

Optometrists Instrumental in Fall Prevention

Valerie Quan Wren, OD, FAAO

Disclosure Statement

- Nothing to disclose

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Introduction

- An 83-year-old woman is the caretaker for her 90-year-old husband with moderate Parkinson's disease and osteoarthritis, in an assisted living facility.
- Is this patient or caregiver at risk?
- How can OD's be impactful in fall prevention?

Learning Objectives

- Falls statistics in the elderly
- Health care costs and quality of life
- Tools to assess fall risk
- Safety recommendations
- Inter-professional management

Facts about Falls

- 1 in 3 adults over 65 years of age experience at least 1 fall each year
- 50% of these patients experience multiple falls
- Less than half talk to health providers about it

Facts about Falls

Major cause of:

- Injury (especially TBI)
- Healthcare utilization (hospitalizations)
- Mortality (subarachnoid hemorrhages)

Fall are ...

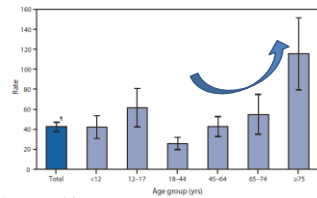
- Leading cause of injury death
- Most common cause of nonfatal injuries and hospital admissions for trauma
- In 2008, over 19,700 older adults died from unintentional fall injuries

As we age...

QuickStats: Rate* of Nonfatal, Medically Consulted Fall Injury Episodes,† by Age Group

Weekly

February 3, 2012 / 61(04):81



* Per 1,000 population.

† Annualized rates of injury episodes for which a health-care professional was contacted either in person or by telephone for advice or treatment. An injury episode refers to a traumatic event in which the person experienced one or more injuries from an external cause.

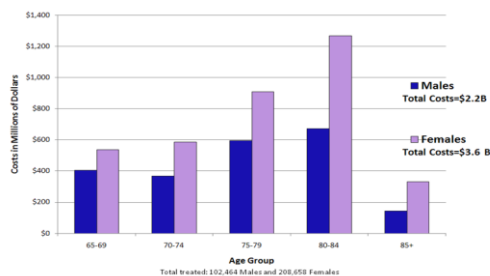
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6104a8.htm>

Trends ...

- Mortality rates from falls have risen sharply over the past decade
- In 2009, 2.2M nonfatal fall injuries among older adults were treated in ER, 1 in 4 were hospitalized
- In 2000, direct medical costs of falls totaled a little over \$19B—\$179M for fatal falls and \$19B for nonfatal fall injuries

How costly are falls?

Total Lifetime Medical Costs of Unintentional Fall-Related Injuries in People 65 Years and Older Treated in Emergency Departments & Hospitalized, by Sex and Age, United States, 2005



Total treated: 102,464 Males and 208,658 Females

<http://www.cdc.gov/homeandrecreationsafety/Falls/data/cost-estimates-figures1-2.html>

Outcomes

- Lacerations
- Fractures
- Head trauma
- Fear of falling -> Reduced mobility
- Mortality

TBI's

- Traumatic brain injuries due to falls caused nearly 8,000 deaths and 56,000 hospitalizations in 2005 among Americans 65 and older.¹
- Falls are the most common cause of TBI. TBI accounted for 46% of fatal fall among older adults.²

TBIs

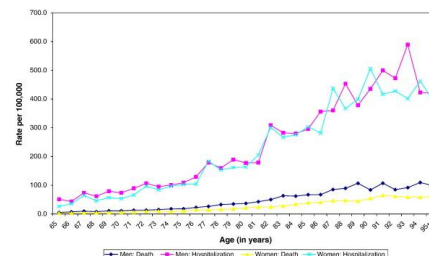


Fig. 1. Fall-related traumatic brain injury deaths and nonfatal hospitalizations among older adults, by age and sex — United States.

¹ Thomas KE. Fall-related traumatic brain injury deaths and hospitalizations among older adults, J Safety Research, Vol 39, Issue 3, 2008, Pages 269–272.

² Stevens JA. Fatalities and injuries from falls among older adults — United States, 1993–2003 and 2001–2005. MMWR 2006a;55(45).

Thomas KE. Fall-related traumatic brain injury deaths and hospitalizations among older adults, J Safety Research, Vol 39, Issue 3, 2008, Pages 269–272.

Hip Fractures

- 1 in 5 hip fracture patients die within a year of injury
- 1 in 4 go to nursing homes for 1 year
- Women sustain 75% of hip fractures
- Rate increases exponentially with age
- Osteoporosis increases risk
- Down-regulation ensues

Falls in Nursing Homes

- Muscle weakness
- Gait problems
- Environmental hazards
 - Poor lighting, bed height, wheelchair
- Medications
 - Sedative
 - Anti-anxiety drugs

CDC Recommendations

- Regular exercise program
- Review medications
- Vision assessment
- Home safety

www.cdc.gov/injury



Vision and Balance

Ability to safely navigate complex environments depends on:

- visual input
- path planning
- obstacle avoidance

Role of Optometry

To diagnose and/or treat (optically and/or with vision rehab) vision disturbances to optimize vision function for use in:

- Rehabilitation
- iADLs impacting overall QOL

Vision Assessment

- **History**
 - Inquire about falls and circumstances
 - Review medications
 - Mental status
- **Examination**
 - Visual acuity
 - Binocularity/depth perception
 - Visual fields
 - Contrast sensitivity
 - Blood pressure



Increased risk if ...

Vision loss

- Contributing factor to falls and fractures
- Inferior visual field loss in glaucoma
- Peripheral vision loss from stroke
- Poor depth perception

Peripheral neuropathy

Vestibular dysfunction

Fall Risk Assessment

- **Physical exam**
 - Gait observation
 - Stride length
 - Strength assessment
 - Flexion
 - Extension
 - Romberg screening
 - Tests the status of the vestibulospinal tracts along the posterior column during static standing. Abnormal findings may indicate a dysfunction in the vestibulospinal tracts or processing of sensory organization in the CNS.



Dizziness Handicap Inventory (DHI)

- 25-item self-assessment scale to quantify the patient's perception of handicap as a result of dizziness. **Physical, emotional** and **functional** impact of dizziness on daily life are explored.

Example (Yes/No/Sometimes)

- *P1. Does looking up increase your problem?*
- *E2. Because of your problem, do you feel frustrated?*
- *F3. Because of your problem, do you restrict your travel for business or recreation?*
- Highest score = 100
- High score indicates greater level of handicap

Dynamic Gait Index (DGI)

- 8 gait tasks including walking and walking at different speeds, walking moving the head in pitch (around the intra-aural axis) and yaw (movement on vertical axis) planes, pivoting, walking over objects, walking around objects, and going up and down stairs.
- Validated for fall risk at <20 of point score of 24 total.

Dynamic Gait Index (DGI) Videos

1. Gait level surface
2. Change in gait speed
3. Gait with horizontal head turns
4. Gait with vertical head turns
5. Gait and pivot turn
6. Step over obstacle
7. Step around obstacles
8. Steps

Dynamic Gait Index (DGI) Score

- 21/24 or above = minimal to no risk for falls
- Below 21 = risk for falls present (lower score indicates higher risk)
- Common score for moderate stage Parkinson Disease = 9-11/24

Management

- **Prescribing considerations**
 - Lens choices for ambulation
 - Tints
 - Frame choice
- **Educate caregiver**
 - Vision status
 - Lens strategies for safe ambulation
 - Blood pressure and medications

Referrals

- Internist/Neurologist/ENT
- Physical therapist
- Podiatry
- Pharmacy
- Social worker
 - Can help manage living situation
- Inter-professional management
 - Notification to health care providers

- Which is the most dangerous area in the house?

- A. Kitchen
- B. Bathroom
- C. Stairway
- D. Bedroom

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- A. Kitchen
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- D. Bedroom

Resources

- Strength and balance exercises
- Community based programs
- In-home and device assessment



www.cdc.gov/injury

Home Safety Modifications

- Declutter (walking path)
- Double sided tape (rugs)
- Add non-slip surfaces and grab bars
- Move items within reach
- Improve lighting and reduce glare
- Add handrails
- Wear shoes inside and outside house





- Who me?



Web resources

CDC's "What You Can Do To Prevent Falls" and "Home Safety Checklist"

brochures for older adults www.cdc.gov/ncipc/duip/fallsmaterials.htm

CDC Falls Prevention page www.cdc.gov/ncipc/duip/preventadultfalls.htm

Center of Excellence for Fall Prevention www.stopfalls.org

National Institute on Aging, AgePage: Preventing Falls and Fractures

www.niapublications.org/agepages/PDFs/preventing_Falls_and_Fractures.pdf

The American Geriatrics Society Guideline for the Prevention of Falls in Older Persons

www.american geriatrics.org/products/positionpapers/abstract.shtml

Center for Healthy Aging Falls Free Electronic News

www.healthyagingprograms.org

California Blueprint for Falls Prevention

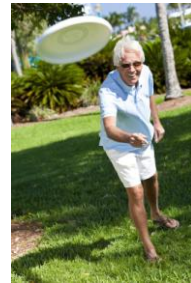
www.archstone.org/publications2292/publications_show.htm?doc_id=246660

National Safety Council www.nsc.org/issues/fallstop.htm

"Getting Up From a Fall" handout from the American Academy of

Orthopaedic Surgeons orthoinfo.aaos.org/topic.cfm?topic=A00098

THANK YOU



DIZZINESS HANDICAP INVENTORY

Name: _____ Date: _____

Part I

Instructions: The purpose of this scale is to identify difficulties that you may be experiencing because of your dizziness or unsteadiness. Please indicate answer by circling “yes” or “no” or “sometimes” for each question. Answer each question as it pertains to your dizziness or unsteadiness problem only.

- | | | | |
|--|-----|----|-----------|
| P1. Does looking up increase your problem? | Yes | No | Sometimes |
| E2. Because of your problem, do you feel frustrated? | Yes | No | Sometimes |
| F3. Because of your problem, do you restrict your travel for business or recreation? | Yes | No | Sometimes |
| P4. Does walking down the aisle of a supermarket increase your problem? | Yes | No | Sometimes |
| F5. Because of your problem, do you have difficulty getting into or out of bed? | Yes | No | Sometimes |
| F6. Does your problem significantly restrict your participation in social activities such as going out to dinner, going to the movies, dancing, or to parties? | Yes | No | Sometimes |
| F7. Because of your problem, do you have difficulty reading? | Yes | No | Sometimes |
| P8. Does performing more ambitious activities like sports, dancing, household chores such as sweeping or putting away dishes increase your problem? | Yes | No | Sometimes |
| E9. Because of your problem, are you afraid to leave your home without having someone accompany you? | Yes | No | Sometimes |
| E10. Because of your problem, have you been embarrassed in front of others | Yes | No | Sometimes |
| P11. Do quick movements of your head increase your problem? | Yes | No | Sometimes |
| F12. Because of your problem, do you avoid heights? | Yes | No | Sometimes |
| P13. Does turning over in bed increase your problem? | Yes | No | Sometimes |
| F14. Because of your problem, is it difficult for you to do strenuous housework or yard work? | Yes | No | Sometimes |
| E15. Because of your problem, are you afraid people might think you are intoxicated? | Yes | No | Sometimes |
| F16. Because of your problem, is it difficult for you to go for a walk by yourself? | Yes | No | Sometimes |
| P17. Does walking down a sidewalk increase your problem? | Yes | No | Sometimes |
| E18. Because of your problem, is it difficult for you to concentrate? | Yes | No | Sometimes |

F19. Because of your problem, is it difficult for you walk around the house in the dark?	Yes	No	Sometimes
E20. Because of your problem, are you afraid to stay home alone?	Yes	No	Sometimes
E21. Because of your problem, do you feel handicapped?	Yes	No	Sometimes
E22. Has your problem placed stress on your relationships with members of your family or friends?	Yes	No	Sometimes
E23. Because of your problem, are you depressed?	Yes	No	Sometimes
F24. Does your problem interfere with your job or household responsibilities?	Yes	No	Sometimes
P25. Does bending over increase your problem?	Yes	No	Sometimes

Part II

Instructions: Put a check in the box that best describes you.

<input type="checkbox"/>	Negligible symptoms (0)
<input type="checkbox"/>	Bothersome symptoms (1)
<input type="checkbox"/>	Performs usual work duties but symptoms interfere with outside activities (2)
<input type="checkbox"/>	Symptoms disrupt performance of both usual work duties and outside activities (3)
<input type="checkbox"/>	Currently on medical leave or had to change jobs because of symptoms (4)
<input type="checkbox"/>	Unable to work for over one year or established permanent disability with compensation payments (5)

 **STOP HERE**

Yes	Sometimes	No	
P (7) _____ x4=_____	+	_____ x2=_____	+
		_____ x0=_____	Physical Items _____ (28)
E (9) _____ x4=_____	+	_____ x2=_____	+
		_____ x0=_____	Emotional Items _____ (36)
F (9) _____ x4=_____	+	_____ x2=_____	+
		_____ x0=_____	Functional Items _____ (36)
			TOTAL _____
			(max 100 pts)

Dynamic Gait Index Score Sheet

(Adapted from Shumway-Cook & Woollacott Motor Control: Theory and Practical Applications, 1995)

PATIENT: _____

DATE: _____

1. Gait level surface _____

Instructions: Walk at your normal speed from here to the next mark (20')

Grading: Mark the lowest category that applies.

- (3) **Normal:** Walks 20', no assistive devices, good speed, no evidence for imbalance, normal gait pattern.
- (2) **Mild Impairment:** Walks 20', uses assistive devices, slower speed, mild gait deviations.
- (1) **Moderate Impairment:** Walks 20', slow speed, abnormal gait pattern, evidence for imbalance.
- (0) **Severe Impairment:** Cannot walk 20' without assistance, severe gait deviations or imbalance.

2. Change in gait speed _____

Instructions: Begin walking at your normal pace (for 5'), when I tell you "go," walk as fast as you can (for 5'). When I tell you "slow," walk as slowly as you can (for 5').

Grading: Mark the lowest category that applies.

- (3) **Normal:** Able to smoothly change walking speed without loss of balance or gait deviation. Shows a significant difference in walking speeds between normal, fast and slow speeds.
- (2) **Mild Impairment:** Is able to change speed but demonstrates mild gait deviations, or no gait deviations but is unable to achieve a significant change in velocity, or uses an assistive device.
- (1) **Moderate Impairment:** Makes only minor adjustments to walking speed, or accomplishes a change in speed with significant gait deviations, or changes speed but loses significant gait deviations, or changes speed but loses balance but is able to recover and continue walking.
- (0) **Severe Impairment:** Cannot change speeds, or loses balance and has to reach for wall or be caught.

3. Gait with horizontal head turns _____

Instructions: Begin walking at your normal pace. When I tell you to "look right," keep walking straight, but turn your head to the right. Keep looking to the right until I tell you, "look left," then keep walking straight and turn your head to the left. Keep your head to the left until I tell you "look straight," then keep walking straight, but return your head to the center.

Grading: Mark the lowest category that applies.

- (3) **Normal:** Performs head turns smoothly with no change in gait.
- (2) **Mild Impairment:** Performs head turns smoothly with slight change in gait velocity, i.e., minor disruption to smooth gait path or uses walking aid.
- (1) **Moderate Impairment:** Performs head turns with moderate change in gait velocity, slows down, staggers but recovers, can continue to walk.
- (0) **Severe Impairment:** Performs task with severe disruption of gait, i.e., staggers, outside 15" path, loses balance, stops, reaches for wall.

4. Gait with vertical head turns _____

Instructions: Begin walking at your normal pace. When I tell you to "look up," keep walking straight, but tip your head up. Keep looking up until I tell you, "look down," then keep walking straight and tip your head down. Keep your head down until I tell you "look straight," then keep walking straight, but return your head to the center.

Grading: Mark the lowest category that applies.

- (3) **Normal:** Performs head turns smoothly with no change in gait.
- (2) **Mild Impairment:** Performs task with slight change in gait velocity, i.e., minor disruption to smooth gait path or uses walking aid.
- (1) **Moderate Impairment:** Performs task with moderate change in gait velocity, slows down, staggers but recovers, can continue to walk.
- (0) **Severe Impairment:** Performs task with severe disruption of gait, i.e., staggers, outside 15" path, loses balance, stops, reaches for wall.

5. Gait and pivot turn _____

Instructions: Begin walking at your normal pace. When I tell you, "turn and stop," turn as quickly as you can to face the opposite direction and stop.

Grading: Mark the lowest category that applies.

- (3) **Normal:** Pivot turns safely within 3 seconds and stops quickly with no loss of balance.
- (2) **Mild Impairment:** Pivot turns safely in > 3 seconds and stops with no loss of balance.
- (1) **Moderate Impairment:** Turns slowly, requires verbal cueing, requires several small steps to catch balance following turn & stop.
- (0) **Severe Impairment:** Cannot turn safely, requires assistance to turn and stop.

Dynamic Gait Index Score Sheet

(Adapted from Shumway-Cook & Woollacott Motor Control: Theory and Practical Applications, 1995)

6. Step over obstacle ____

Instructions: Begin walking at your normal speed. When you come to the shoebox, step over it, not around it, and keep walking.

Grading: Mark the lowest category that applies.

- (3) **Normal**: Is able to step over the box without changing gait speed, no evidence of imbalance.
- (2) **Mild Impairment**: Is able to step over box, but must slow down and adjust steps to clear box safely.
- (1) **Moderate Impairment**: Is able to step over box but must stop, then step over. May require verbal cueing.
- (0) **Severe Impairment**: Cannot perform without assistance.

7. Step around obstacles ____

Instructions: Begin walking at normal speed. When you come to the first cone (about 6' away), walk around the right side of it. When you come to the second cone (6' past first cone), walk around it to the left.

Grading: Mark the lowest category that applies.

- (3) **Normal**: Is able to walk around cones safely without changing gait speed; no evidence of imbalance.
- (2) **Mild Impairment**: Is able to step around both cones, but must slow down and adjust steps to clear cones.
- (1) **Moderate Impairment**: Is able to clear cones but must significantly slow speed to accomplish task, or requires verbal cueing.
- (0) **Severe Impairment**: Unable to clear cones, walks into one or both cones, or requires physical assistance.

8. Steps ____

Instructions: Walk up these stairs as you would at home, i.e., using the railing if necessary. At the top, turn around and walk down.

Grading: Mark the lowest category that applies.

- (3) **Normal**: Alternating feet, no rail.
- (2) **Mild Impairment**: Alternating feet, must use rail.
- (1) **Moderate Impairment**: Two feet to a stair, must use rail.
- (0) **Severe Impairment**: Cannot do safely.

TOTAL SCORE: ____ / 24

Scoring Information: 21/24 or above = minimal to no risk for falls

Below 21 indicates risk for falls and the lower the score the more the risk

Common score for moderate stage Parkinson Disease = 9-11/24.