

ConnectAmerica®

The Correlation Between Diabetes and Falls Risk



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Falls among older adults with diabetes are common and costly

Older adults managing diabetes often suffer from a number of serious complications, including retinopathy and peripheral neuropathy, which are well understood as contributing to gait instability and falls.¹ Several established risk factors for falls are more common in people with diabetes, including peripheral neuropathy, decreased physical and cognitive performance, poor vision, and increased use of antidepressant medication.²

Furthermore, older adults with diabetes have a higher risk of sustaining a fall-related injury requiring hospitalization than those without diabetes. In particular, those using insulin have three times the risk, as fractures are more common in those with diabetes using insulin.²

The estimated yearly cost of diagnosed diabetes in the U.S. is \$412.9 billion, including \$306.6 billion in direct medical costs and \$106.3 billion in indirect costs attributable to diabetes.³

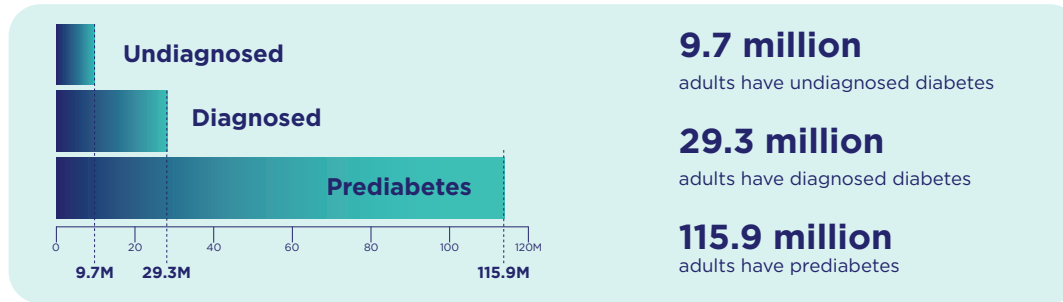
1. D'Silva L., Lin J., et al., "Impact of Diabetic Complications on Balance and Falls: Contribution of the Vestibular System," *Phys Ther* 2016 Mar;96(3):400-9. doi: 10.2522/ptj.20140604. Epub 2015 Aug 6. PMID: 26251477; PMCID: PMC4774386.

2. Yau R., Strotmeyer E, et al., "Diabetes and risk of hospitalized fall injury among older adults," *Diabetes Care* 2013 Dec;36(12):3985-91. doi: 10.2337/dc13-0429. Epub 2013 Oct 15. PMID: 24130352; PMCID: PMC3836123.

3. Parker E., Lin J., et al., "Economic Costs of Diabetes in the U.S. in 2022," *Diabetes Care* Jan 2024; 47 (1): 26-43. <https://doi.org/10.2337/dci23-0085>.

Diabetes among older adults is on the rise

According to the American Heart Association, as of 2017-2024 data, approximately 29.3 million Americans have diagnosed diabetes, another 9.7 million have undiagnosed diabetes, and 115.9 million individuals are considered to have prediabetes.⁴



Older adults with diabetes have an increased risk of falling due to a number of factors, including:

- **Diabetes complications** - poor vision, lower extremity neuropathy, and postural hypotension
- **Symptoms associated with extreme fluctuations of blood glucose**
Hypoglycemia (shakiness and blurred vision) and Hyperglycemia (weakness and blurred vision)
- **Side effects of medications**
- **Fear of falling** - leads to activity restriction causing a decline in mobility
- **Advanced Age** - decreased strength and balance
- **Home hazards** - uneven surfaces, rugs, furniture, clutter

Recognizing that there is a direct correlation between diabetic complications and increased falls risk, this educational piece focuses on diabetes-related falls risk factors, as well as falls prevention and intervention strategies specific to older adult diabetic patients.

4. Martin. et. al., "2024 Heart disease and stroke statistics: a report of U.S. and global data from the American Heart Association," Circulation. Published online January 24, 2024. doi: 10.1161/CIR.0000000000001209.

Diabetes and falls risk among older adults

Older adults with diabetes have a higher risk of falling more than once a year, especially those who take insulin. **The overall chance of falling in aging adults with Type 2 diabetes is 59% higher than that of non-diabetic older adults, and in those who take insulin, the chance of falling is 162% higher.**⁵

Diabetes causes many complications, including peripheral neuropathy and retinopathy, which are well understood as contributing to gait instability and falls, as well as nephropathy, which is the leading cause of end-stage renal disease (ESRD) in the United States, especially in the elderly.⁶

We will discuss how these sequelae can work both independently and interdependently to increase falls risk.

5. Freire L.B., Brasil-Neto, J.P., da Silva, M.L., et al., "Risk factors for falls in older adults with diabetes mellitus: systematic review and meta-analysis," *BMC Geriatr* 24, 201 (2024). <https://doi.org/10.1186/s12877-024-04668-0>.

6. Abdel-Rahman E., Alhamad T., et al., "Management of Diabetic Nephropathy in the Elderly: Special Considerations," *J Nephrol Ther.* 2012 Oct;2(5):124. PMID: 24010011; PMCID: PMC3760431.



Peripheral neuropathy is present in more than half of Type 2 diabetic patients aged 60 or older

Peripheral neuropathy (PN) is caused by nerve damage from chronically high blood glucose levels. Damaged nerves can't carry messages between the brain and other parts of the body, leading to numbness, loss of feeling, or pain in the hands, feet, and legs. People with PN may not feel pain if they cut their feet, which can lead to severe consequences like ulcers and amputation.⁷

About 60% to 70% of all people with diabetes will eventually develop peripheral neuropathy. In older adults with diabetes, PN is especially troublesome due to its detrimental effects on stability, sensorimotor function, gait, and activities of daily living. In the US, 28% of adults aged 70–79 years and 35% of adults aged ≥80 years have peripheral neuropathy.⁸

7. "Peripheral Neuropathy & Diabetes," WebMD, reviewed by M.Dansigner, MD, Sept 2023
8. Vinik A., Strotmeyer E., et al., "Diabetic neuropathy in older adults," *Clin Geriatr Med.* 2008 Aug;24(3):407-35, v. doi: 10.1016/j.cger.2008.03.011. PMID: 18672180; PMCID: PMC2706706.



Nearly 3 out of 4 diabetic patients develop retinopathy

Diabetic retinopathy (DR) is a common complication of diabetes that can lead to vision loss or impairment. It's caused by high blood glucose levels damaging the retina, the part of the eye that detects light and sends signals to the brain. **After 30 years of living with diabetes, nearly 100% of older adults develop retinopathy.**⁹

Symptoms include blurred or cloudy vision, depth perception deficits, and difficulty adjusting to shifting lighting conditions. Due to these symptoms of DR, falls in older adults represent a public health problem, particularly as the **incidence of falls can be as high as 40% in diabetic older adults.**¹⁰

9. World Health Organization, "Eyes on Diabetes," www.emro.who.int/noncommunicable-diseases/highlights/eyes-on-diabetes.html

10. Freire and Brasil-Neto, "Risk factors for falls in older adults with diabetes mellitus: systematic review and meta-analysis," *ibid.*



As many as 40% of older adult diabetics develop diabetic nephropathy

Historically known as diabetic nephropathy, chronic kidney disease (CKD) attributed to diabetes is often referred to as diabetic kidney disease (DKD) and is the major cause of CKD and end-stage kidney disease (ESKD) in those over 60 years old.¹¹

Adults aged 65 or older with CKD were at increased risk of falling and suffering an injury as a result of a fall compared with adults in the same age range without CKD.¹² In CKD patients, factors such as chronic inflammation, vitamin D deficiency, and proteinuria can contribute to muscle loss, compromising muscle strength and balance, thereby increasing the risk of falls.¹³

11. Wild, S., Roglic, G., et al., "Global Prevalence of Diabetes: Estimates for the Year 2000 and Projections for 2030," *Diabetes Care* 2004, 27, 1047-1053.

12. Kistler B., Khubchandani J., et al., "Falls and Fall-Related Injuries Among US Adults Aged 65 or Older With Chronic Kidney Disease," *Prev Chronic Dis* 2018;15:170518. DOI: <http://dx.doi.org/10.5888/pcd15.170518>.

13. Lin P., Wan B., et al., "Risk of fall in patients with chronic kidney disease: results from the China health and retirement longitudinal study," *BMC Public Health* 2004, 499 (2024). <https://doi.org/10.1186/s12889-024-17982-4>.



Strategies to help reduce falls risk in diabetic patients

Integrating these four (4) standards of practice for falls screening and prevention into your diabetic care plan can help reduce the risk of falls for older diabetics.

Step 1 – Awareness of Falls Risk and Diabetes

The findings, as mentioned earlier, highlight the danger of falling among older adults as it corresponds to three major diabetic complications. Additionally, Connect America can provide you with educational materials for your older adult diabetics and their families to explain factors that increase risk of falling and provide various approaches to mitigate falls risk.

Here are some ways to reduce the risk of falls among your older diabetics:

Awareness: Be aware of the side effects of medications, and get eyes and hearing tested.

Exercise: Balance and strength training

Home safety: Remove clutter, rugs, and cords from walkways and install stair handrails.

Footwear: Wear low-heeled shoes that fit well and provide good support.

Blood glucose: Keep blood glucose levels near target.

Fall prevention devices: Always wear your Connect America medical alert device.

Step 2 – Falls Risk Assessments

Evaluating falls risk is a recommended best practice. Commonly used assessment tools include the Timed Up and Go Test to measure functional mobility and the Functional Reach Test to measure balance.

Timed Up and Go (TUG) tests functional mobility for older adults.¹⁴

1. Have your older adult sit in an armchair.
2. Ask him/her to get out of the chair and walk 10 feet.
3. After walking 10 feet, have him/her turn around, return to the chair, and sit back down.
4. Observe him/her closely for gait and balance disturbances.
5. He/she should be able to complete the entire test in less than 20 seconds.
6. If he/she is unsteady or the test takes more than 20 seconds, refer to a physical therapist for further evaluation.
7. Refer your client to the Connect America Medical Alert Service so that he or she can signal for help quickly in the event of a fall or complication.

Functional Reach is a test to measure balance in older adults and their risk of falling.¹⁵

1. Secure a yardstick to the wall horizontally at shoulder height.
2. Mark a line on the floor about 10 inches to the right of where the yardstick begins.
3. Ask him/her to stand on the line with feet together, having his/her right shoulder nearest the wall.
4. Direct him/her to reach out along the yardstick as far as possible without losing their balance.
5. Those unable to reach more than 10 inches may be at an increased risk of falling.
6. Refer to a physical therapist for further evaluation and suggest he or she consider Connect America to get help quickly.

14. Podsiadlo D., Richardson S., "The Timed "Up and Go": A Test of Basic functional Mobility for Frail Elderly Persons," *J Amer Ger Soc* 1991, 39(2), 142-148.

15. Duncan P., et al., "Functional reach: A new clinical measure of balance," *J Gerontol.* 1990; 45:M192.

Step 3 – Self-Care Management

A self-care management plan should include education on how to get up safely from a fall.

Use this illustration to explain to your older adults the correct way to rise after falling.

How to Get Up After a Fall

A step-by-step guide detailing the correct way to get up from a fall

How to Get Help

One out of five falls causes a serious injury in older adults, such as broken bones or a head injury.^{16, 17} In the event of an emergency, Connect America lets your diabetic adults get help quickly, potentially reducing medical complications that could result from being immobile for a prolonged period.

1. Prepare



Getting up quickly or the wrong way could make an injury worse. If hurt, call for help using Connect America.



Look around for a sturdy piece of furniture or the bottom of a staircase. Don't try to stand up on your own.



Roll over onto your side by turning your head in the direction you are trying to roll, and then move your shoulders, arm, hips, and then, your leg over.

2. Rise



Push your upper body up. Lift your head and pause for a few moments to steady yourself.



Slowly get up on your hands and knees and crawl to a sturdy chair.



Place your hands on the seat of the chair and slide one foot forward so it is flat on the floor.

3. Sit



Keep the other leg bent with your knee on the floor.



From this kneeling position, slowly rise and turn your body to sit in the chair.



Sit for a few minutes before you try to do anything else.

Source: Dr. Dorothy Baker, Ph.D., RNCS, Research Scientist, Yale University School of Medicine.

16. Alexander B., Rivara F., Wolf M., "The cost and frequency of hospitalization for fall-related injuries in older adults," AM J Pub Health 1992;82(7):1020-3.

17. Sterling D., O'Connor J., Bonadies J., "Geriatric falls: injury severity is high and disproportionate to mechanism." J Trauma-Injury, Infection and Critical Care 2001;50(1):116-9.3.

Step 4 – Refer your clients to Connect America

The Connect America difference

There's a reason why over 250,000 healthcare professionals and over 7.5 million families have relied on Connect America, making us the leading provider of medical alert services in the US today.¹⁸ Connect America helps empower older adults to feel safer, confident, and independent both at home or on the go.

Easy to use

Subscribers can press their water resistant¹⁹ help button at any time to request the assistance they need—anytime, anywhere.²⁰



Technologically advanced

Our fall detection technology can automatically place a call for help if it detects a fall—even if they are unable or reluctant to press their help button.²⁰

Responsive

Connect America quickly connects them to one of our North American-based response centers to request the help they need in any situation—anytime, 24/7, 365 days a year.

Accommodating

Each subscriber decides how they would like to be helped—by a neighbor, family member, or emergency services.²¹

Referring your diabetic older adults has never been easier!



800-215-4206

Call us today to refer your diabetic adults to Connect America. A trained intake specialist will answer your call and contact your client on your behalf.



www.connectamerica.com/make-a-referral

When you activate your Connect America Referrals account, you can make referrals online.

18. Claim based on the number of subscribers.

19. Refer to IFU for more details.

20. Automatic fall detection technology does not detect 100% of falls. If able, a subscriber should always press their alert button when they need help. Button signal range could vary due to environmental factors. Coverage inside and outside the home provided where wireless network coverage is available. Recharging of the mobile pendant is done by the subscriber as needed by connecting it to its charger.

21. The Connect America response center may proceed directly to calling emergency services in urgent circumstances.

