Relationship Among Measures of Self-Efficacy, Participation, Physical Function, & Real World Physical Activity in Chronic Stroke

Background Information

Definitions

- PROMIS® = Patient- Reported Outcomes Measurement Information System. PROMIS® is a set of person-centered measures that evaluates and monitors physical, mental, and social health through both computer adaptive testing and traditional "paper and pencil" instruments.
- Chronic Stroke = onset ≥ 3 months
- Active Time = upright time (total standing time + total stepping time) + cycling time
- Sedentary time = sitting time + seated transport time + primary lying time + secondary lying time
- Activity Index = active time / sedentary time

What We Know

Self- efficacy is a key determinant of behavior, exercise participation, and "real world" physical activity. (Ellis, 2011; Schmid, 2012)

Treatments targeting self-efficacy can improve activity in patients with chronic stroke. (Danks, 2016; Pang, 2007)

Current measures of self-efficacy (patient reported):
-Pen and paper: ABC, FES-I
-CAT/Short form: PROMIS® (Managing Daily Activities)

Research Question

Do PROMIS® measures correlate significantly enough with traditional measures of self-efficacy, physical performance, and real-world physical activity in a chronic stroke population to justify replacing their use in clinic?

Hypothesis

PROMIS® measures will demonstrate significant correlations with a variety of traditional measures and real world activity, which may allow us to use PROMIS® as a primary method of directing treatment interventions in those with chronic stroke.

Methods

Subjects

Sample Size	9
Age (years)	67.6
Disease duration (years)	3.5

(axis: 0, 20, 40, 60)
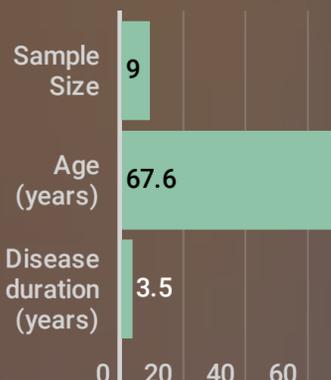
Physical Performance Outcome Measures

- 10 meter walk test (gait speed)
- Timed-Up-and-Go (TUG)
- Brief BESTest

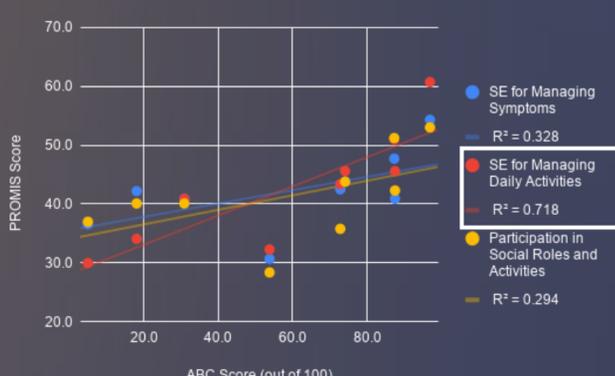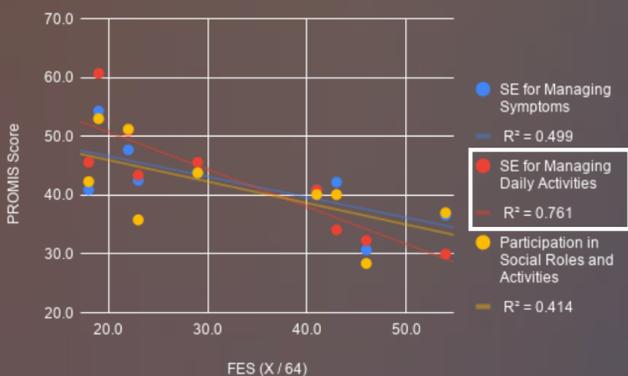### Patient-Reported Outcome Measures

- PROMIS® Physical Function, Depression, Fatigue, Social Roles and Activities, Managing Symptoms, Managing Daily Activities
- Falls Efficacy Scale - International (FES-I)
- Activities-Specific Balance Confidence Scale (ABC)
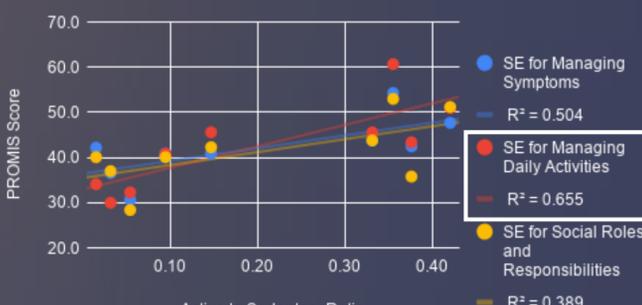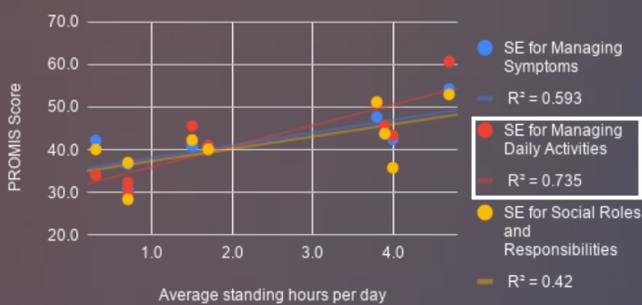
ActivePal Activity Monitors

- Applied to midline of anterior thigh
- Recorded data 24 hrs/day for 7 consecutive days
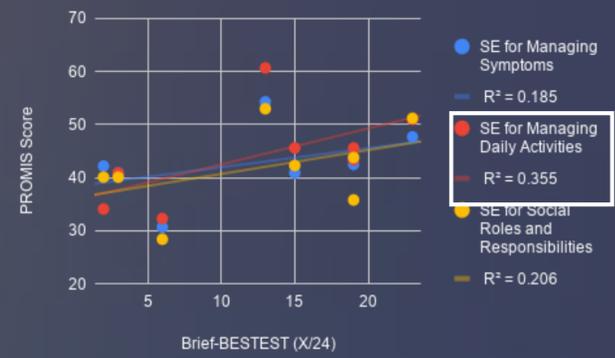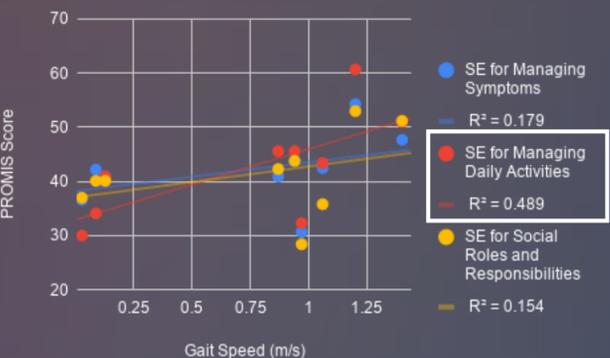- Devices removed and data uploaded to ActivePal software for analysis

Results

PROMIS® Managing Daily Activities vs. Self Reports (ABC, FES-I)

Chart 1 (FES X/64, PROMIS Score):
- SE for Managing Symptoms — R² = 0.499
- SE for Managing Daily Activities — R² = 0.761
- Participation in Social Roles and Activities — R² = 0.414

Chart 2 (ABC Score out of 100, PROMIS Score):
- SE for Managing Symptoms — R² = 0.328
- SE for Managing Daily Activities — R² = 0.718
- Participation in Social Roles and Activities — R² = 0.294

PROMIS® Managing Daily Activities vs. Real World Activity (ActivePal)

Chart 3 (Average standing hours per day, PROMIS Score):
- SE for Managing Symptoms — R² = 0.593
- SE for Managing Daily Activities — R² = 0.735
- SE for Social Roles and Responsibilities — R² = 0.42

Chart 4 (Active to Sedentary Ratio, PROMIS Score):
- SE for Managing Symptoms — R² = 0.504
- SE for Managing Daily Activities — R² = 0.655
- SE for Social Roles and Responsibilities — R² = 0.389

PROMIS® Managing Daily Activities vs. Physical Performance Measures (10-Meter Walk, Brief-BEST)

Chart 5 (Gait Speed m/s, PROMIS Score):
- SE for Managing Symptoms — R² = 0.179
- SE for Managing Daily Activities — R² = 0.489
- SE for Social Roles and Responsibilities — R² = 0.154

Chart 6 (Brief-BESTEST X/24, PROMIS Score):
- SE for Managing Symptoms — R² = 0.185
- SE for Managing Daily Activities — R² = 0.355
- SE for Social Roles and Responsibilities — R² = 0.206

The PROMIS® short form "Self-Efficacy for Managing Daily Activities" showed:
- **Strong correlations** (R² > 0.7) with an individual's FES-I and ABC scores, as well as standing hours per day.
- A **moderate correlation** (R² > 0.5) with the ratio of active to sedentary time.
- **Weak, positive correlations** (R² > 0.3) with the 10 Meter Walk Test and the Brief BESTest

Conclusion

- Physical Therapists should continue to use physical performance measures in the clinic to understand their patient's physical abilities
- The PROMIS® short form "Self-efficacy for Managing Daily Activities" is a valid measure that can be used among patients with chronic stroke to accurately predict their "real world" physical activity level and their self-efficacy related to falls and balance
- This information can be used to promote health and wellness among the chronic stroke population by targeting self-efficacy in order to improve physical activity levels