

# **D-fying the Laws of Gravity**

## **Strategies for Preventing Falls for People with Diabetes**

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# Incidence rates of Falls (U.S.)

## Per person annually

- Community 0.2 - 0.8
- Hospital 0.6 - 2.9
- Long-term care 0.2 - 3.6  
(per bed)
- One of every three adults over 65 years fall in every year.
- One of every two adults over 80 years fall in every year

# People with Diabetes are at Risk for Falls

- **A1C below 7%** (indicating “tight” blood glucose control) are four times more likely to fall as those with an A1C above 7%
- **Metformin** can cause vitamin B12 deficiency, which can lead to postural instability (balance problems)
- **Peripheral neuropathy** can cause loss of sensation, numbness, and pain in feet and legs, resulting in slower gait & poor balance

# People with Diabetes are at Risk for Falls

- **Visual impairment** resulting from diabetic retinopathy, cataracts, glaucoma, or macular degeneration increase the risk of falling
- **Impaired kidney function** from diabetic nephropathy can lead to inadequate levels of vitamin D, which can reduce bone density and muscle strength
- **Wounds, skin breakdown, joint inflammation, or joint deformity** can lead to instability when walking

# Normal Changes of Gait

- Slower gait
- Decreased stride length & arm swing
- Forward flexion at head & torso
- Increased flexion at shoulders & knees
- Increased lateral sway



# Falls are multifactorial

## Intrinsic Factors

Medical  
conditions

Impaired  
vision and  
hearing

Age related  
changes

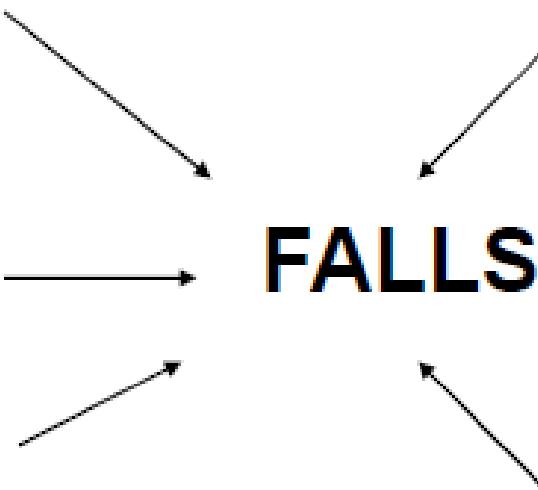
## Extrinsic Factors

Medications

Improper use  
of assistive  
devices

Environment

**FALLS**



# Common Pathologies Associated With Falls

- Hypoglycemia
- Dizziness and disequilibrium
- Ophthalmologic diseases
- Foot problems
- Neurologic illness
  - Parkinson's & related disorders
  - Strokes
  - Peripheral neuropathy

# Medications and Falls

- Hypoglycemia from mismatched diabetes medicines with blood glucose excursions
- Sedative-hypnotics, especially long acting benzodiazepines
- SSRIs and TCAs both increase falls

# Evaluation of Falls: *History*

- Location & circumstances of Fall
- Associated symptoms
- Other falls or near falls
- Medications (including nonprescription) and alcohol
- Injury & ability to get up

# Evaluation of Falls: *Risk Factors for Injury*

- Medication review
- Osteoporosis risk assessment
- Anticoagulation: Usual benefits outweigh risks unless repeat or high risk faller

# Evaluation of Falls: *Physical Examination*

- Routine physical examination
  - Focus on cardiovascular, MS, neuro, feet
  - Supine and standing BP
- Vision and hearing evaluation
- Formal gait and balance assessment
  - Get up and Go Test
  - Functional Reach Test
  - Tinetti Gait & Balance Evaluation [Performance oriented mobility assessment]

# Evaluation of Falls: *Home Evaluation*

- Can be performed by nurse, OT, PT, others
- Stairs
- Lighting
- Clutter
- Bathroom
- Specific hazards: cords, throw rugs



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# Avoiding Polypharmacy

## **Simple**

- Use least frequent dosing needed
- Tie to scheduled daily activities, meals, sleep/wake

## **Support**

- Educate
- Medication Flow sheet
- Use of one pharmacist
- Enlist family, friends as needed
- Medication organization equipment

## **Survey**

- Periodic review

# Exercise And Falls

- The Frailty and Injuries: Cooperative Studies of Intervention Techniques (FICSIT) meta-analysis
- Incorporated exercises study – seven studies
- Intensive strength, endurance training, or balance training
- Overall significant reduction of fall
- “Tai Chi” reduced the rate of falls during 4 months follow up in women at moderate risk of falls

# Prevention & Treatment

- Optimize blood glucose control
- Perform regular foot checks
- Schedule annual dilated eye exam
- Correct sensory impairments
- Treat injury, anxiety, depression, medical conditions
- Remove unnecessary medications
- Rehab, exercises, assistive devices
- Modify environment
- Limit alcohol use
- Evaluate for osteoporosis treatment
- Screen for falls: gait, balance, and ankle muscle strength assessment

