Tai Chi for Prevention of Falls in Older Adults

Yolanda Suarez, DO
Geriatrics Fellow
University of Reno School of Medicine
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Through this interactive presentation you will learn to:

- Identify fall risks in older adults using risk assessment tools
- Develop a plan to reduce risks of falls in older adults
- Talk about the origins and types of Tai Chi
- Discuss the benefits of Tai Chi for falls prevention in older adults
Mrs. W. is a 75 year old female

- Lives alone
- Uses a cane when walking
- 2 falls in past year and fractured right wrist
- Sedentary

**PMHx:**

- HTN
- Arthritis
- Depression
- Hyperlipidemia

**Medications:**

- Hydrochlorothiazide 25 mg daily
- Paroxetine 40 mg daily
- Naproxyn 500mg twice daily
- Simvastatin 80mg daily
What is the single most predictive risk factor for a fall?

a) Orthostatic Hypotension
b) Dementia
c) Diuretics
d) Prior Fall
e) Arthritis
Physical Exam

- Gait is slow and slightly unsteady
- Requires use of both arms to push out of chair
- Dizziness when standing
- Impaired Balance

Labs:

- Vitamin D: 18 ng/mL
- TSH: 10.2 mU/L
- FT4: 0.6 ng/dL

Blood Pressure  | Weight  | Height  | BMI
Seated: 110/70  | 103 lb  | 5 ft 3 in | 18.24
Standing: 95/60
## Risk Factors for Falls in Older Adults

<table>
<thead>
<tr>
<th>Potentially Modifiable</th>
<th>Neurologic</th>
<th>Psychological</th>
<th>Sensory Impairment</th>
<th>Other</th>
<th>Nonmodifiable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiac</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Age &gt;80 years</td>
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<tr>
<td>Congestive Heart Failure</td>
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<td>Arthritis</td>
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<td>Cardiac arrythmias</td>
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<td>Dementia</td>
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<td>Hypertension</td>
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<td>Female Sex</td>
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<tr>
<td><strong>Environmental Hazards</strong></td>
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<td></td>
<td></td>
<td></td>
<td>History of CVA</td>
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<tr>
<td>Medications</td>
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<td>Psychological</td>
<td>Sensory Impairment</td>
<td>Other</td>
<td>History of falling</td>
</tr>
<tr>
<td>Metabolic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>History of fractures</td>
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<tr>
<td>Diabetes</td>
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<td>Other</td>
<td>Recent hospital discharge</td>
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<tr>
<td>Low Body Mass Index</td>
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<td>Psychological</td>
<td>Sensory Impairment</td>
<td>Other</td>
<td>White Race</td>
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<tr>
<td>Vitamin D Deficiency</td>
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<td>Psychological</td>
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<td>Lower Extremity Weakness</td>
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<td>Need for assistive device</td>
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<td>Psychological</td>
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</tr>
</tbody>
</table>

- **Potentially Modifiable**
  - Cardiac
  - Environmental Hazards
  - Medications
  - Metabolic
  - Musculoskeletal
- **Neurologic**
  - Delirium
  - Dizziness or vertigo
  - Movement disorders
  - Peripheral Neuropathy
- **Psychological**
  - Depression
  - Fear of Falling
- **Sensory Impairment**
  - Auditory
  - Multifocal lens
  - Visual
- **Other**
  - Acute Illness
  - Anemia
  - Cancer
  - Inappropriate Footwear
  - Nocturia
  - Obstructive Sleep Apnea
  - Postural Hypotension
  - Urinary Incontinence

- **Nonmodifiable**
  - Age >80 years
  - Arthritis
  - Dementia
  - Female Sex
  - History of CVA
  - History of falling
  - History of fractures
  - Recent hospital discharge
  - White Race
STEADI
Fall Risk Assessment Tool
## Fall Risk Self Assessment

### Check Your Risk for Falling

<table>
<thead>
<tr>
<th>Circle “Yes” or “No” for each statement below</th>
<th>Why it matters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes (2) I have fallen in the past year.</td>
<td>People who have fallen once are likely to fall again.</td>
</tr>
<tr>
<td>Yes (2) I use or have been advised to use a cane or walker to get around safely.</td>
<td>People who have been advised to use a cane or walker may already be more likely to fall.</td>
</tr>
<tr>
<td>Yes (1) Sometimes I feel unsteady when I am walking.</td>
<td>Unsteadiness or needing support while walking are signs of poor balance.</td>
</tr>
<tr>
<td>Yes (1) I steady myself by holding onto furniture when walking at home.</td>
<td>This is also a sign of poor balance.</td>
</tr>
<tr>
<td>Yes (1) I am worried about falling.</td>
<td>People who are worried about falling are more likely to fall.</td>
</tr>
<tr>
<td>Yes (1) I need to push with my hands to stand up from a chair.</td>
<td>This is a sign of weak leg muscles, a major reason for falling.</td>
</tr>
<tr>
<td>Yes (1) I have some trouble stepping up onto a curb.</td>
<td>This is also a sign of weak leg muscles.</td>
</tr>
<tr>
<td>Yes (1) I often have to rush to the toilet.</td>
<td>Rushing to the bathroom, especially at night, increases your chance of falling.</td>
</tr>
<tr>
<td>Yes (1) I have lost some feeling in my feet.</td>
<td>Numbness in your feet can cause stumbles and lead to falls.</td>
</tr>
<tr>
<td>Yes (1) I take medicine that sometimes makes me feel light-headed or more tired than usual.</td>
<td>Side effects from medicines can sometimes increase your chance of falling.</td>
</tr>
<tr>
<td>Yes (1) I take medicine to help me sleep or improve my mood.</td>
<td>These medicines can sometimes increase your chance of falling.</td>
</tr>
<tr>
<td>Yes (1) I often feel sad or depressed.</td>
<td>Symptoms of depression, such as not feeling well or feeling slowed down, are linked to falls.</td>
</tr>
</tbody>
</table>

**Total 8**

Add up the number of points for each “yes” answer. If you scored 4 points or more, you may be at risk for falling. Discuss this brochure with your doctor.

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This checklist was developed by the Greater Los Angeles VA Geriatric Research Education Clinical Center and affiliates and is a validated fall risk self-assessment tool (Rubenstein et al. J Safety Res; 2011. 42(6):495-499). Adapted with permission of the authors.
High Risk Interventions

Conduct multifactorial risk assessment
- Review the Stay Independent brochure
- Falls history
- Physical exam, including:
  - Postural dizziness/postural hypotension
  - Medication review
  - Cognitive screening
  - Feet & footwear check
  - Use of mobility aids
  - Visual acuity check

HIGH RISK individualized fall interventions
- Educate patient
- Vitamin D +/- calcium
- Refer to PT to enhance functional mobility & improve strength & balance
- Manage & monitor hypotension
- Manage medications
- Address foot problems
- Optimize vision
- Optimize home safety
## Medications Associated with Falls

<table>
<thead>
<tr>
<th>Category</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticonvulsants</td>
<td>Laxatives</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>Opioids</td>
</tr>
<tr>
<td>Anti-hypertensives</td>
<td>Muscle Relaxants</td>
</tr>
<tr>
<td>Antiparkinsonian Drugs</td>
<td>Non-benzodiazepine, benzodiazepine receptor agonist hypnotics</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>Non-Steroidal Anti-inflammatory drugs</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>Sedatives and hypnotics</td>
</tr>
<tr>
<td>Digoxin</td>
<td></td>
</tr>
<tr>
<td>Diuretics</td>
<td></td>
</tr>
</tbody>
</table>
Which of the following can result when an older person falls?

a) Declines in functional status
b) Higher likelihood of nursing home placement
c) Increased need for medical services
d) All of the above
Blood Pressure Regulation in Older Adults

- Decline in baroreflex sensitivity
- Decreased resting cerebral perfusion
- Reduced total body water
- Lower levels of basal and stimulated renin and aldosterone
Which of the following activities reduce falls in older adults?

a) Muscle-strengthening exercises 1-2 days/week for 20-30 minutes
b) Balance training more than 3 times/week
c) Stretching 10 minutes/daily
d) Vigorous intensity activity >75 minutes/day
Interventions shown to be effective in reducing falls

a) Medication Review
b) Vitamin D supplementation
c) Use of Appropriate Footwear
d) Exercise programs that include strengthening and balance exercises like *Tai Chi*
e) All of the Above
Treatment Plan

a) Stop Hydrochlorothiazide
b) Stop paroxetine and start escitalopram and refer to a mental health specialist
c) Refer to nutritionist
d) Vitamin D 1000 units/day
e) Levothyroxine 25mcg/day
f) Prescribe a strengthening and balance exercise program
g) All of the above
Older adults tend to:

- Activate proximal muscles
- Co-contract antagonistic muscles
- Have a decline in the ability to rapidly develop joint torque
- Have declines in visual, proprioception and vestibular systems
Falls Due to Parkinson’s Disease

- Rigidity of leg musculature
- Inability to correct sway trajectory because of slowness of movement
- Hypotensive effects of medication
- Cognitive Impairment
Origins of Tai Chi

- Ancient Chinese practice
- Created as a fighting system but over time found to have health properties
- Stems from Henan Province of China
- First Tai Chi teachers came to America in the 1960’s
- Tai Chi is a type of Qigong
- The essential principles of Tai Chi are based on Taoism
- Yin and yang
Types of Tai Chi

- Chen
- Yang
- Wu
- Hao
Health Benefits of Tai Chi

- Mindfulness
- Imagery
- Structural Alignment
- Flexibility and Relaxation
- Strength and Balance
- Natural Breathing
- Social Support
- Integration of body, mind and spirit
Belief Systems

- **Qi** — an energy force thought to flow through the body; tai chi is said to unblock and encourage the proper flow of qi.

- **Yin and yang** — opposing elements thought to make up the universe that need to be kept in harmony. Tai chi is said to promote this balance.
Mechanics of Tai Chi

- Uses smooth and continuous rhythmical flow
- Teaches step position and strategies
- Enhances flexibility
- Requires whole body coordination, somatosensory awareness and balance
- Brings attention to internal as well as external coordinates in space
• Decrease in falls due to improvement in static and dynamic balance
• Decreased fear of falling
• Improvements in single leg balance and forward trunk flexion
• Improved grip strength and lower body flexibility
• Better proprioception in the ankle and knee joints in comparison to swimmers, runners and controls.
Plantar Distribution in Tai Chi Practitioners
Video--The Benefits of Tai Chi
Six Months Later....

- Gait speed increased
- Able to rise out of chair without pushing off
- Improved Balance; no need for cane
- No depression
- Tai Chi three times/week and walking five days/week

### Labs:
- Vitamin D: 30 ng/mL
- TSH: 4.1 mU/L
- T4: 1.4 ng/dL

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th>Weight</th>
<th>Height</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seated: 130/70</td>
<td>110 lb</td>
<td>5 ft 3 in</td>
<td>19.48</td>
</tr>
<tr>
<td>Standing: 125/65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The End

Thank you!

Questions?