric: Time to walk set distance
- Pace: as quickly as possible
- Pre-testing Plan: Test feasibility with convenience sample (21-65, 75-85) (n=36)
- Status: IRB pending

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**Endurance**

**Candidate Measures**
- 6 minute walk test (100' course) – criterion standard
- 6 minute walk test (50' course) – distance recorded at 2 minute intervals
- 2 minute walk test (50' course)
- Metric: Distance walk in set amount of time
- Pace: as quickly as possible (rest breaks as needed, timer does not stop)
- Pre-testing Plan: Test feasibility with convenience sample (n=36)
- Status: IRB pending
Non-Vestibular Balance

- Vestibular and non-vestibular balance are reunited by a single measure
- Modified Computerized Test of Sensory Integrative Balance under the direction of Dr. Susan Whitney

Validation Plan Criteria for Inclusion

- Entire domain validated as a unit at 3 sites (n=450 across the age span)
- Evaluate test-retest and inter-rater reliability (≥.80)
- Evaluate ability to discriminate (significant beyond .01 level)
- Evaluate equivalence to criterion standard (correlation .70 or greater)
- Evaluate order & interaction effects across sub-domains
- Evaluate and avoid ‘floor’ and ‘ceiling’ effects
- Determine safety and fatigue cut points (for individual measures and domain as a whole)

Motor Domain

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Motor

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October 27th, 2008