

Fall Prevention in Long-Term Care

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Agenda



**Understand
the negative impact falls
can have on
older adults**



**Recognize
common risk
factors for falls including
medications**



**Identify
ways to potentially reduce
fall risk**

“It takes a child one year to acquire independent movement and ten years to acquire independent mobility. An old person can lose both in a day.”

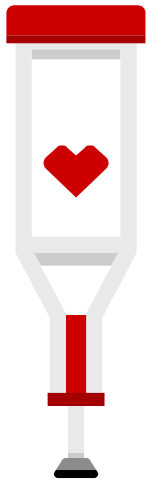
Bernard Isaacs



Duque G et al. Falls as a geriatric syndrome: Mechanisms and risk identification. In Osteoporosis in older persons: Advances in pathophysiology and therapeutic approaches. Springer International Publishing Switzerland. 2016; 171-186.

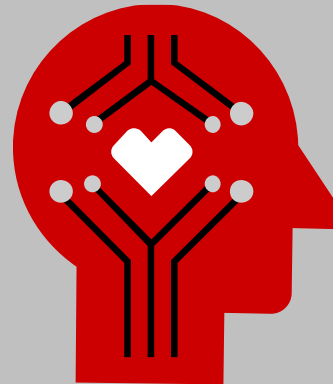
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Fractures and Broken Bones



Falls often cause fractures in the hip, wrist, upper arm, or pelvis, which may become chronic injuries

Head Injuries Including Traumatic Brain Injury



25% of fall-related traumatic brain injuries in older adults occur in long-term care facilities

Hospitalization, Disability, and Death



Falls are the leading cause of injury and injury-related deaths among adults aged 65 and older

Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>
Schonnop R et al. Prevalence of and factors associated with head impact during falls in older adults in long-term care. CMAJ. 2013; 185(17): E803-E810.

Impact of Falls

Category	Impact
Medical	<ul style="list-style-type: none">• Bleeding, bruising, cuts• Fractures• Acute and chronic pain• Death
Functional	<ul style="list-style-type: none">• Immobility• Loss of bone, muscle, and strength• Disability and dependence on others
Psychological	<ul style="list-style-type: none">• Fear of falling, anxiety• Loss of confidence• Depression
Social	<ul style="list-style-type: none">• Loss of independence• Isolation• Placement in long-term care

Duque G et al. Osteoporosis in older persons: Advances in pathophysiology and therapeutic approaches, chapter 10 falls as a geriatric syndrome: Mechanisms and risk identification. 2009.

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Quality of Life is Decreased by Falls – Case Study



KC recently had a fall and suffered a brain injury and a broken hip. Before this, she had been living in an apartment by herself. Her family reports that KC did not need help with walking, taking her medications, planning her daily activities, or managing money.

Now she has lost her confidence and independence, she must use a walker, and has trouble performing some of her ADL without assistance. She is in a nursing home, but she is frustrated by her surroundings and scared of falling again. She refuses physical and occupational therapy and help with her ADL.

How has KC's quality of life changed after her fall and related injuries?

What can be done to help her participate in her ADL and therapy?

What is the risk if she continues to refuse to participate?

ADL = activities of daily living

Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>

Centers for Medicare and Medicaid Services. Long-term care facility resident assessment instrument 3.0 user's manual. Section GG. Version 1.17.1. 2019 Oct.

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Fall Risk Factors

Common Risk Factors for Falls

Intrinsic

- Decrease in muscle strength
- Balance and coordination difficulties
- Sensory problems (e.g., pain or numbness in feet)
- Hypotension
- Poor vision
- Osteoporosis
- Vitamin D deficiency
- Movement disorders (e.g., Parkinson's disease)
- Arthritis, decreased flexibility, gait problems
- Dementia or poor decision-making skills
- Fear of falling

Most falls are caused by the interaction of multiple risk factors. The more risk factors a person has, the greater their chances of falling.

Extrinsic

- Unfamiliar surroundings*
- Environmental hazards (e.g., wet floor, uneven surfaces, clutter, lightweight/unstable furniture)
- Poor access (e.g., items not within easy access to resident)
- Insufficient lighting
- Being rushed to move or perform tasks
- Poor fitting footwear, slippery socks or soles of shoes
- Walker or assistive device not fitted properly
- Lack of handrails, or other safety measures
- Individual needs not addressed (e.g., need for high toilet or bedside commode)

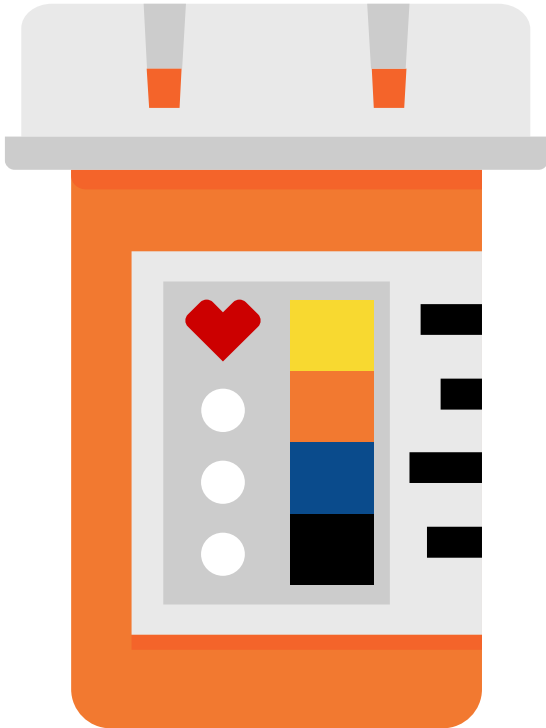
*Unfamiliar surroundings can be due to new admission or room changes (extrinsic) or due to memory concerns (intrinsic)

Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>

Duque G et al. Osteoporosis in older persons: Advances in pathophysiology and therapeutic approaches, chapter 10 falls as a geriatric syndrome: Mechanisms and risk identification. 2009.

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Medications



Any medication can potentially increase fall risk

Some medications create a higher risk for falls than others, due to their side effects (e.g., drowsiness)

Medications with fall-inducing side effects are even more dangerous in the following situations:

- In those who have already had a fall
- When a resident takes multiple medications (polypharmacy)
- When more than one fall-inducing medication is on the regimen

American Geriatrics Society 2023 updated AGS Beers Criteria. JAGS. 2023.

Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>

United States Senate Special Committee on Aging. Falls prevention: National, state, and local solutions to better support seniors. 2019.

https://www.aging.senate.gov/imo/media/doc/SCA_Falls_Report_2019.pdf

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Common Medications That Increase Risk for Falls*

Drug Class	Examples	Effects Related to Falls
Antidepressants	Tricyclic Antidepressants (TCA) amitriptyline, desipramine, doxepin, imipramine, nortriptyline	TCA may cause drowsiness, confusion, dry eyes, low blood pressure, and gait changes
	Selective Serotonin Reuptake Inhibitors (SSRI) citalopram, escitalopram, fluoxetine, paroxetine, sertraline	Paroxetine may cause drowsiness, confusion, dry eyes, low blood pressure, and gait changes
	Serotonin-Norepinephrine Reuptake Inhibitors (SNRI) desvenlafaxine, duloxetine, levomilnacipran, venlafaxine	SSRI and SNRI are associated with fragility fractures due to gait changes and impaired motor function
	Other: Auvelity (dextromethorphan/bupropion), mirtazapine, trazodone	Dizziness, drowsiness, low blood pressure

*Table not all-inclusive
Agency for Healthcare Research and Quality. The Falls Management Program: A Quality Improvement Initiative for Nursing Facilities. <https://www.ahrq.gov/patient-safety/settings/long-term-care/resource/injuries/fallspix.html>
American Geriatrics Society 2023 updated AGS Beers Criteria. JAGS. 2023.
Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steadi/materials.html>
Fritsch MA et al. Geriatric polypharmacy pharmacist as key facilitator in assessing for falls risk: 2019 update. Clin Geriatr Med. 2019; 35(2):185-204.

Common Medications That Increase Risk for Falls*

Drug Class	Examples	Effects Related to Falls
Antiseizure Medications	carbamazepine, divalproex, gabapentin, lamotrigine, levetiracetam, phenobarbital, phenytoin, pregabalin, topiramate, valproic acid, zonisamide	Decreased bone density and increased risk of fractures
Antipsychotics	aripiprazole, asenapine, Caplyta (lumateperone), clozapine, haloperidol, fluphenazine, lurasidone, olanzapine, paliperidone, quetiapine, brexpiprazole, risperidone, thioridazine, Vraylar (cariprazine), ziprasidone	Low blood pressure, sedation, and abnormal movements

*Table not all-inclusive
Agency for Healthcare Research and Quality. The Falls Management Program: A Quality Improvement Initiative for Nursing Facilities. <https://www.ahrq.gov/patient-safety/settings/long-term-care/resource/injuries/fallspx.html>
American Geriatrics Society 2023 updated AGS Beers Criteria. JAGS. 2023.
Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>
Fritsch MA et al. Geriatric polypharmacy pharmacist as key facilitator in assessing for falls risk: 2019 update. Clin Geriatr Med. 2019; 35(2):185-204.

Common Medications That Increase Risk for Falls*

Drug Class	Examples	Effects Related to Falls
Benzodiazepines	alprazolam, clonazepam, clorazepate, diazepam, lorazepam, oxazepam, temazepam, triazolam	Impaired gait, balance, and sedation. Can impair memory and judgement.
Muscle Relaxants	carisoprodol, cyclobenzaprine, metaxalone, orphenadrine	Impaired gait, balance, and sedation, limited evidence of efficacy, and highly associated with falls
Opioids	codeine, fentanyl, hydrocodone, hydromorphone, levorphanol, methadone, morphine, oxycodone, oxymorphone, tramadol	Sedation, gait changes, and confusion can lead to falls
Sedative/Hypnotics	estazolam, eszopiclone, zaleplon, zolpidem	Impaired gait, balance, and sedation. Can impair memory and judgement.

*Table not all-inclusive
Agency for Healthcare Research and Quality. The Falls Management Program: A Quality Improvement Initiative for Nursing Facilities. <https://www.ahrq.gov/patient-safety/settings/long-term-care/resource/injuries/fallspix.html>
American Geriatrics Society 2023 updated AGS Beers Criteria. JAGS. 2023.
Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>
Fritsch MA et al. Geriatric polypharmacy pharmacist as key facilitator in assessing for falls risk: 2019 update. Clin Geriatr Med. 2019; 35(2):185-204.

Common Medications That Increase Risk for Falls*

Drug Class	Examples	Effects Related to Falls
Antihistamines [†] (1st Generation)	chlorpheniramine, cyproheptadine, dimenhydrinate, diphenhydramine, doxylamine, hydroxyzine, meclizine, scopolamine	Sedation, confusion, dry eyes, vision and gait changes
Blood Pressure Medications	Beta-blockers: atenolol, carvedilol, metoprolol Calcium Channel Blockers: diltiazem, nifedipine Diuretics: hydrochlorothiazide, furosemide Other: clonidine, doxazosin, hydralazine, isosorbide, prazosin, terazosin	Low blood pressure and heart rate, sedation
Miscellaneous	benztropine, dextromethorphan/quinidine, digoxin, donepezil, levodopa, oxybutynin, trihexyphenidyl	Falls are potentially associated with toxicity (digoxin), sedation, confusion, low blood pressure, vision and gait changes

*Table not all-inclusive
† Many antihistamines are available over the counter (OTC) and are in common combination products to treat insomnia, colds, allergies, or pain
Agency for Healthcare Research and Quality. The Falls Management Program: A Quality Improvement Initiative for Nursing Facilities. <https://www.ahrq.gov/patient-safety/settings/long-term-care/resource/injuries/fallspix.html>
American Geriatrics Society 2023 updated AGS Beers Criteria. JAGS. 2023.
Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>
Fritsch MA et al. Geriatric polypharmacy pharmacist as key facilitator in assessing for falls risk: 2019 update. Clin Geriatr Med. 2019; 35(2):185-204.

Combinations of Medications can Increase Fall Risk

- Decrease the number of fall-inducing medications
- Reduce polypharmacy: drug-drug and drug-disease interaction
- Implement strategies to decrease risk:
 - Monitor resident frequently
 - Keep environment well lit and clear of trip hazards
 - Properly fitted aids and footwear



United States Senate Special Committee on Aging. Falls prevention: National, state, and local solutions to better support seniors. 2019.
https://www.aging.senate.gov/imo/media/doc/SCA_Falls_Report_2019.pdf

Modify Multiple Risk Factors to Decrease Falls – Case Study



LN takes several medications that increase fall risk such as an antihistamine (diphenhydramine) at bedtime, a diuretic in the morning and at bedtime, and lorazepam three times a day for anxiety. She often gets dizzy when she stands.

She has fallen three times this month since she was admitted to the assisted living facility. Twice at night trying to get to the bathroom, and once because she tripped on a rug she did not see. She reports feeling unsteady at times.

What are your suggestions for modifying her medications?

What intrinsic factors can we modify or monitor to reduce fall risk?

What are some environmental factors that could be increasing fall risk?

Centers for Disease Control and Prevention. Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>

Centers for Medicare and Medicaid Services. Long-term care facility resident assessment instrument 3.0 user's manual. Section GG. Version 1.18.11. 2023 Aug.

42 CFR 483, Subpart B – Requirements for Long Term Care Facilities.

National Center for Assisted Living. A conversation about falls in assisted living https://www.ahcancal.org/ncal/operations/Documents/Falls_Consumer.pdf

Fall Prevention

Individualize Each Resident's Fall Prevention Plan

Don't forget to ask the resident, family, or point of contact what they think is contributing to falls and what will help reduce them.

Centers for Medicare and Medicaid Services. Long-term care facility resident assessment instrument 3.0 user's manual. Section GG. Version 1.18.11. 2023 Oct.
Denkinger MD et al. Factors associated with fear of falling and associated activity restriction in community-dwelling older adults: A systematic review. Am. J. Geriatr. Psychiatry. 2015; 23:72–86



Stopping Elderly Accidents, Deaths, and Injuries (STEADI)

The CDC's STEADI initiative is a free resource that offers online training, resources, and tools to manage fall risk

- Screening tools
- Risk factors assessment
- Assessment of level of fall risk – each level has different recommendations



SAFE method

Strategy to screen medications

Assess patients' health

Formulate ways to stop, switch, or reduce medications to the lowest possible dose

Educate patients and caregivers about medication changes

Centers for Disease Control and Prevention (CDC). Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>

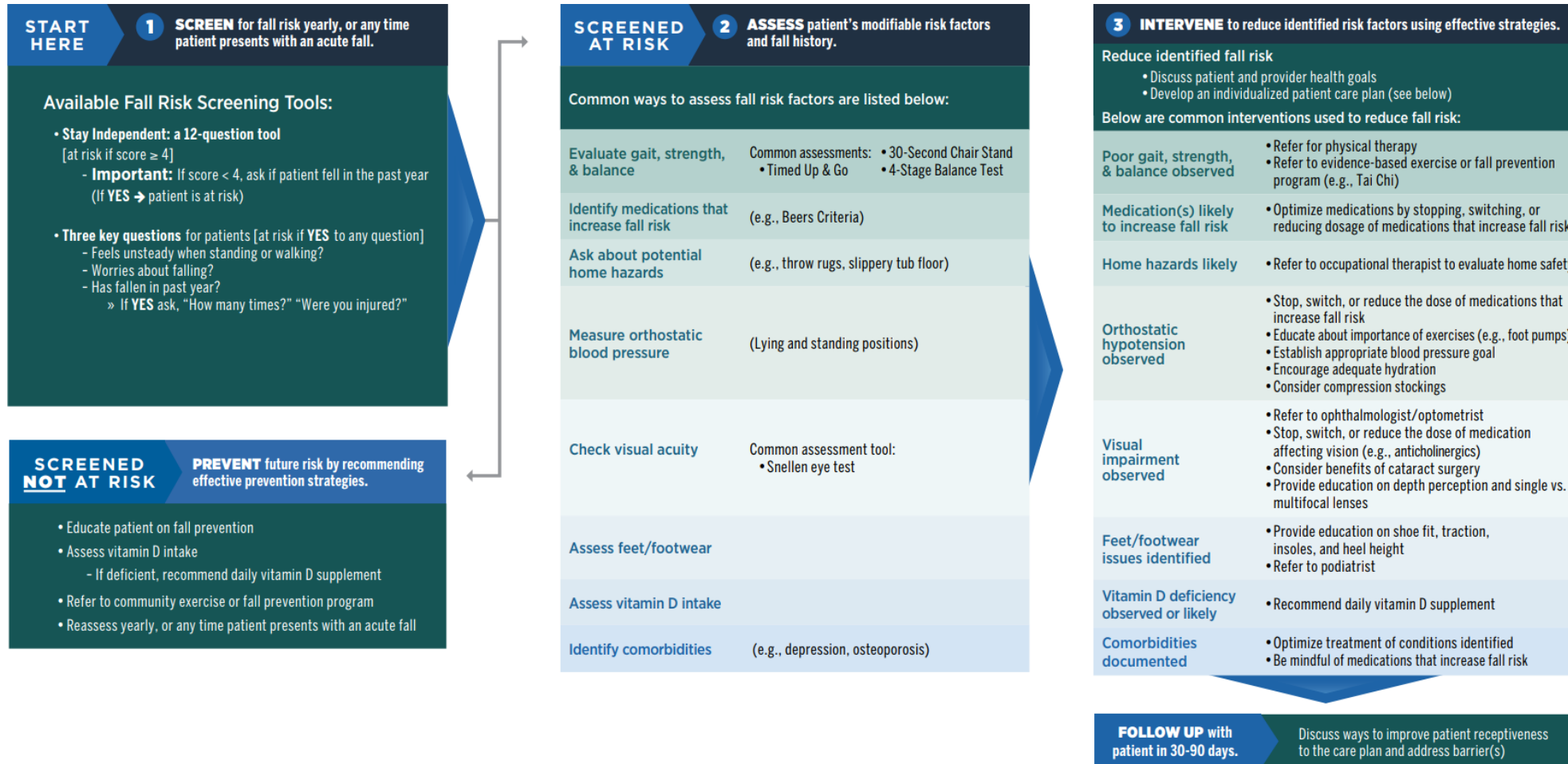
STEADI “Stay Independent” Brochure to Assess Fall Risk

Check Your Risk for Falling

Circle “Yes” or “No” for each statement below			Why it matters
Yes (2)	No (0)	I have fallen in the past year.	People who have fallen once are likely to fall again.
Yes (2)	No (0)	I use or have been advised to use a cane or walker to get around safely.	People who have been advised to use a cane or walker may already be more likely to fall.
Yes (1)	No (0)	Sometimes I feel unsteady when I am walking.	Unsteadiness or needing support while walking are signs of poor balance.
Yes (1)	No (0)	I steady myself by holding onto furniture when walking at home.	This is also a sign of poor balance.
Yes (1)	No (0)	I am worried about falling.	People who are worried about falling are more likely to fall.
Yes (1)	No (0)	I need to push with my hands to stand up from a chair.	This is a sign of weak leg muscles, a major reason for falling.
Yes (1)	No (0)	I have some trouble stepping up onto a curb.	This is also a sign of weak leg muscles.
Yes (1)	No (0)	I often have to rush to the toilet.	Rushing to the bathroom, especially at night, increases your chance of falling.
Yes (1)	No (0)	I have lost some feeling in my feet.	Numbness in your feet can cause stumbles and lead to falls.
Yes (1)	No (0)	I take medicine that sometimes makes me feel light-headed or more tired than usual.	Side effects from medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I take medicine to help me sleep or improve my mood.	These medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I often feel sad or depressed.	Symptoms of depression, such as not feeling well or feeling slowed down, are linked to falls.
Total _____		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.	

Centers for Disease Control and Prevention (CDC). Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steadi/materials.html>

STEADI Algorithm for Fall Risk Screening, Assessment, and Intervention Among Community-Dwelling Adults 65 years and older



Centers for Disease Control and Prevention (CDC). Stopping elderly accidents death and injuries (STEADI). <https://www.cdc.gov/steady/materials.html>

Suggested Actions Following a Fall

Facilities should implement a comprehensive, well-documented, resident-centered fall prevention plan for each resident who has a fall, with a history of falls, or who is at risk for falls

Proper actions following a fall include:



Assessing injuries and treating appropriately. Falls without injury are still considered falls.



Determining what caused or contributed to the fall, and what the resident was doing before the fall.



Addressing the risk factors such as the resident's medical conditions, facility environment, or staffing issues.



Revising the resident's plan of care and/or facility practices, as needed, to reduce the likelihood of another fall. Restraints are rarely appropriate.



Reporting the fall to the prescriber, family, point of contact, and facility leadership*.

*Be aware of and follow your federal, state, and facility reporting requirements
42 CFR 483, Subpart B – Requirements for Long Term Care Facilities.

Everyone Can Help Prevent Falls



Admissions

Obtain accurate history of falls, risk factors, and prior interventions



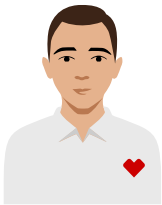
Administrator and Director of Nursing

Policies and procedures, reporting, quality assurance



Nursing and Other Front-Line Staff (e.g., CNA)

Communicate changes in gait, balance, signs of falls, problems with footwear



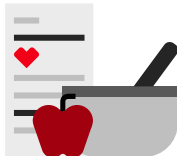
Housekeeping and Maintenance

Keeping facility clean, report uneven surfaces and hazards



Activities

Promote safe movement, falls awareness, activities that improve balance



Dietary

Communicate changes in eating or drinking habits

CNA = certified nursing assistant
Agency for Healthcare Research and Quality. The Falls Management Program: A Quality Improvement Initiative for Nursing Facilities. <https://www.ahrq.gov/patient-safety/settings/long-term-care/resource/injuries/fallspx.html>
United States Senate Special Committee on Aging. Falls prevention: National, state, and local solutions to better support seniors. 2019. https://www.aging.senate.gov/imo/media/doc/SCA_Falls_Report_2019.pdf

Take Aways



QOL = quality of life

Group Activity

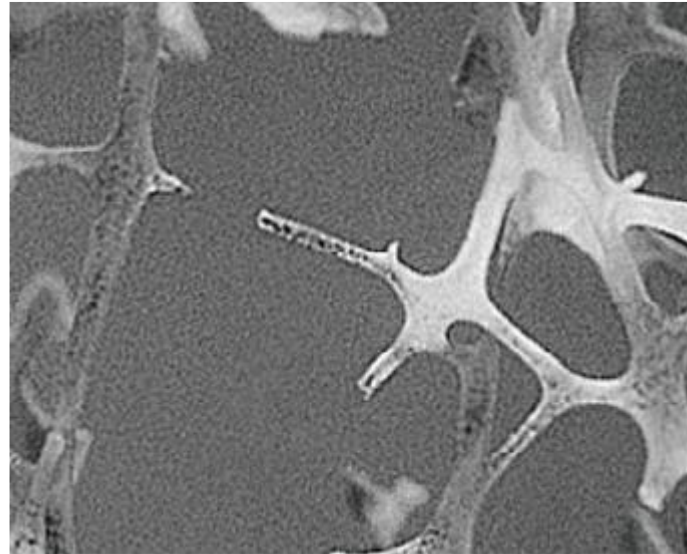
Overview of Osteoporosis

What is Osteoporosis?

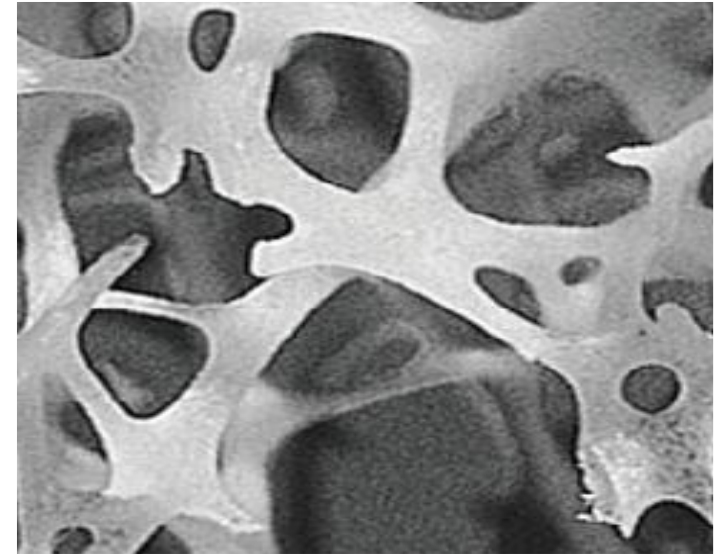
Osteoporosis is a progressive bone disease that weakens the bones and increases the risk of fractures.

- Bones lose minerals like calcium
- “Silent” disease

Bone with Osteoporosis



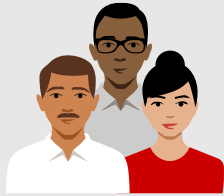
Normal Bone



NIH ORBD NRC Osteoporosis Overview October 2019.

HHS Surgeon General's Report on Bone Health and Osteoporosis December 2019.

Prevalence of Osteoporosis



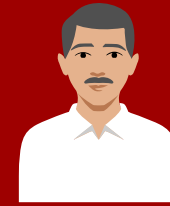
54M

Americans have
osteoporosis and
low bone mass



**1 in 2
women**

aged 50 and older
will break a bone due
to osteoporosis



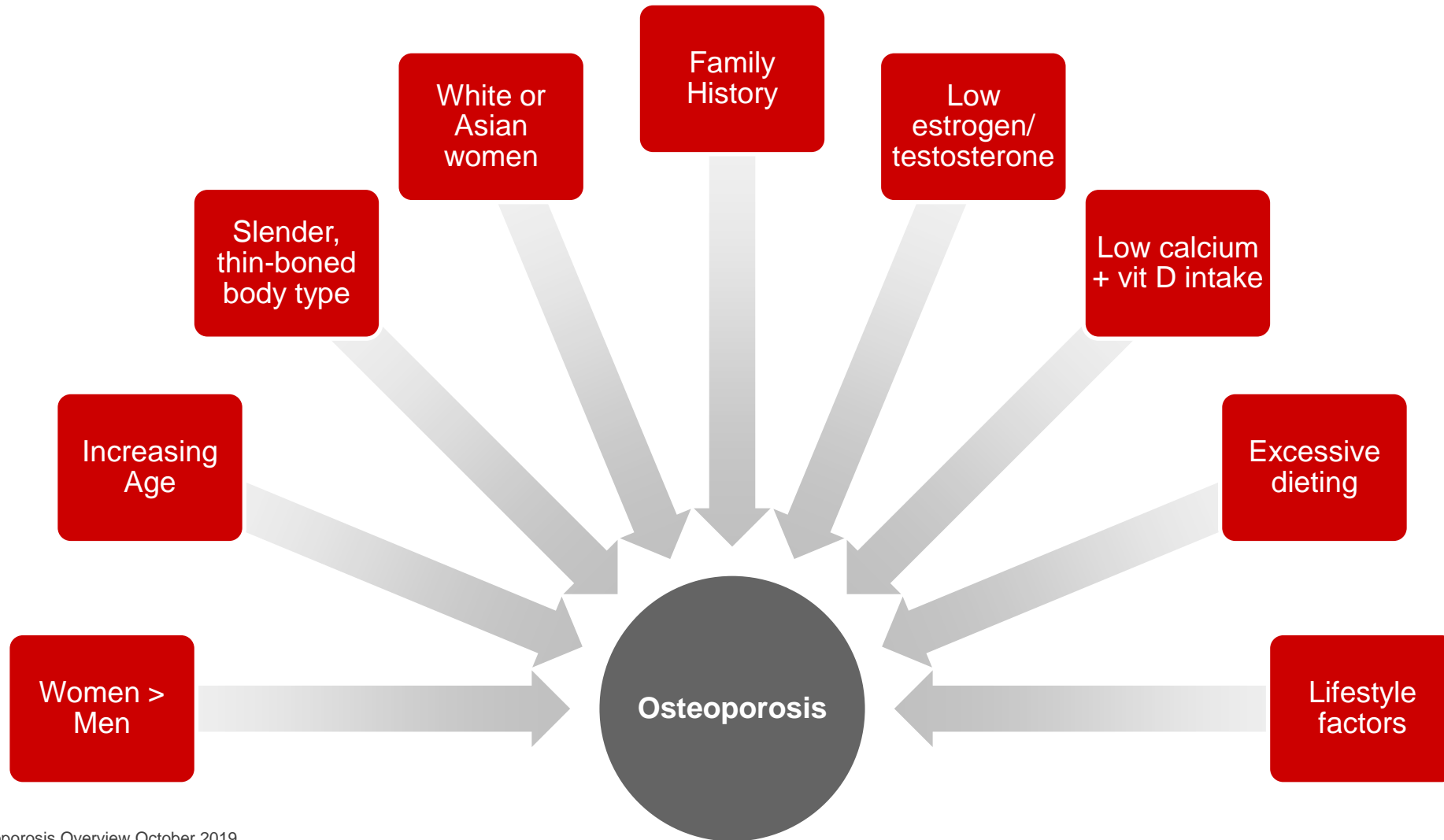
**1 in 4
men**

aged 50 and older
will break a bone due
to osteoporosis

Bone Health and Osteoporosis Foundation. What is osteoporosis and what causes it. 2023

Risk Factors of Osteoporosis

Risk Factors*



*Not all-inclusive
NIH ORBD NRC Osteoporosis Overview October 2019

Risk Factors*

Medical Conditions

- Diabetes
- Hyperthyroidism
- Calcium deficiency
- Chronic liver disease
- COPD
- Kidney disease
- Immobilization
- Major depression

Medications

- Anticonvulsants (e.g., phenytoin, valproate)
- Glucocorticoids (e.g., prednisone)
- Heparin
- Lithium
- PPI (e.g., omeprazole, pantoprazole)
- SSRI (e.g., escitalopram, sertraline)
- Thiazolidinediones (e.g., pioglitazone)

*Not all-inclusive

Camacho PM et al. American Association of Clinical Endocrinologists/American College of Endocrinology clinical practice guidelines for the diagnosis and treatment of postmenopausal osteoporosis- 2020 update executive summary. Endocr Pract. 2020; 26(5):564-570.

Medications to Prevent or Treat Osteoporosis

Role of Calcium + Vitamin D

To keep your bones strong, eat foods rich in calcium. Vitamin D helps your body absorb calcium.

Adults need 1,000 to 1,200 mg of calcium every day



Milk, nonfat
1 cup, 302 mg



OJ fortified with calcium
6 oz, 200 to 260 mg



Cheddar cheese shredded
1 ½ oz, 306 mg



Yogurt, plain low-fat
1 cup, 300 mg



Cereal fortified with calcium
1 cup, 100 to 1,000 mg



Broccoli, raw
1 cup, 90 mg



Cottage cheese, 1% milk fat
1 cup, 138 mg

HHS Surgeon General's Report on Bone Health and Osteoporosis December 2019.
Bone Health and Osteoporosis Foundation. Calcium and Vitamin D. 2023.

Medication Overview

Bisphosphonates

- Alendronate (Binosto, Fosamax, Fosamax/D)
- Risedronate (Actonel, Atelvia)
- Ibandronate (Boniva)
- Zoledronate (Reclast)

RANK Ligand Inhibitor

- Denosumab (Prolia)

Parathyroid Hormone Analogs

- Abaloparatide (Tymlos)
- Teriparatide (Forteo)

Sclerostin Inhibitor

- Romosozumab (Evenity)

Other Agents

- Calcitonin (Fortical, Miacalcin)
- Conjugated estrogens/bazedoxifene (Duavee)
- Raloxifene (Evista)

Eastell R. et al. Pharmacological Management of Osteoporosis in Postmenopausal Women: An Endocrine Society Clinical Practice Guideline. JCEM. 2019; 5(104):1595-1622.

LeBoff MS et al. The clinician's guide to prevention and treatment of osteoporosis. Osteoporos Int. 2022.

Shoback D. et al. Pharmacologic Management of Osteoporosis in Postmenopausal Women: An Endocrine Society Guideline Update. JCEM. 2020; 3(105):587-594.

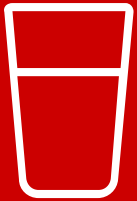
Bisphosphonates

	Route of Administration				Labeled Dosing Intervals				
	Tablet	Solution	Effervescent	Parenteral	Daily	Weekly	Monthly	Every 3 months	Every 1 to 2 years
Alendronate	✓	✓	✓		✓	✓			
Ibandronate	✓			✓			✓	✓	
Risedronate	✓				✓	✓	✓		
Zoledronic Acid				✓					✓

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Oral Bisphosphonates

Administration considerations



Administer 30 minutes*
before first food, beverage
or medication of the day with
6 to 8 oz of plain water



Resident should not lie down
for at least 30 minutes* and until after
first food of the day



Oral tablets should
NOT be crushed

* 60 minutes for ibandronate

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Bisphosphonates

Side Effects

- Upper GI complications
- Musculoskeletal pain
- Atypical femur fracture
- Jaw osteonecrosis

Monitoring parameters

- Basic metabolic panel (BMP)
- Serum calcium
- Serum phosphate
- Serum magnesium

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Denosumab (Prolia)

Administration Considerations



Subcutaneous injection given
in upper arm, upper thigh or
abdomen once every 6 months



Prefilled syringe
includes safety guard

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Denosumab (Prolia)

Side Effects

- Musculoskeletal pain
- Atypical femur fracture
- Jaw osteonecrosis
- Orthostatic hypotension possible following injection

Contraindications

- Hypocalcemia

Monitoring parameters

- Kidney function
- Serum calcium
- Serum phosphorus
- Serum magnesium

Individual prescribing information from
<https://dailymed.nlm.nih.gov/>

Teriparatide (Forteo) and Abaloparatide (Tymlos)

Administration considerations and side effects



Daily, subcutaneous injection

Sites of injection

Teriparatide: thigh or abdomen

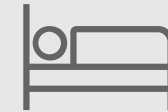
Abaloparatide: lower abdomen
(avoid the 2-inch area around
the navel)



Storage

Teriparatide: Store in the refrigerator
except when administering; discard 28
days after opening

Abaloparatide: Before use, store in
refrigerator, then can keep at room
temperature for 30 days



Side Effects

- Joint pain
- Dizziness
- Orthostatic hypotension possible
following injection
- Osteosarcoma
- Hypercalcemia

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Romosozumab (Evenity)

Administration considerations



Dose: 210 mg subcutaneously once monthly into abdomen, thigh or upper arm

Two separate syringes are needed to administer the total dose



Storage: In refrigerator; may be stored at room temperature for 30 days

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Romosozumab (Evenity)

Boxed Warning

Increases risk of myocardial infarction, stroke and cardiovascular death

Side Effects

- Jaw osteonecrosis
- Joint pain
- Muscle spasms
- Headache

Contraindication

- Hypocalcemia

Monitoring parameters

- Kidney function
- Serum calcium

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Drug Holidays and Duration of Treatment

Drug	General Considerations
Bisphosphonates	<ul style="list-style-type: none">• Consider a holiday after 5 years of oral or 3 years of IV bisphosphonate therapy
Denosumab (Prolia)	<ul style="list-style-type: none">• If therapy is stopped, individuals are advised to transition to an oral bisphosphonate to avoid bone loss after stopping denosumab
Teriparatide (Forteo) and Abaloparatide (Tymlos)	<ul style="list-style-type: none">• Generally, limit treatment to 2 years and transition to either a bisphosphonate or denosumab
Romosozumab (Evenity)	<ul style="list-style-type: none">• Limit treatment to 1 year and follow with a drug intended for long-term use, such as a bisphosphonate or denosumab

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Other Agents

Administration Considerations

Calcitonin (Fortical, Miacalcin)

- **Dosing:** 1 spray per day administered to one nostril, alternating nostrils daily
- Prime the pump before its first use – hold the bottle upright and depress pump until a full spray is released
- When administering, place the pump into the nostril with patient's head in upright position and depress the pump
- **Storage:** Unopened bottle in refrigerator; while in use can be kept at room temperature in an upright position

Raloxifene (Evista) and Conjugated estrogens/bazedoxifene (Duavee)

- Once daily dosing without regard to meals
- Should NOT be crushed

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

Other Agents

Side Effects

Calcitonin

- Nose bleeds
- Back pain
- Joint pain
- Headache

Raloxifene

- Stroke
- Leg cramps
- Hot flashes
- Arthralgia

Boxed Warning

- Increased risk of VTE and death from stroke

Contraindication

- History of VTE

Conjugated estrogens/ bazedoxifene

- Nausea
- Diarrhea
- Muscle spasms

Boxed Warning

- Increased risk of endometrial cancer, cardiovascular disorders, and dementia

Contraindications

- History of VTE
- Known or suspected breast cancer or estrogen-dependent neoplasia
- Undiagnosed abnormal uterine bleeding
- Known hepatic or thrombophilic disorders

VTE = venous thromboembolism

Individual prescribing information from <https://dailymed.nlm.nih.gov/>

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Take Aways

Osteoporosis is a “silent” disease; many more can be affected than what is known.

Achieve good bone health through adequate Calcium+ Vitamin D intake and appropriate use of medication

Vigilant monitoring and management of osteoporosis can improve quality of life

Thank you