

## Older Adult Falls

Each year, millions of older adults age 65 years and older fall. Falls are rapid vertical deceleration due to the force of gravity and injury occurs when an individual strikes a surface at the same or lower level. Serious morbidity, including hip fractures and mortality, can occur due to falls, but can be prevented. The pattern of fall-related injury results from several factors, including the distance of the fall, type of landing surface, orientation of falling and body part that impacts first.<sup>1</sup> The injury severity is a function of the mechanical properties of tissue, the suddenness of impact, the localization of impact and the manner and amount of energy delivered.<sup>2</sup> Falls from more than 20 feet have historically been triaged to trauma centers per CDC [Guidelines for Field Triage of Injured Patients](#), but even low-level falls can cause serious head injuries and other bodily injuries.<sup>3,4</sup> A host of factors can contribute to a fall. Poor muscle tone, vision problems, medication use and sedentary lifestyle are important contributors to ground-level and stair falls and environmental components such as poor lighting and lack of handrails may increase the frequency of falling.<sup>5</sup>

The U.S. Census Bureau currently projects the baby-boom population will total 61.3 million in 2029, when the youngest boomers reach age 65. The aging of the baby boomers creates a dramatic shift in the age composition of the U.S. population. Projections of the entire older population which includes the *pre*-baby-boom cohorts born before 1946 suggest that 71.4 million people will be age 65 or older in 2029.<sup>6</sup> This means that the older adults age 65 and older will make up about 20% of the U.S. population by 2030, up from almost 14% in 2012.<sup>6,7</sup> The proportion of the total U.S. population who are age 65 and older is projected to increase from 13.1 in 2010 to 20.3 in 2030 and to 20.9 in 2050.<sup>8</sup> Falls are a major health problem among older adults. Falls lead to decreased mobility, increased risk of early death and loss of independence. Falls can also have major psychological and social consequences. Seniors may restrict their activities because of a fear of falling and a loss of self-confidence, which can lead to reduced mobility, fewer social interactions, decreased physical fitness and reduced quality of life.<sup>9,10</sup>

### How do older adult falls affect the United States?

#### *Fatal data*

- Falls are the leading cause of both fatal and non-fatal injuries for older adults age 65 years and older.
- There were 27,044 fatal falls among older adults in the U.S. in 2014; one fatal fall occurring every 20 minutes.<sup>11</sup>
- About 1,800 older adults living in nursing homes die each year from fall-related injuries.<sup>12</sup>
- From 1999 to 2014, the number of fatal falls among older adults in the U.S. increased by 167.8% from 10,097 to 27,044. Over the same 16-year period, the fall death rate for older adults increased 101.7% from 29.0 to 58.5 per 100,000 population.<sup>11</sup>
- More women age 65 and older die from falls compared to men of the same age, although men die at a higher rate higher than women.<sup>11</sup>
- Fall fatality rates differ by race and ethnicity: older whites are 2.9 times more likely to die from a fall compared to black counterparts and non-Hispanics have higher rates than Hispanics.<sup>11</sup>

#### *Non-fatal data*

- Falls can cause moderate to severe injuries, including hip fractures and head traumas.
- In 2014, 1.9 million non-fatal falls among older adults were treated in emergency departments (ED) and more than 741,600 of these injuries resulted in hospitalizations.<sup>11</sup>
- There are more than 258,000 hip fractures each year. The rate for women is almost twice the rate for men and white women have significantly higher hip fracture rates compared to black women.<sup>13</sup>
- By 2030, the number of hip fractures is projected to reach 289,000, an increase of 12% from 2010.<sup>14</sup>
- The number of hip fractures among men is projected to increase 51.8 % while the number among women is projected to decrease 3.5 %.<sup>14</sup>
- Older adults living in nursing homes who fall frequently sustain injuries that result in permanent disability and reduced quality of life. About 10-20% of nursing home falls cause serious injuries and 2-6% cause fractures.<sup>12</sup>

- Muscle weakness and walking or gait problems are the most common causes of falls among nursing home residents, accounting for approximately 24% of the falls in nursing homes.<sup>12</sup>

#### *Cost data*

- In 2013, the direct medical costs of falls, adjusted for inflation, totaled \$34 billion.<sup>15</sup>
- By 2020, the annual direct and indirect cost of fall injuries is expected to reach \$67.7 billion.<sup>15</sup>
- Fall-related injury is one of the 20 most expensive medical conditions among community-dwelling older adults.<sup>16</sup>

#### **How do older adult falls affect Indiana?**

- Falls are the leading cause of injury-related ED visits, hospitalization and death for Hoosiers age 65 and older. In 2014, 335 older adults died from fall-related injury, which is a 85.1% increase from 181 fall-related deaths in 1999.<sup>11</sup>
- There were 4,150 fatal falls among older adults in Indiana from 1999 to 2014, for a rate of 31.9 fatal falls per 100,000 population for the 16-year period.<sup>11</sup>
- The rate of fatal falls among older adults increased by 47.7% from 24.1 deaths per 100,000 population in 1999 to 35.6 per 100,000 in 2013.<sup>11</sup>
- In 2014, there were nearly 35,000 fall-related ED visits among older adults and 67.9% of these visits were among women.
- On average, an older adult falls every 15 minutes resulting in a fall-related ED visit.
- More than 14 older adult women fall per day resulting in a fall-related hospitalization.
- In 2014, there were more than 5,700 hip fracture hospitalizations among older adults and 70.9% of these hospitalizations were among women.
- Fall fatalities among older adults result in \$52.2 million medical and work loss costs in 2013.<sup>11</sup>

#### **How do we address this problem?**

##### **Policy:**

- The **Division of Aging** was created as Indiana's State Unit on Aging in accordance with the Older Americans Act (OAA) and is part of the Family and Social Services Administration. By Indiana statute IC 12-9.1-1-1, the division is granted the legal authority to establish and monitor programs that serve the needs of Indiana seniors. In addition, FSSA's Division of Aging proactively carries out a wide range of functions designed to enhance comprehensive and coordinated community-based systems serving areas throughout Indiana through the following methods: (1) Advocacy; (2) Brokering of services; (3) Coordination; (4) Information sharing; (5) Interagency linkages; (6) Monitoring and evaluation; (7) Planning; and (8) Protective services.
- The American College of Surgeons (ACS) Committee on Trauma supports efforts to promote, enact and sustain policies and legislation that:
  1. Encourage older adult care providers to implement comprehensive fall prevention programming to:
    - Develop community partnerships with community-based centers;
    - Incorporate evidence-based exercise and physical therapy fall prevention program;
    - Collaborate with home-based visiting programs to complete multi-factorial risk assessments that include medication review, assessment of vision, home safety and balance and gait and consideration of vitamin D supplementation.
  2. Collaboration with statewide and regional fall prevention coalitions for local networking and resources.
  3. Assess the risk and benefit of anti-platelet and anticoagulation therapies in older adult patients.
  4. Assess the risk of falls in regular practice.<sup>17</sup>

##### **Data collection:**

- The ISDH Division of Trauma and Injury Prevention conducts statewide injury surveillance of older adult falls through death certificates, hospitalizations and ED visits. The **Indiana Trauma Registry** is a repository into which

statewide trauma data has been brought together. Traumatic injuries due to falls are captured in the Indiana Trauma Registry.

- Statewide direction and focus for older adult falls prevention is one of the priority areas outlined in the **Indiana Trauma and Injury Prevention State Plan**.

### Interventions:

- The **Centers for Disease Control and Prevention (CDC) STEADI** (Stopping Elderly Accidents, Deaths, and Injuries) tool kit was created with healthcare provider input and describes a physician-delegated approach to incorporating fall prevention in clinical settings. It provides a simple algorithm for screening, assessments, treatment and follow-up based on the American Geriatric Society's clinical practice guidelines.
- **STEADI Phase One** includes three steps a provider can complete in one visit:
  1. ASK patients if they've fallen in the past year, feel unsteady, or worry about falling.
  2. REVIEW medications and stop, switch, or reduce the dosage of drugs that increase fall risk.
  3. RECOMMEND Vitamin D supplements of at least 800 IU/day with calcium.
    - Website: <http://www.cdc.gov/steady/index.html>.
- The **U.S. Preventive Services Task Force** recommends exercise or physical therapy and vitamin D supplements to prevent falls among community-dwelling older adults who are at increased fall-risk.<sup>18</sup>
- The **National Institute on Aging** interventions for the prevention of falls include exercise for balance and strength, monitoring for home and environmental hazards, regular medical services to ensure optimum vision and hearing and medication management.<sup>19</sup>
- CDC Compendium of Effective Fall Interventions: What works for Community-Dwelling Older Adults, third edition, provides public health organizations and aging services providers with the information to identify effective fall interventions that are most appropriate for their particular needs, resources and population. This 3rd edition describes single interventions (15 exercise interventions, four home modification interventions, 10 clinical interventions) and 12 multifaceted interventions (which address multiple risk factors):
  1. **Exercise:**
    - Stay Safe, Stay Active Barnett, et al. (2003)
    - The Otago Exercise Program Campbell, et al. and Robertson, et al.
    - LiFE (Lifestyle approach to reducing Falls through Exercise) Clemson, et al. (2012)
    - Erlangen Fitness Intervention Freiburger, et al. (2007)
    - Senior Fitness and Prevention (SEFIP) Kemmler, et al. (2010)
    - Adapted Physical Activity Program Kovacs, et al. (2013)
    - Tai Chi: Moving for Better Balance Li, et al. (2005)
    - Australian Group Exercise Program Lord, et al. (2003)
    - Yaktrax® Walker McKiernan (2005)
    - Veterans Affairs Group Exercise Program Rubenstein, et al. (2000)
    - Falls Management Exercise (FaME) Intervention Skelton, et al. (2005)
    - Music-Based Multitask Exercise Program Trombetti, et al. (2011)
    - Central Sydney Tai Chi Trial Voukelatos, et al. (2007)
    - Simplified Tai Chi Wolf, et al. (1996)
    - Multi-target Stepping Program Yamada, et al. (2013)
  2. **Home Modification Interventions**
    - The VIP Trial Campbell, et al. (2005)
    - Home Visits by an Occupational Therapist Cumming, et al. (1999)
    - Falls-HIT (Home Intervention Team) Program Nikolaus, et al. (2003)
    - Home Assessment and Modification Pighills, et al. (2011)
  3. **Clinical**
    - Three-Year Study of Vitamin D (Cholecalciferol) Plus Calcium Bischoff-Ferrari, et al. (2006)
    - Psychotropic Medication Withdrawal Campbell, et al. (1999)
    - Active Vitamin D (Calcitriol) as a Falls Intervention Gallagher, et al. (2007)

- VISIBLE (Visual Intervention Strategy Incorporating Bifocal and Long-distance Eyewear) Study Haran, et al. (2010)
- Vitamin D to Prevent Falls After Hip Fracture Harwood, et al. (2004)
- Cataract Surgery Harwood, et al. (2006)
- Pacemaker Surgery Kenny, et al. (2001)
- Study of 1000 IU Vitamin D Daily for One Year Pfeifer, et al. (2009)
- Quality Use of Medicines Program Pit, et al. (2007)
- Podiatry & Exercise Intervention Spink, et al. (2011)

#### 4. **Multifaceted Interventions**

- Stepping On Clemson, et al. (2004)
  - PROFET (Prevention of Falls in the Elderly Trial) Close, et al. (1999)
  - Accident & Emergency Fallers Davison, et al. (2005)
  - The NoFalls Intervention Day, et al. (2002)
  - The SAFE Health Behavior and Exercise Intervention Hornbrook, et al. (1994)
  - Falls Team Prevention Program Logan, et al. (2010)
  - KAAOS (Falls and Osteoporosis Clinic Palvanen, et al. (2014)
  - Multifactorial Fall Prevention Program Salminen, et al. (2009)
  - Nijmegen Falls Prevention Program (NFPP) for adults with Osteoporosis Smulders, et al. (2010)
  - The Winchester Falls Project Spice, et al. (2009)
  - Yale FCSIT (Frailty and Injuries: Cooperative Studies of Intervention Techniques) Tinetti, et al. (1994)
  - A Multifactorial Program Wagner, et al. (1994)
- CDC's *Preventing Falls: A Guide to Implementing Effective Community-Based Fall Prevention Programs* provides organizations with the building blocks to implement effective fall prevention programs. Website: [http://www.cdc.gov/HomeandRecreationalSafety/Falls/community\\_preventfalls.html](http://www.cdc.gov/HomeandRecreationalSafety/Falls/community_preventfalls.html)
  - CICOA Aging & In-Home Solutions Guide: A Resource for Seniors, People with Disabilities and Family Caregivers 2015-2016 Edition. Website: <http://cicoa.org/solutions-guide/>.

#### **Collaborations:**

- **Outreach Services of Indiana** is a project of the Family and Social Services Administration (FSSA). Outreach provides staff training, technical assistance, consultation and backup service provision throughout Indiana to improve the life and support individuals with developmental disabilities and their families, service providers and case managers. Adults and children who live in Indiana and have an intellectual or developmental disability qualify for Outreach Services at no cost. Anyone including a family member can refer someone to Outreach Services.
- **Indiana Fall Prevention Coalition** is part of the Falls Free Initiative, a national collaborative effort led by the National Council on Aging, to educate the public and support and expand evidence-based programs and interventions that help communities, states, federal agencies, nonprofits, businesses and older adults and their families prevent falls.

#### **Programs:**

- The ISDH Health Care Quality Resource Center's **Falls Prevention Resource Center** is aimed towards preventing falls in health care facilities providing care for patients and residents. Website: <http://www.state.in.us/isdh/25376.htm>.
- The Indiana Family and Social Services Administration's **Division of Disability and Rehabilitative Services** (DDRS) works to provide continuous support and life-long commitment for citizens in need of disability and rehabilitative supports in the State of Indiana. The **Bureau of Quality Improvement Services** (BQIS) monitors services to individuals by organizations and providers. BQIS is funded by or funded under the authority of the DDRS and organizations/providers that have entered into a provider agreement under [IC 12-15-11](#) to provide Medicaid in-home waiver services. Website: <http://www.in.gov/fssa/ddrs/3341.htm>.
- **Title III-D Disease Prevention and Health Promotion** services are provided through Indiana's 16 Area Agencies on Aging. Services provide information and support to older individuals with the intent to assist them in avoiding

illness and improving health status. Services are provided at multipurpose senior community centers, congregate meal sites, home-delivered meals programs, senior high-rises, retirement communities or other appropriate sites. Injury Control services available under Title II-D include education materials, sessions, or activities aimed at helping clients prevent falls and injury. These can include fall prevention exercise classes and methods of "fall proofing" the client's home. **Indiana's Area Agencies on Aging** provide case management, information and referrals to various services for persons who are aging or developmentally disabled. To apply for services, or to report suspected Medicare fraud or abuse, contact the AAA or call toll free 1-800-986-3505. Website: <http://www.in.gov/fssa/da/3478.htm>.

### Measures: Healthy People 2020:

Injury and Violence Prevention (IVP)-23: Prevent an increase in fall-related deaths.

IVP-23.1: Prevent an increase in fall-related deaths among all persons.

IVP-23.2: Prevent an increase in fall-related deaths among adults aged 65 years and older.

### Additional resources:

#### FSSA Division of Aging

Phone: 1-888-673-0002

Website: <http://www.in.gov/fssa/da/3466.htm>

#### ISDH Trauma and Injury Prevention Division

Email: [Indianatrauma@isdh.IN.gov](mailto:Indianatrauma@isdh.IN.gov)

Website: <http://www.in.gov/isdh/19537.htm>

#### Long Term Care State Ombudsman

Phone Toll Free: 1-800-622-4484 or 317-232-7134

Email: [LongTermCareOmbudsman@fssa.IN.gov](mailto:LongTermCareOmbudsman@fssa.IN.gov)

- a. ISDH Falls Prevention Resource Center: <http://www.state.in.us/isdh/25376.htm>
- b. Indiana Family and Social Services Administration, Division of Disability and Rehabilitative Services (DDRS): <http://www.in.gov/fssa/ddrs/3341.htm>
- c. Indiana Family and Social Services Administration, Quality Improvement: <http://www.in.gov/fssa/ddrs/4247.htm>
- d. Indiana Adult Protective Services (APS): State Hotline Toll Free: 1-800-992-6978
- e. CICOA Aging & In-Home Solutions: <http://cicoa.org/>
- f. CDC Compendium of Effective Fall Interventions: What Works for Community-Dwelling Older Adults, 3rd Edition: [http://www.cdc.gov/homeandrecreationalafety/pdf/CDC\\_Falls\\_Compndium-2015-a.pdf](http://www.cdc.gov/homeandrecreationalafety/pdf/CDC_Falls_Compndium-2015-a.pdf)
- g. CDC *Preventing Falls: A Guide to Implementing Effective Community-Based Fall Prevention Programs*: [http://www.cdc.gov/HomeandRecreationalSafety/Falls/community\\_preventfalls.html](http://www.cdc.gov/HomeandRecreationalSafety/Falls/community_preventfalls.html)
- h. Fall Prevention Center of Excellence: <http://www.stopfalls.org>
- i. National Center for Injury Prevention and Control, CDC: <http://www.cdc.gov/HomeandRecreationalSafety/Falls/index.html>
- j. National Council on Aging: <http://www.ncoa.org/improve-health/falls-prevention/>
- k. National Institute on Aging: <http://www.nia.nih.gov/>
- l. The State of Aging and Health in America 2013: <http://www.cdc.gov/aging/pdf/state-aging-health-in-america-2013.pdf>
- m. U.S. Department of Health and Human Services Administration on Aging: [http://www.aoa.gov/AoA\\_programs/](http://www.aoa.gov/AoA_programs/)
- n. U.S. Preventive Services Task Force Recommendations for Prevention of Falls in Community-Dwelling Older Adults: <http://annals.org/article.aspx?articleid=1305528>

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