Recommendations on Risk of Falling Assessment: Outcome of the GeriEDGE Workgroup

Supported by the Academy of Geriatric Physical Therapy of the American Physical Therapy Association

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Introductions for Today

Mindy Renfro, PT, PhD, DPT, GCS

Mariana Wingood, PT, DPT
Today’s Learning Objectives:

Objectives: Upon completion of this seminar, participants will be able to:

1. describe the systematic review process as a means to evaluate current state of evidence about predicting risk of falls in community living older adults.

2. differentiate between concepts of postural control, performance on functional measures of balance, and risk of falling.

3. apply current evidence about clinometric properties to select the most appropriate measure of risk of falling and balance capacity for community living older adults.

4. interpret established indicators of risk of falling (e.g., sensitivity and specificity, likelihood ratio, relative and absolute risk) to identify older adults in need of preventative physical therapy intervention.

5. select the most appropriate measures to determine risk reduction after physical therapy intervention for the older adults in their practice setting.

6. interpret scores on risk of falling and balance capacity measures for use as severity classification and change in function in documentation.

7. identify where further research is necessary to strengthen use of functional measures of postural control and balance, fall risk, and evidence of risk reduction for community living older adults.
APTA

► **Explanation**: American membership organization representing and promoting the profession of physical therapy.

► **Goal**: Foster advancements in physical therapy practice, research, and education.

► **Sections**: Several sections exist to support specialization, including the Academy of Geriatric Physical Therapy and the section on Neurology.
EDGE Task Force History

- EDGE: Evaluation Database to Guide Effectiveness.
- Purpose: To support incorporation of evidence-based outcome measures into clinical practice.
- 2009: Put together by the Section on Research.
- 2011: Geriatrics was added to the EDGE task.
- 2012: GeriEDGE divided into Hip fracture + Balance and Falls.
- The Balance & Falls GeriEDGE is chaired by Dr. Michelle Lusardi.

- This work is from the GeriEDGE Taskforce for Balance & Falls. We would like to thank all of the Taskforce members for supporting this presentation.
GeriEDGE Balance & Falls

- Identify key measures that can be used for:
  - Screening for falls risk.
  - Assessing outcomes of interventions aimed at improving balance and reducing risk of falling.
  - Provide some guidance on using/interpreting measures for clinicians.

- Goal

  - To provide clinicians with the best evidence and tools to use in their practice in order to achieve the best outcome for our patients.
If we knew then....

The Systematic Review Process
First, ask a PICO question. What is a PICO question?

► **PICO =**

► **P** = Population/patient
► **I** = Intervention/indicator
► **C** = Comparator/control
► **O** = Outcome
Then, Conduct a Systematic Review

**Objective**
- PICO question
- Definitions

**Protocol**
- Inclusion/exclusion
- ID Type of studies

**Search**
- ID Key Words
- ID Databases
- Record Keeping
- Retrieve Abstracts

**Screen**
- Review Abstracts
- Retrieve Potentially Relevant papers

**Appraise**
- Select Critical Appraisal Tool
- Evaluate methodology
- Determine final set of studies

**Analysis & Synthesis**
- Extract data
- Consolidate findings
- Report Findings
Look for and Consider the Strongest Evidence

- Systematic reviews and meta-analyses
  - Controlled trials
    - RCTs
    - Non-randomized controlled trials
  - Cohort studies
  - Case-control studies
  - Case reports and case series
    - Prospective case reports
    - Retrospective case reports
  - Editorials, expert opinion, consensus documents

GUIDELINE: Institute of Medicine (rigor)
Set your inclusion/exclusion criteria:

Population: Older adults 65 + years of age
            Living in community / assisted living
            Able to walk

Study Type: Prospective epidemiological (diagnostic)
            Retrospective fall vs no falls (diagnostic)
            Clinimetric properties

Dates: 1990 to 2013

Methods: In English
         n ≥ 30
         ordinal & interval measures

Outcome: Fall event !!!
Choose the Databases

PubMed
PEDro
MEDLINE
CINAHL COMPLETE
The Cochrane Library
List all Potential Measures

ABC Scale
Balance Efficacy Scale
BEST Test / Mini BES
Berg Balance Scale
Brunell Balance Test
Can. Occupational Performance
Community Balance & Mobility Scale
Demura Fall Risk Assessment
Dizziness Handicap Inventory
Dynamic Gait Index
Rall Risk Assessment Tool
Fall Risk By Exposure
Fall Risk Questionnaire
Fall Risk Assessment & Management
Falls Efficacy Scale
Fear of Falling Avoidance
Five times sit to stand
Four Square Step Test
Fullerton Advanced Balance Scale
Functional Gait Assessment
Functional Reach
Gait Efficacy Scale
Hauser Ambulation Index
Hendrich II Fall Model
High Level Mobility Assessment Tool
Home Falls & Accidents Screening Tool
LASA Fall Risk Profile
Melbourne Fall Risk Assessment Tool
mCTSIB
Morse Fall Scale
Patient Specific Functional Scale
Physical Performance Test
POMA / Tinetti
Push & Release Test
Queensland Fall Risk Assessment Tool
Romberg
Short Physical Performance Battery
Single Limb Stance
STRATIFY
STEADI
Tandem Stance
Timed Up and Go
Walking speed (self selected & fast)
Walking While Talking Test...among others
## Record Keeping / Review Process

<table>
<thead>
<tr>
<th>Primary Author</th>
<th>Title</th>
<th>Year</th>
<th>Journal</th>
<th>Citation</th>
<th>Search Info</th>
<th>Reviewers</th>
<th>NOTES/COMMENTS If excluded, criteria violated</th>
</tr>
</thead>
</table>

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Abstracts, so far...

Search 1: 448
Search 2: 90
Search 3: 1757

Reference Review Ongoing

2474 - 445 duplicates = 1837 Abstracts
Yield (so far...)

Duplicates
445

Still in Review
267

Articles Retrieved
305

EXCLUDED
1265
**Test each with Critical Appraisal Tool**

**QUADAS**

**For Studies of Diagnostic Accuracy**

**Max Score:** 14

**Criterion:** 70% (10/14)
Why does this all matter?
Putting this into Context:

**AGS/BGS and NICE guidelines for MDs:**

All older adults to be initially screened

- **Hx of falls**
- Perception of mobility (fear of falling)

If positive for either: further assessment

- Mobility Limitation (ICF activity)
- Balance Impairment (ICF body structure/function)

*Well within scope of PT/OT/RN practice*

If positive for either: multifactorial assessment

- **PT:** balance, gait, muscle performance, endurance
Challenges:

AGS/BGS and NICE CPGs suggest PT referral
CPG for PTs on Falls in Development
Many fall risk and “balance” measures to choose from:
- Self report questionnaires / scales
- Performance-based

Limited number of studies
- link performance to future falls
- evaluate ability to ID change in risk of falls

Minimum “translation” of evidence to practice / lack of standardization
Previous SRs on Fall Risk Measures:


GeriEDGE “PICO” Questions

1. What are the...
   - most informative
   - clinimetrically sound
   - clinically feasible
   - interpretable

...tests/measures that we can use for fall risk screening and assessment for community living older adults?

2. Which tests/measures best reflect reduction of risk of falls as an outcome of intervention?
Conceptual Definitions

Assure that the review team is speaking the same language!
Community Dwelling Older Adults
Adopted definition from SoG CPG Development Group

- 65 years or older
- Residing in community or assisted living settings
- No distinction about functional/frailty status

Excludes:

- Those in acute care, rehab, or SNF/Nursing home settings
- Those with health or neuro condition (e.g. stroke, dementia) that impairs balance or directly increases risk of falls
Balance / Postural Control

“Traditional”

- **Static:** maintain position against gravity
- **Dynamic-Anticipatory:**
  prepare for / adjust during movement
  “internal perturbation”
- **Dynamic-Reactionary:**
  respond to unexpected environmental challenges
  “external perturbation”
Balance / Postural Control
Contemporary (Shumway-Cook & Woollacott 2012)

- Postural Orientation
  relationship between body segments
  relationship of body and environment for task

- Postural stability (balance)
  manage CoM over BoS
  during activity
  across environmental conditions

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Fall

...unplanned/unintentionally coming to rest on the ground or a lower supporting surface...

- Not as part of a medical event
- Not due to an overwhelming external physical force
- May or may not result in injury

Results from interaction:
Risk

...the possibility that something bad or unpleasant will happen (Merriam Webster)

...a situation involving exposure to danger (Oxford)

...something that is likely to be a danger or problem in the future (McMillan)

...the probability that a unwanted health event will occur (CDC)

Assumption:  **RISK IS NEVER ABSENT or ZERO**

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Risk Factor

...causes a person or group to be particularly vulnerable to an unwanted, unpleasant, or unhealthful even (Mosby)

...a variable associated with an increased risk of disease, infection, injury, or unhealthful event (CDC)

...an aspect of behavior or lifestyle, an environmental exposure, or an inborn/inherited characteristic which is known to be associated with health-related condition(s) considered important to prevent. (Dictionary of Epidemiology)

Assumption: SOME ARE MODIFIABLE
Health Screening:

...a process of identifying apparently healthy people who may be at increased risk of a disease or condition (NHS/UK)

...the presumptive identification of unrecognized disease or defect by the application of tests, examinations, or other procedures which can be applied rapidly (WHO)

**GOAL: ID who needs further assessment**
Outcome Measures (APTA)

...direct management of individual patient care
...evaluate the success of interventions
...provide a basis for comparing outcomes from different interventions
...can be at the level of body functions/structures, activity, and participation
...inform profession and community about best clinical practice.
Screening/Risk Assessment
The public health approach to falls
Did you know?

- Every 15 seconds in the U.S., an older adult is treated in the ED for a fall;
- Every 29 minutes, an older adult dies following a fall.
- Leading cause of fatal injury
- Most common cause of nonfatal trauma-related hospital admissions
- More than 2.3 million fall-related injuries treated in EDs annually
- 650,000 hospitalizations
- More than 20,000 deaths.

Different tools for different needs

**Public Screening:**
 PT performs fall risk screening for people who are not engaged in PT services
 ◆ Multifactorial considerations far beyond scope of PT
 ◆ Err on side of false positives to avoid missing anyone at risk
 ◆ Immediate PT fall risk assessment may not be possible

**Screening:**
 ◆ PT practice screens all adults age 65+ for fall risk at arrival to PT clinic at least annually*

**Risk Assessment:**
 ◆ Detailed PT-specific assessment for fall risk*

*GeriEDGE outcomes will help you to choose the best tools
What is a good screening tool?

**GOAL:** Find those at high risk **BEFORE** the first fall! (cast a wide net)
- Simple to do
- Fast
- Low cost / no special equipment needed
- Can be questionnaire &/or performance-based: STEADI toolkit from CDC available at [www.cdc.gov/injury/STEADI](http://www.cdc.gov/injury/STEADI)
- Minimum training needed
- Evidence based “cut” scores
- Better to err on the side of false positives and assess too many
Screening: Evidence


In a public outreach setting:
Recommendation

CDC’s STopping Elderly Accidents, Deaths, & Injuries: “STEADI” toolkit
◆ Multifactorial fall risk tool
◆ self-administered via questionnaire
◆ Concludes with performance-based
  TUG
  30-second chair stand
  4-stage balance test

Available at www.cdc.gov/injury/STEADI
In Clinic: Recommendation

Adopt AGS/BGS 2010 Screening Guidelines

*EVERY Patient/Client 65 + years (regardless of reason for referral)*

During Initial Interview:
1. Have you had one or more falls in the past year?
   (frequency, context, fall characteristics)
2. Are you here because you recently fell?
3. Do you have difficulty with walking or balance?


If yes to ANY (or if observe mobility impairment):

   Proceed to PT Fall Risk Assessment...
Choosing a tool/measure

Questions to ask:

- Quality of info provided? (goal of our SR...)
- How feasible (time/cost) ?
- How portable / what equipment ?
- Is performance better than report ?
- Has measure been eval’d in my “population” or setting ?
- What dimensions of risk / balance are captured ?
- Can I get better info using a set of measures ?
- Who needs to do the test? What is the training ?
- How easily can results be interpreted?
- How to use in documentation ?
Take Home Messages

1. Begin and/or continue to offer regularly scheduled older adult fall risk screenings. **Prevent the FIRST fall!**

2. Add fall risk screenings to ALL clinic visits for older adults.

3. Utilize evidence-based fall risk screening tools, evidence-based fall prevention programs, and monitor care with evidence-based outcome measures.

4. Always match your tools to the proper population where they were tested.

5. Watch for final results of GeriEDGE to choose the most **robust** evidence-based screening tools and outcome measures.
Thank You all for your work to help prevent falls!