

**FALLING**

**WHAT QUESTIONS SHOULD I AND MY FAMILY BE ASKING?**

- Have I fallen in the past year?
  - Why do I think I am falling?
  - Am I aware and awake when it happens? Or do I faint?
  - Can I describe what I was doing before and after the fall?
  - How long was I down for?
  - Was the fall witnessed by someone else or not? If so, what do they say?
  - Did I feel the room was spinning?
  - Did I feel lightheaded or have a headache?
  - Do I think there was abnormal muscle movement, slurred speech, or any confusion?
  - What new medications or changes in dose did I recently note?
  - How much alcohol am I drinking?
  - Is my home environment safe or a place that can increase my risk?
  - Do I struggle going up or downstairs?
  - Am I grabbing onto furniture or edges to walk around because of feeling a lack of balance?
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**WHAT ACTIONS CAN I TAKE FOR THIS AGENDA?**

- Exercise is the number one way to improve your strength and balance to reduce your chance of falling
- Kinds of exercises you can do include group tai chi, strength, and resistance training. These will improve your mobility and reaction time
- Decrease drinking alcohol and maintain a normal body weight
- Evidence also supports dietary calcium and vitamin D intake to improve bone mass and reduce the risk of brittle bones and injuries from falling
- Prevent falls by managing the hazards you have at homes such as slippery surfaces, unmarked edges, lack of handrails, or poor lighting
- Make sure your vision and hearing are at their best. Wear your glasses and hearing aids. See your doctor if you have eye or ear complaints

- If needed, use gait aids and make sure you are using them correctly. Speak to an occupational or physical therapist for advice
  - Use services and devices that can call for help when you can't get up. Ask your neighbors, family, or friends to check up on you from time to time
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### WHAT IS A FALL?

- A fall is an accidental change in elevation
  - You can fall from standing height or from your bed to the floor and this can cause injury
  - Seniors are more likely to fall for many reasons
  - 30% of those 65 and greater fall at least once per year and 5% of which have a serious injury
  - These numbers are much higher in nursing homes with greater injuries
  - There, half fall per year with 10-25% causing serious injury. That's because older adults in nursing homes are usually frailer
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### WHY IS FALLING A BURDEN?

- Falls are under-diagnosed due to many reasons
  - Patients may never mention the event to a healthcare provider. The provider may fail to ask the patient about a history of falls too
  - Sometimes, either the provider or patient believe that falls are a natural part of aging which is not the case
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### FALLS CAN CAUSE BLEEDING, BROKEN BONES, NEEDING TO BE IN HOSPITAL, CHANGING HOMES, OR LOSING FUNCTION

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### WHAT CAUSES FALLS TO HAPPEN?

- Falling can happen from something as simple as stumbling. But it can also be from more serious causes such as fainting, seizures, or strokes
  - There are also inside body reasons that cause falls. This can be from problems with your nervous system, diabetes, Parkinson's disease, or an abnormal heart rate. Problems with your vision and hearing are also important risks
  - As we age, our blood pressure is also less tightly controlled by our bodies so that when we stand up it can drop quickly causing us to fall
  - Studies have found that even the fear of falling increases the risk of falling
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### **HOW DOES OUR BODY BALANCE ITSELF? HOW DOES OUR BODY DEFEND ITSELF FROM FALLING?**

- Balance is a complicated system in our bodies
  - Balance is maintained by three general systems that work together. Those systems are our vision, feet sensation, and our inner ear nerves
  - As we age, these systems can become weaker or injured from disease
  - Usually, it is a combination of these balance systems that are injured that decrease our defense against falling down
  - There are balance and training programs that can help strengthen them
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### **THERE ARE MANY REASONS AS TO WHY YOU MIGHT BE FALLING. THERE ARE INNER AND OUTER BODY REASONS**

### **OUR BALANCE SYSTEM PROTECTS AGAINST FALLING BUT CAN BE INJURED OR WEAKENED AS WE AGE**

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### **WHY DOES OUR BLOOD PRESSURE DROP WHEN WE GET UP OR CHANGE POSITIONS?**

- As we age, our blood vessels don't sense or 'tighten' as well as they used to
- This can cause a drop in blood pressure when changing positions. For example from lying to sitting or sitting to standing

- This sudden drop in blood pressure can also cause one to feel lightheaded or dizzy causing a fall
  - The medical term for this is “orthostatic hypotension”
  - Ways to avoid this sudden drop and feeling is to get up, wait for a minute, then move
  - Other ways to reduce this risk is to drink enough water every day, exercise, and avoid alcohol
  - Eating enough salts if it does not cause other health problems you might already have can also help
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### **IS THERE TREATMENT FOR FALLING? HOW CAN I REDUCE MY RISK OF HAVING A FALL?**

- Usually, more than one cause exists that causes falling
  - A key part of your health is finding out what your fall risks are and trying to prevent or at least lessen them as much as possible
  - Studies have found that an assessment with many treatments to reduce these risks decreases your rate and risk of falls
  - Examples of treatments that can help reduce falls are:
  - Getting a thorough assessment by your family doctor or geriatric medicine doctor for your falls
  - Decreasing the medications that cause falls such as those that cause drowsiness or lower blood pressure
  - Exercise and improving balance
  - Using correct gait aids if needed
  - Having a home assessment for risks
  - Treating vision and hearing impairments
  - Treating and controlling long-term (chronic) diseases that affect our nervous system such as diabetes or Parkinson’s disease
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**AVOID FEELING DIZZY AND DROPPING YOUR BLOOD PRESSURE BY SITTING UP AND STANDING UP SLOWLY, WAITING FOR A MINUTE, THEN MOVING**

### WHAT MEDICATIONS INCREASE MY RISK OF FALLS?

- Many medications can do so but the main ones to be aware of are those that lower blood pressure. Especially the class of drugs known as “Beta Blockers.” Examples are Bisoprolol (Zebeta) and Metoprolol (Lopressor)
- Medications that cause sedation from the class of “Benzodiazepines” are well known to increase the risk of falls as well. Examples are Lorazepam (Ativan) and Alprazolam (Xanax)
- Even sleeping pills such as Zopiclone (Imovane) can make you more sedated in the daytime and increase your risk for falls
- Medications that relax our muscles and nerves such as from the class of drugs known as “Anticholinergics” are also known to worsen falls especially in older adults. Many medicines have some “anticholinergic” effect so ask your prescriber about them
- There is some evidence that the antidepressant medications from the class of “SSRI” can also cause falls although it is a small increase in risk
- Alcohol intake, especially in high amounts, also increases the risk of falling and is an important substance to reduce as well

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### SHOULD I STOP TAKING MY BLOOD THINNER BECAUSE I AM FALLING?

- This is a difficult question to answer and it depends on the risk of bleeding versus fall injury for each patient
  - Overall, it is rarely the case where one needs to stop their blood thinner because they are falling
  - Meaning, studies have found that the risk of having problems from stopping your blood thinner is greater than the risk of falling and bleeding if you were to take them
  - Again, this needs to be assessed on a patient by patient basis
  - We encourage you to talk to your doctor before making any changes
  - Stopping a blood thinner when it is needed can be very dangerous if it is essential. Depending on why you are taking it, stopping it can increase your risk of getting a stroke
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**ALWAYS ASK YOUR DOCTOR WHAT IS RIGHT FOR YOU. YOUR MEDICATIONS MAY BE ESSENTIAL FOR YOU**

**DO NOT STOP TAKING THEM UNTIL YOU TALK TO YOUR DOCTOR FIRST**

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**SINCE I AM FALLING, SHOULD I BE TAKING VITAMIN D?**

- There is evidence showing great benefit in taking vitamin D if your vitamin D levels are low
  - Taking them helps strengthen your bones so that if you do fall you decrease the risk of them breaking (fracturing)
  - It is very important to take vitamin D especially if you have weak bones from “osteoporosis”
  - The maximum beneficial dose of vitamin D is 1000 or 2000 international units by mouth daily
  - You might also need to take calcium supplements if you are not eating enough calcium in your diet
  - Refer to the “[bone health](#)” agenda for more details
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**GETTING A THOROUGH ASSESSMENT BY A GERIATRIC MEDICINE DOCTOR, EXERCISING, AND TAKING VITAMIN D ARE GREAT WAYS TO REDUCE FALLS**

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References

1. Robert L Kane et al. Essentials of Clinical Geriatrics 8th edition (2018)
2. Jeffrey B. Halter et al. Hazzard's Geriatric Medicine and Gerontology 7th edition (2016)
3. Jayna Holroyd-Leduc et al. Evidence Based Geriatric Medicine (2012)
4. Gillespie LD, Gillespie WJ, Robertson MC, et al. Interventions for preventing falls in elderly people. Cochrane Database Syst Rev 2003;(4):CD000340. Province MA, Hadley EC, Hornbrook MC, et al. The effects of exercise on falls in elderly patients. A preplanned

- meta-analysis of the FICSIT Trials. Frailty and Injuries: Cooperative Studies of Intervention Techniques. *JAMA* 1995;273:1341–7. 6
5. Gates S, Fisher JD, Cooke MW, et al. Multifactorial assessment and targeted intervention for preventing falls and injuries among older people in community and emergency care settings: systematic review and meta-analysis. *BMJ* 2008;336:130–3. 7
  6. Peel NM, McClure RJ, Hendrikz JK (2006). Health-protective behaviours and risk of fall-related hip fractures: a population-based case-control study. doi: 10.1093/ageing/af1056. *Age Ageing*, 35(5):491-497.
  7. Man-Son-Hing M, Nichol G, Lau A, Laupacis A. Choosing antithrombotic therapy for elderly patients with atrial fibrillation who are at risk for falls. *Arch Intern Med* 1999; 159:677.
  8. Bergen G, Stevens MR, Burns ER. Falls and Fall Injuries Among Adults Aged  $\geq 65$  Years - United States, 2014. *MMWR Morb Mortal Wkly Rep* 2016; 65:993.
  9. Tinetti ME. Clinical practice. Preventing falls in elderly persons. *N Engl J Med* 2003; 348:42.
  10. Rubenstein LZ, Josephson KR. The epidemiology of falls and syncope. *Clin Geriatr Med* 2002; 18:141.
  11. Chang JT, Morton SC, Rubenstein LZ, et al. Interventions for the prevention of falls in older adults: systematic review and meta-analysis of randomised clinical trials. *BMJ* 2004; 328:680.
  12. Nachreiner NM, Findorff MJ, Wyman JF, McCarthy TC. Circumstances and consequences of falls in community-dwelling older women. *J Womens Health (Larchmt)* 2007; 16:1437. Rubenstein LZ, Josephson KR. Falls and their prevention in elderly people: what does the evidence show? *Med Clin North Am* 2006; 90:807. Nickens H. Intrinsic factors in falling among the elderly. *Arch Intern Med* 1985; 145:1089.
  13. Oliver D, Connelly JB, Victor CR, et al. Strategies to prevent falls and fractures in hospitals and care homes and effect of cognitive impairment: systematic review and meta-analyses. *BMJ* 2007; 334:82.
  14. Guideline for the prevention of falls in older persons. American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention. *J Am Geriatr Soc* 2001; 49:664
  15. Tinetti ME, Williams CS. Falls, injuries due to falls, and the risk of admission to a nursing home. *N Engl J Med* 1997; 337:1279.
  16. Tinetti ME, Mendes de Leon CF, Doucette JT, Baker DI. Fear of falling and fall-related efficacy in relationship to functioning among community-living elders. *J Gerontol* 1994; 49:M140.
  17. Gill TM, Murphy TE, Gahbauer EA, Allore HG. Association of injurious falls with disability outcomes and nursing home admissions in community-living older persons. *Am J Epidemiol* 2013; 178:418.

18. Vieira ER, Palmer RC, Chaves PH. Prevention of falls in older people living in the community. *BMJ* 2016; 353:i1419
19. Tinetti ME, Liu WL, Claus EB. Predictors and prognosis of inability to get up after falls among elderly persons. *JAMA* 1993; 269:65.
20. Sattin RW. Falls among older persons: a public health perspective. *Annu Rev Public Health* 1992; 13:489.
21. Centers for Disease Control and Prevention (CDC). Fatalities and injuries from falls among older adults--United States, 1993-2003 and 2001-2005. *MMWR Morb Mortal Wkly Rep* 2006; 55:1221.
22. Florence CS, Bergen G, Atherly A, et al. Medical Costs of Fatal and Nonfatal Falls in Older Adults. *J Am Geriatr Soc* 2018; 66:693.
23. Austin N, Devine A, Dick I, et al. Fear of falling in older women: a longitudinal study of incidence, persistence, and predictors. *J Am Geriatr Soc* 2007; 55:1598.
24. Deshpande N, Metter EJ, Lauretani F, et al. Activity restriction induced by fear of falling and objective and subjective measures of physical function: a prospective cohort study. *J Am Geriatr Soc* 2008; 56:615.
25. Visschedijk J, Achterberg W, Van Balen R, Hertogh C. Fear of falling after hip fracture: a systematic review of measurement instruments, prevalence, interventions, and related factors. *J Am Geriatr Soc* 2010; 58:1739.
26. Speechley M, Tinetti M. Falls and injuries in frail and vigorous community elderly persons. *J Am Geriatr Soc* 1991; 39:46.
27. Graafmans WC, Ooms ME, Hofstee HM, et al. Falls in the elderly: a prospective study of risk factors and risk profiles. *Am J Epidemiol* 1996; 143:1129.
28. Campbell AJ, Borrie MJ, Spears GF. Risk factors for falls in a community-based prospective study of people 70 years and older. *J Gerontol* 1989; 44:M112.
29. Nevitt MC, Cummings SR, Kidd S, Black D. Risk factors for recurrent nonsyncopal falls. A prospective study. *JAMA* 1989; 261:2663.
30. O'Loughlin JL, Robitaille Y, Boivin JF, Suissa S. Incidence of and risk factors for falls and injurious falls among the community-dwelling elderly. *Am J Epidemiol* 1993; 137:342.
31. Bueno-Cavanillas A, Padilla-Ruiz F, Jiménez-Moleón JJ, et al. Risk factors in falls among the elderly according to extrinsic and intrinsic precipitating causes. *Eur J Epidemiol* 2000; 16:849.
32. Bergland A, Jarnlo GB, Laake K. Predictors of falls in the elderly by location. *Aging Clin Exp Res* 2003; 15:43.
33. O'Loughlin JL, Boivin JF, Robitaille Y, Suissa S. Falls among the elderly: distinguishing indoor and outdoor risk factors in Canada. *J Epidemiol Community Health* 1994; 48:488.
34. Mahoney JE, Palta M, Johnson J, et al. Temporal association between hospitalization and rate of falls after discharge. *Arch Intern Med* 2000; 160:2788.



35. Richardson JK, Hurvitz EA. Peripheral neuropathy: a true risk factor for falls. *J Gerontol A Biol Sci Med Sci* 1995; 50:M211.
36. Alexander NB. Postural control in older adults. *J Am Geriatr Soc* 1994; 42:93.
37. Viljanen A, Kaprio J, Pyykkö I, et al. Hearing as a predictor of falls and postural balance in older female twins. *J Gerontol A Biol Sci Med Sci* 2009; 64:312.
38. Jiam NT, Li C, Agrawal Y. Hearing loss and falls: A systematic review and meta-analysis. *Laryngoscope* 2016; 126:2587.
39. Woollacott MH, Shumway-Cook A, Nashner LM. Aging and posture control: changes in sensory organization and muscular coordination. *Int J Aging Hum Dev* 1986; 23:97.
40. Maki BE, McIlroy WE. Postural control in the older adult. *Clin Geriatr Med* 1996; 12:635
41. Lord SR, Dayhew J. Visual risk factors for falls in older people. *J Am Geriatr Soc* 2001; 49:508.
42. Yip JL, Khawaja AP, Broadway D, et al. Visual acuity, self-reported vision and falls in the EPIC-Norfolk Eye study. *Br J Ophthalmol* 2014; 98:377.
43. Crews JE, DPA, Chou CF, et al. Falls Among Persons Aged  $\geq 65$  Years With and Without Severe Vision Impairment - United States, 2014. *MMWR Morb Mortal Wkly Rep* 2016; 65:433.
44. Berry SD, Samelson EJ, Hannan MT, et al. Second hip fracture in older men and women: the Framingham Study. *Arch Intern Med* 2007; 167:1971.
45. Kario K, Tobin JN, Wolfson LI, et al. Lower standing systolic blood pressure as a predictor of falls in the elderly: a community-based prospective study. *J Am Coll Cardiol* 2001; 38:246.
46. Leveille SG, Jones RN, Kiely DK, et al. Chronic musculoskeletal pain and the occurrence of falls in an older population. *JAMA* 2009; 302:2214.
47. Woolcott JC, Richardson KJ, Wiens MO, et al. Meta-analysis of the impact of 9 medication classes on falls in elderly persons. *Arch Intern Med* 2009; 169:1952.
48. Ray WA, Griffin MR, Downey W. Benzodiazepines of long and short elimination half-life and the risk of hip fracture. *JAMA* 1989; 262:3303.
49. Ensrud KE, Blackwell TL, Mangione CM, et al. Central nervous system-active medications and risk for falls in older women. *J Am Geriatr Soc* 2002; 50:1629.
50. Cumming RG. Epidemiology of medication-related falls and fractures in the elderly. *Drugs Aging* 1998; 12:43.
51. Tamblyn R, Abrahamowicz M, du Berger R, et al. A 5-year prospective assessment of the risk associated with individual benzodiazepines and doses in new elderly users. *J Am Geriatr Soc* 2005; 53:233.
52. Wagner AK, Ross-Degnan D, Gurwitz JH, et al. Effect of New York State regulatory action on benzodiazepine prescribing and hip fracture rates. *Ann Intern Med* 2007; 146:96.

53. Thapa PB, Gideon P, Cost TW, et al. Antidepressants and the risk of falls among nursing home residents. *N Engl J Med* 1998; 339:875. Richards JB, Papaioannou A, Adachi JD, et al. Effect of selective serotonin reuptake inhibitors on the risk of fracture. *Arch Intern Med* 2007; 167:188. Province MA, Hadley EC, Hornbrook MC, et al. The effects of exercise on falls in elderly patients. A preplanned meta-analysis of the FICSIT Trials. *Frailty and Injuries: Cooperative Studies of Intervention Techniques*. *JAMA* 1995; 273:1341-397.
54. Stevens M, Holman CD, Bennett N, de Klerk N. Preventing falls in older people: outcome evaluation of a randomized controlled trial. *J Am Geriatr Soc* 2001; 49:1448.
55. Visser M, Deeg DJ, Lips P, Longitudinal Aging Study Amsterdam. Low vitamin D and high parathyroid hormone levels as determinants of loss of muscle strength and muscle mass (sarcopenia): the Longitudinal Aging Study Amsterdam. *J Clin Endocrinol Metab* 2003; 88:5766.
56. Wicherts IS, van Schoor NM, Boeke AJ, et al. Vitamin D status predicts physical performance and its decline in older persons. *J Clin Endocrinol Metab* 2007; 92:2058.
57. Nilsson M, Eriksson J, Larsson B, et al. Fall Risk Assessment Predicts Fall-Related Injury, Hip Fracture, and Head Injury in Older Adults. *J Am Geriatr Soc* 2016; 64:2242.