Fall Prevention: Translating Knowledge Into Action

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Model-Building: Evidence, Elements & Evaluation

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Famous Fallers

The Fall Prevention Center of Excellence is supported by the Archstone Foundation
### Fall Incidence in Older Adults

* [rate/person/yr] or [rate/bed/yr]*

<table>
<thead>
<tr>
<th></th>
<th>Home</th>
<th>Hospital</th>
<th>Nsg Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any fall</td>
<td>0.3</td>
<td>1.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Severe fall</td>
<td>0.03 (10%)</td>
<td>0.3</td>
<td>0.35 (20%)</td>
</tr>
<tr>
<td>Fracture</td>
<td>0.01</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Hip fracture</td>
<td>0.003</td>
<td></td>
<td>0.02</td>
</tr>
</tbody>
</table>

Source: Rubenstein LZ, Josephson KR. Clin Geriatr Med. 2002(May);18(2):141-158

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Falls Mortality

- Accidents: the 5th leading cause of death in older adults
- Deaths from falls: 2/3 of accidental deaths
- 72% of U.S. fall-related deaths occur in the 13% of population age 65+

Source: Rubenstein LZ, Josephson KR. Clin Geriatr Med. 2002(May);18(2):141-158
Costs of Falls

- 8% of pop ≥ 70 visit ERs for falls yearly
- 1/3 of these are hospitalized
- 5.3% of hosp patients ≥ 65 are due to falls
- U.S. cost est. 2000 → $20 B. (2020 → $32 B)
- 42% of fallers reduce activity after fall
- 18% restricted activity initiated by falls
- Precipitate NH entry

Source: Rubenstein LZ, Josephson KR. Clin Geriatr Med. 2002(May);18(2):141-158
Risk Factors for Falls: 16 Multivariate Studies

<table>
<thead>
<tr>
<th>Factor</th>
<th>Signif/All</th>
<th>Mean RR</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weakness</td>
<td>10/11</td>
<td>4.4</td>
<td>1.5 - 10.3</td>
</tr>
<tr>
<td>Prior fall</td>
<td>12/13</td>
<td>3.0</td>
<td>1.7 - 7.0</td>
</tr>
<tr>
<td>Balance deficit</td>
<td>8/11</td>
<td>2.9</td>
<td>1.6 – 5.4</td>
</tr>
<tr>
<td>Gait deficit</td>
<td>10/12</td>
<td>2.9</td>
<td>1.3 – 5.6</td>
</tr>
<tr>
<td>Assistive device</td>
<td>8/8</td>
<td>2.6</td>
<td>1.2 – 4.6</td>
</tr>
<tr>
<td>Vision deficit</td>
<td>6/12</td>
<td>2.5</td>
<td>1.6 – 3.5</td>
</tr>
<tr>
<td>Arthritis</td>
<td>3/7</td>
<td>2.4</td>
<td>1.9 – 2.9</td>
</tr>
<tr>
<td>ADL deficit</td>
<td>8/9</td>
<td>2.3</td>
<td>1.5 – 3.1</td>
</tr>
<tr>
<td>Depression</td>
<td>3/6</td>
<td>2.2</td>
<td>1.7 – 2.3</td>
</tr>
<tr>
<td>Cognitive deficit</td>
<td>4/11</td>
<td>1.8</td>
<td>1.0 – 2.3</td>
</tr>
<tr>
<td>Age &gt; 80</td>
<td>5/8</td>
<td>1.7</td>
<td>1.1 – 2.5</td>
</tr>
</tbody>
</table>

Source: Rubenstein LZ, Josephson KR. Clin Geriatr Med. 2002(May);18(2):141-158
Drugs & Falls: Meta-Analysis

- Psychotropics, any: 1.73 (1.52-1.97)
  - Neuroleptics: 1.50 (1.25-1.79)
  - Sedative/hypnotics: 1.54 (1.40-1.70)
  - Antidepressants: 1.66 (1.40-1.95)
  - Benzodiazepines: 1.48 (1.23-1.77)
- Diuretics: 1.08 (1.02-1.16)
- Anti-arrhythmics (Ia): 1.59 (1.02-2.48)
- Digoxin: 1.22 (1.05-1.42)

Fall Incidence ↑ as Risk Factors ↑

Source: Tinetti, 1988

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Fall Prevention: Growth of RCTs

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Fall Prevention Tools

- Assessment (preventive & post-fall)
- Exercise & rehabilitation programs
- Environmental modifications
- Devices
- Nursing interventions
- Combined interventions

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Fall Prevention Trials: RAND-CMS Meta-Analysis

- Pooled reduction in fall rates (intervention vs. control)

Since the 2004 Meta-Analysis

What’s New?

• > 35 new published RCTs
• New studies of existing models:
  – Risk assessment + intervention (8), Exercise (14), Multi-factorial (8), Hip protectors (3)
• New interventions
  – Visual modifications, Vit D + Ca++, Footwear, Vibration
• Multi-factorial interventions seem best
  – RF assessment + abatement, exercise, environ mod
  – Organized, consistent, population-based programs
## Fall Prevention Strategies

### COMMUNITY
- Ask about falls
- Risk-factor screen & intervention
- Post-fall assessment
- Exercise program (strength, balance)
- Environmental inspection & modification

### INSTITUTION
- Organized program
- Risk-factor screen
- Post-fall assessment
- Nurse awareness
- Targeted interventions (e.g., hip pads, sitter, low bed, bed alarms, monitors, prompted toileting)

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Periodic case finding in Primary Care: Ask all patients about falls in past year

No falls

- No intervention

Recurrent falls

Gait/balance problems

Check for gait/balance problem

No problems

Single fall

Patient presents to medical facility after a fall

Fall Evaluation*

Assessment
- History
- Medications
- Vision
- Gait and balance
- Lower limb joints
- Neurological
- Cardiovascular

Multi-factorial intervention (as appropriate)
- Gait, balance, exercise - programs
- Medication - modification
- Postural hypotension - treatment
- Environmental hazards - modification
- Cardiovascular disorders - treatment

AGS/BGS Guideline: Assessment and Management of Falls

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Developing & Testing
“Gold Standard” Model Programs

- Increasing Stability Through Evaluation and Practice (InSTEP)
- 3 Key Components:
  - Medical-Risk Assessment & Recommendations
  - Physical Activity Program
  - Home-Risk Assessment & Modification
- Intensity: high, medium & low (2 each)
- Motivation discussion groups (1 at each intensity)
- Focusing on older adults with moderate to high fall risk

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