A Blueprint for Activity and Falls Prevention

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July 11, 2008
Objectives

1) Explain intrinsic & extrinsic fall risk factors.

2) Describe national initiatives for falls prevention.

3) Design effective interventions.

4) Provide relevant education.

5) Identify evidence-based resources & tools for patients, consumers, & health care providers.
Why?

- 60% falls in home
- 30% falls in public places
- 10% falls in healthcare institutions

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Easton et al. Fall Prevention and Home Safety: The Role of the Home Health Professional, CDC
## Intrinsic/Extrinsic Risk Factors

**Intrinsic**
- Sensory
  - Somatosensory
  - Vision
  - Vestibular
- Musculoskeletal
  - Weakness
  - Gait & balance impairment
  - Impaired ADL
- Other
  - Age
  - Illness
  - Dementia
  - Drugs
  - Orthostasis

**Extrinsic**
- Environmental hazards
- Footwear
- Restraints
Risk Factors for Falls & Fractures

Intrinsic + Extrinsic Factors

Precipitating Factors

Behavioral Factors

= www.stopfalls.org
The Changing Approach to Falls in the Elderly

http://www.aafp.org/afp/20000401/2159.html

Steinweg KK. Am Fam Physician 1997;56:1815-22,1823.
National Initiatives

- 2005 White House Conference on Aging
- Elder Falls Prevention Act & Safety of Seniors Act
- Public-private partnership for Falls Free™ Initiative & Falls Free™ Coalition
Falls Free™ Coalition

• Collection of national & state coalitions
  – Organized by National Council on Aging’s Center for Healthy Aging
  – Support from Archstone Foundation & Home Safety Council
  – Endorsed by Professional Organizations
    • AGS, APTA, AOTA, ASCP, CDC, NIA, NCOA, AARP to name a few
  – Support from State Coalitions
    • CA Stop Falls Network, Nebraska F1rst, to name a few
Fall Prevention


NCOA Center for Healthy Aging, 2005
1. Increase physical mobility & activity
2. Management of medical issues and medications
3. Increase home safety
4. Increase environmental safety in community

www.f1rst.org
TRUE OR FALSE (examples of questions from www.f1rst.org)

- The most common injuries from falls are fractured bones that have been weakened by osteoporosis.
- Over 50% of people age 75+ have a constant fear of falling.
- 60% of seniors that fall each year fall in their own homes.
- Tai Chi can reduce the chances of falling by up to 50%.
Influence of Policy & Payment

- V-code V15.88 risk falls

- PQRI (Physician Quality Reporting Mechanism)
  - Measure #4 Screening for Future Fall Risk

- CARE (Medicare Continuity Assessment Record and Evaluation Tool)
  - CSM standardized patient assessment tool to be used at acute hospital discharge and at PAC admission & discharge.

- [ww.cms.hhs.gov](http://ww.cms.hhs.gov)
Falls Risk Assessment & Screening

Common items (comprehensive view)
Functional Measures of Balance & Mobility
Fitness Indicators
And what about fear and confidence!
## Fall Risk Assessment Measures

**Common Items**

- Mental status (13)
- Fall history (10)
- Mobility (10)
- Other diagnoses (8)
- Incontinence (8)
- Drugs (7)
- Sensory deficits (7)
- Balance (5)
- Age (4)
- Assistive Device (4)
- Weakness (4)
- Gender (3)
- Acuity (3)
- Restraint use (1)

*Perell K et al. J Gerontol Med Sci 2001*
Comprehensive Falls Risk Assessment – AGS Guidelines

Older persons who:

• Require medical attention for fall related injury

• Report recurrent falls (2 or more in previous 6 months)

• Have gait and balance problems

JAGS 2003
Falls & Balance Screening

• No single test is sufficient

• Depends on:
  – Functional level of patient
  – Regulatory requirements
  – Psychometric properties of measures
  – Your preference
Functional Measures*

Static (sit/stand)
- Berg
- Functional reach
- Multidirectional reach

Dynamic (mobility)
- 2, 6, 12 min walk
- Timed walk
- TUG
- Dynamic Gait Index
- POMA (Tinetti)

*Not all inclusive (by any means!)
http://www.chcr.brown.edu/GERIATRIC_ASSESSMENT_TOOL_KIT.PDF
# Berg Balance Test

1. Sit unsupported
2. Sit to stand
3. Stand unsupported
4. Stand eyes closed
5. Stand feet together
6. Forward reach
7. Object from floor
8. Turn look over shld
9. Turn 360 degrees
10. Alternate stool touch
11. Heel/toe stance
12. Stand 1 ft front
13. Stand to sit
14. Transfer 1 leg

Functional Reach

• With feet shoulder distance apart – ask client to raise arm to 90 degrees – reach as far as can safely without taking step.

• Measure distance reached (< 5” increased risk for falls)

• Norms for 70-87 yr old (inches)
  – Men 14.9 (2.2)
  – Women 10.5 (3.5)

Multidirectional Reach

• Similar to functional reach

• Repeat while leaning backwards and to each side

• Measure distance (inches)
  – Forward (8.9 ± 3.4)
  – Backward (4.6 ± 3.1)
  – RR (6.8 ± 3.0)
  – LR (6.6 ± 2.9)

Newton, 2001
Walk times

- 2, 6, 12 min walk times
- Timed walk – consider threshold < 1.0 m/s
- (ex. 10 m walk)
  - Men
    - Self-selected 1.33 m/s
    - Fast 2.08 m/s
  - Women
    - Self-selected 1.27 m/s
    - Fast 1.75 m/s
The Timed Up & Go Test

1. Patient is in a seated position.
2. Place a visible object 8 feet away from the patient.
3. Have the patient get up and walk around the object and sit back down.

Allow them to practice once.
Then time them 3 times.

• Helps for accurately scoring on the OASIS function M0 points 680 (toileting) and 700 (Ambulation/locomotion).

Scores ( < 10 s normal; > 13 sec increased risk falls)
• > 20 but < 30 indicate potential problem
• > 30 sec indicate ADL safety concerns

Dynamic Gait Index

1. Gait level surface 3 = normal
2. Change gait speed 2 = mild
   impairment 1 = moderate
3. Horizontal head 0 = severe (requires
   movements assistance)
4. Vertical head
   movements
5. Pivot turn
6. Over obstacles
7. Around obstacles
8. Stairs

http://www.chcr.brown.edu/GERIATRIC_ASSESSMENT_TOOL_KIT.PDF
POMA (Tinetti Gait/Balance Test)

Balance (0-16)
- Sitting balance
- Arises
- Attempts to arise
- Immediate standing balance
- Standing balance
- Nudge test
- Eyes closed
- Turn 360 degrees
- Sit down

Gait (0-12)
- Gait initiation
- Step length/width
- Step symmetry
- Step continuity
- Path
- Trunk
- Step Width

Total score 0-28, if < 19 high risk for falls, 19-24 moderate risk for falls
Senior Fitness Test

- 30 second chair stand
- Arm curl
- 6-minute walk or
- 2-minute step test
- Chair sit-and-reach
- Back Scratch
- 8 foot up-and-go

## Senior Fitness Test

<table>
<thead>
<tr>
<th>Test</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair stands (#)</td>
<td>&lt; 8 unassisted</td>
</tr>
<tr>
<td>Arm curls (#)</td>
<td>&lt; 11 curls</td>
</tr>
<tr>
<td>6 min walk (yds)</td>
<td>&lt; 350 yd</td>
</tr>
<tr>
<td>2 min step (# steps)</td>
<td>&lt; 65 steps</td>
</tr>
<tr>
<td>Chair sit-and-reach (+/-)</td>
<td>men &lt; 4”; women &lt; 2”</td>
</tr>
<tr>
<td>Back scratch (+/-)</td>
<td>men &lt; 4”; women &lt; 2”</td>
</tr>
<tr>
<td>8 ft up-and-go</td>
<td>&gt; 9 sec</td>
</tr>
</tbody>
</table>
ABC Scale

1. Walk around house
2. Up and down stairs
3. Pick-up slipper from floor
4. Reach at eye level
5. Reach up on tip toes
6. Stand on chair to reach
7. Sweeping floor
8. Walk outside to nearby car
9. Get in / out of car
10. Walk across parking lot
11. Up and down ramp
12. Walk in crowded hall
13. Walk in crowd/bumped
14. Escalator holding on
15. Escalator not holding rail
16. Walk on icy sidewalk

Falls Efficacy Scale

1. Cleaning house
2. Getting dressed and undressed
3. Preparing simple meals
4. Taking a bath or shower
5. Simple shopping
6. Getting in and out of car
7. Going up and down stairs
8. Walking around neighborhood
9. Reaching into cabinets and closets
10. Hurrying to answer the phone

Evidence Based – Best Practices

- Rand Report, 2003
- Cochrane Review, 2001
- AGS, 2003

All are comprehensive

- Assess & treat any injury
- Determine precipitating/behavioral causes
- Prevent recurrence
Interventions

• Activity/exercise/mobility

• Safety
  – Environment
  – Behavioral
  – Assistive aids/devices
Overall rehab exercise

**Balance**
- Task oriented
- Framework Task Type
  - Steady state
  - Reactive
  - Proactive
- Framework-Component
  - Sensory
  - Motor
  - Cognitive

**Aerobic training**
- walking
- cycling
- aquatics

**Strength training**
- resistive bands
- resistance machines

Tai-chi or similar activities
Basic examples - activities

• Sitting
  – leaning
  – Reaching

• Sit-to-stand
  – vary height, reps, surfaces

• Standing
  – leaning
  – reaching
  – stepping

• Postural alignment

• Sequence activities

• Walking activities

Examples of rehab activities

http://www.mayoclinic.com/health/balance-exercises/
Examples of rehab activities

• Tai chi or similar movements

http://www.aarpmagazine.org/health/Articles/a2003-08-20-boost.html
Examples of aerobics activities

• Walking
• Cycling
• Aquatics

• ACSM/AHA recommendations
  – 30 minutes/day on 5 or more days per week

Example of rehab activities

Strength training (example)
• Hip
  – Flexors (march in place)
  – Extensors (back kicks)
  – Abductors (side kicks)

• Knee
  – Squats
  – Sit-to-stand

• Ankle
  – Heel rise
  – Dorsiflexion

http://www.firststepstoactivehealth.com/youcan/index.htm
Available Programs

• Wii Fit™
  – Is it appropriate for older adults?
  – Precautions
## Balance Framework by Tasks

<table>
<thead>
<tr>
<th>Sit</th>
<th>Vary conditions</th>
<th>Vary stimulus</th>
<th>Esp walking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- vision</td>
<td>- speed</td>
<td>- distance</td>
</tr>
<tr>
<td></td>
<td>- surface</td>
<td>- amplitude</td>
<td>- temporal</td>
</tr>
<tr>
<td></td>
<td>- base of support</td>
<td>- direction of stimulus</td>
<td>- ambient</td>
</tr>
<tr>
<td></td>
<td>- sway all</td>
<td></td>
<td>- terrain</td>
</tr>
<tr>
<td></td>
<td>direction</td>
<td></td>
<td>- carry load</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- postural transitions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- attentional demand</td>
</tr>
</tbody>
</table>

### Stand

- Vary conditions
- Vary stimulus
- Esp walking

### Walking

- Vary conditions
- Vary stimulus
- Esp walking
Safety-Environment

Inside house
- Clutter
- Surfaces
- Unstable furniture
- Pets
- Lighting
- Furniture/support placement

Outside house
- Cracked sidewalks
- Uneven steps
- Lack handrails
- Traffic
- Bad weather
- Distractions
- Obstacles

www.homesafetycouncil.org
1 Hazard/Barrier
2 Surface
3 Reach
4 Visual
5 Physical

http://www.aarp.org/families/home_design/rate_home/a2004-03-02-b-checklist.html
Q: Are the handrails loose or broken? Is there a handrail on only one side of the stairs?

- Fix loose handrails or put in new ones. Make sure handrails are on both sides of the stairs and are as long as the stairs.

Q: Are the things you use often on high shelves?

- Move items in your cabinets. Keep things you use often on the lower shelves (about waist level).

Q: Is your step stool unsteady?

- If you must use a step stool, get one with a bar to hold on to. Never use a chair as a step stool.

http://www.cdc.gov/ncipc/pub-res/toolkit/Falls_ToolKit/DesktopPDF/
Q: Do you need some support when you get in and out of the tub or up from the toilet?

☐ Have a carpenter put grab bars inside the tub and next to the toilet.

Q: Is the light near the bed hard to reach?

☐ Place a lamp close to the bed where it’s easy to reach.

Q: Is the path from your bed to the bathroom dark?

☐ Put in a night-light so you can

http://www.cdc.gov/ncipc/pub-res/toolkit/Falls_ToolKit/
Safety-Behavior

“Risk taking” behaviors
  – Example: climbing on stools/ladders
    - “But we have always kept that there…”

Neglecting preventative actions
  – Example: leaving spills on floors

Wardrobe choices
  – Shoes
    • Low heeled, sturdy, not worn out
  – Clothes
    • Fitted, not long, not too loose fitting pants
Safety-Special Aids/Equipment

• Mobility Devices
• Monitors
  – Bed and chair
  – Fall alarms
  – Bedside mats
• Railings/Grab bars
• Hip protectors
Mobility devices

WALKING MADE SIMPLER:
Walking Canes

Mobility devices

http://www.mayoclinic.com/health/walker/HA00060
Monitors
Railings/Grab bars
Hip protectors

• Evidence
  – Initial studies show high effectiveness
  – More recent
    • Hard to get compliance
    • Contribution from patient selection & overall program

• Examples
  – Safehip, KPH, CuraMedica, HipGuard, HIPS

Resources/Community Programs

- Risk factor screen and intervention
- Post-fall assessment
- Exercise program
- Environmental inspection/modification
- Evidence based examples (http://www.safeaging.org/)
Fear Of Falling: A Matter Of Balance

The guiding hypothesis behind the Fear of Falling study is that a theoretically grounded 8 session group intervention focusing on...
Evidence-based programs

- Strong for Life
- Falls Prevention Project
- FRIENDS (Fall reduction initiative: establishing new directions for safety)
Falls and Older Adults
Preventing Falls and Fractures - Home Safety

At home and elsewhere, try to avoid wet floors and clean up spills right away. Use only non-skid wax on waxed floors at home.
Four things YOU can do to prevent falls:

1. Begin a regular exercise program

Exercise is one of the most important ways to lower your chances of falling. It makes you stronger and helps you feel better. Exercises that improve balance and coordination (like Tai Chi) are the most helpful.

Lack of exercise leads to weakness and increases your chances of falling.

Ask your doctor or health care provider about the best type of exercise program for you.

2. Have your health care provider review your medicines

Have your doctor or pharmacist review all the medicines you take, even over-the-counter medicines. As you get older, the way medicines work in your body can change. Some medicines, or combinations of medicines, can make you sleepy or dizzy and can cause you to fall.

3. Have your vision checked

Have your eyes checked by an eye doctor at least once a year. You may be wearing the wrong glasses or have a condition like glaucoma or cataracts that limits your vision. Poor vision can increase your chances of falling.

4. Make your home safer

About half of all falls happen at home. To make your home safer:

- Remove things you can trip over (like papers, books, clothes, and shoes) from stairs and places where you walk.
- Remove small throw rugs or use double-sided tape to keep the rugs from slipping.
- Keep items you use often in cabinets you can reach easily without using a step stool.
- Have grab bars put in next to your toilet and in the tub or shower.
- Use non-slip mats in the bathtub and on shower floors.
- Improve the lighting in your home. As you get older, you need brighter lights to see well. Hang light-weight curtains or shades to reduce glare.
- Have handrails and lights put in on all staircases.
- Wear shoes both inside and outside the house. Avoid going barefoot or wearing slippers.

http://www.cdc.gov/ncipc/pub-res/toolkit/Falls_ToolKit/
Available programs

• Health Promotion and Disease Prevention for Older Adults
  [http://www.asaging.org/cdc/index.cfm](http://www.asaging.org/cdc/index.cfm)
  
  This web site provides professionals with free strategies and materials to enhance the capacity of national, state and local organizations in serving the health promotion and disease prevention needs of older adults.

• Exercise for Life! is a complete physical activity program that includes:
  • Chair-based strength and stretching exercises for the upper and lower body & balance exercises.