A 13-Item Community-Dwelling Older Adult Screening Tool (COAST) May Predict Functional Decline In Older Adults


Regis University
Denver, CO

Functional Decline

- Functional Decline = Deterioration of one or more activities of daily living (ADL) or instrumental activities of daily living (IADL)
- Multifactorial process that spans many domains of health
- Annual incidence rate of 11.9% in community-dwelling older adults (CDOA)\textsuperscript{1,2}
- Early functional decline has been shown to decrease quality of life and contributes to increased healthcare costs\textsuperscript{3,4}
- 3-4 years research; evidence for potential measures - 3+ hours
Purpose

- Develop a comprehensive screening tool that looks at multiple domains in order to predict functional decline in community dwelling older adults— the Community-dwelling Older Adult Screening Tool (COAST)

<table>
<thead>
<tr>
<th>Domains Measured</th>
<th>Instruments Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition</td>
<td>Mini Mental State Examination, St. Louis University Mental Status Examination</td>
</tr>
<tr>
<td>Pain</td>
<td>Numeric Pain Rating Scale</td>
</tr>
<tr>
<td>Posture &amp; Flexibility</td>
<td>Postural Distances*, Gonionometry (shoulder flexion, cervical rotation, hip extension)*, Indinometry, Flexcurve Knee, Varus/Valgus Foot Posture Index</td>
</tr>
<tr>
<td></td>
<td>Sit and Reach Test*, Apley's Test</td>
</tr>
<tr>
<td>Balance</td>
<td>One Legged Stance*, Romberg, Sharpend Romberg*</td>
</tr>
<tr>
<td></td>
<td>Multi-directional Reach*, Four Square Step Test, Timed Up and Go*, 5 x Sit to Stand</td>
</tr>
<tr>
<td></td>
<td>Gait Velocity*, Obstacle Course Time</td>
</tr>
<tr>
<td>Strength</td>
<td>Hand Held Dynamometry, Grip Strength</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>FVC, FEV1</td>
</tr>
<tr>
<td>Vision</td>
<td>Peripheral Vision, Depth Perception*, Visual Acuity*</td>
</tr>
<tr>
<td>Bone Density</td>
<td>Heel Ultrasonography</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>Physical Activity Scale for the Elderly</td>
</tr>
<tr>
<td>Depression</td>
<td>CES-D Depression Scale</td>
</tr>
<tr>
<td>ADL</td>
<td>Nottingham Extended Activities of Daily Living Scale</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>Short Form-36*, MOS Social Support</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>Self Efficacy for Exercise Scale</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>Gastrointestinal Symptom Rating Scale</td>
</tr>
<tr>
<td>Incontinence</td>
<td>Index of Incontinence</td>
</tr>
<tr>
<td>Cardiac</td>
<td>Heart Rate, Oxygen Saturation, Blood Pressure, CV Risk Stratification</td>
</tr>
</tbody>
</table>
Methods

- 19 subjects (14 female, 5 male) from convenience sample of residents at the Argyle Assisted Living Facility
- Inclusion criteria: at least 55-years-old, reside in an assisted living facility (similar home health)
- Exclusion criteria: diagnosis of a terminal illness, wheelchair bound, or unable to follow directions
- Participants were assessed every 3 months for one year using the COAST
  - Reliability testers >.92

Methods

- Functional decline was defined as a subject’s inability to continue to participate in the study due to physical, mental or emotional barriers
  - At end of study
- Correlation: Pearson and Spearman Rho
  - determine if a correlation exists between functional decline and each measure
- An independent t test and a Mann Whitney U used to ascertain truly was difference between those with functional decline and those without
Results

- Over the course of a year, 5 out of 19 subjects experienced **functional decline**
  - One subject passed away
  - Two went to a higher level of care
  - Two declined at the assisted living facility
- There were 2 additional subjects **lost to attrition** who were not considered to decline
- 29.4% of the participants were considered to have **functionally declining after one year**
- All measures at baseline were homogenous among those who declined (n=5) and those who did not (n = 12)
  - No significant differences at baseline

Results: Correlations Between Baseline Variables and Functional Decline

- Moderate to strong correlations (0.5-0.8) between FD and baseline variables included:
  - Gender
  - Postural measurements
  - Balance assessments
  - Gait speed
  - ROM
  - Vision
  - Quality of life survey (SF-36)
    - we identified as would be most likely able to predict if someone would decline or not
Posture Measures

Results: Significant Difference in Change in Posture Measurements

Fig. 1 Percent decline from baseline postural measurements
TRAGUS = Tragus measurement to wall; OCCIPUT = Occiput to wall; C7 = C7 to wall; IOK = Index of Kyphosis
Results: Significant Difference in Change in Balance Measures

*dynamic balance – none significant

Fig. 2. Percent decline from baseline balance measurements
SLS=Single Leg Stance; SREC=Sharpened Romberg Eyes Closed; MDRR=Multidirectional Reach Right; MDRL=Multidirectional; Reach Left; MDRF=Multidirectional Reach Forward; TUG=Timed Up and Go

Results: Significant Difference in Change in Flexibility and Gait Measures

*Sit and reach
*shoulder flexion

Fig. 3 Percent decline from baseline flexibility and gait speed
HE GONI=Hip Extension Goniometry; CR=Cervical Rotation Goniometry; GV MAX=Gait Velocity Maximum
Results: Significant Difference in Change in Vision and Quality of Life Measures

![Graph showing results of visual acuity and emotional subscale SF 36](image)

Fig. 4 Percent decline from baseline depth perception and QOL
Depth Perception of vision; PCS=Physical Component Score of SF-36

Discussion

- We propose the use of a 13-item assessment tool to potentially predict FD ~ scores change?
  - Posture
    - forward head measures
    - index of kyphosis
  - Balance
    - single limb stance
    - sharpened Romberg with eyes closed
    - Multidirectional Reach
    - TUG
  - Gait velocity - fast
  - Range of motion
    - goniometric hip extension
    - cervical rotation
    - shoulder flexion
    - sit and reach flexibility
  - Quality of life - physical component score (PCS) and emotional subscale of the SF-36
  - Vision - depth perception and visual acuity
Discussion

- Results concur with those in published literature on individual factors contributing to functional decline: FD correlates with lower extremity functional limitations, lower levels of physical activity, poor self-perceived health, balance impairments, posture and visual impairments.\(^5\)-\(^9\)
- The current study is unique in that it is the first to use a comprehensive group of assessments to examine possible predictors of FD.
- The revised 13-Item COAST requires only 30 minutes for physical tests and measures and 15 minutes for the SF-36 making it more clinically applicable to physical therapy.

Limitations

- Limitations of this study include:
  - Small sample size (n=19)
  - Duration of testing for our subjects (participant fatigue)
  - Difficulty of measuring FD due to the lack of a universal definition
Future Directions

- Further research is needed to validate the results of our study with larger sample sizes using the COAST and with prospective study allow regression analysis to more definitively predict functional decline in older adults.
- Development of interventions to potentially prevent or delay the decline and maintain a higher quality of life.
- Want to use tool or join further evaluation???

Acknowledgements

- This research was supported by a grant from the Argyle Foundation. We wish to thank the residents and staff members of the Argyle Assisted Living Facility.
References


????QUESTIONS????