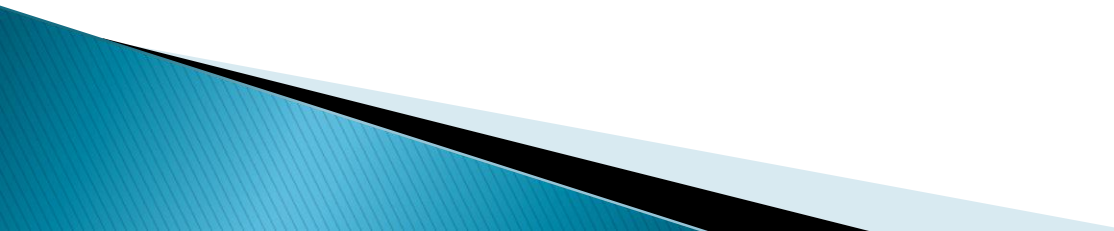


How to Fall Safely

Texas Woman's University
DPT Class of 2011

Objectives

- ▶ Understand the significance of falls
 - ▶ List outcomes from falling
 - ▶ Recognize role fear plays in falling
 - ▶ Identify risks for falling
 - ▶ Describe the anatomy of balance systems
 - ▶ Safe Falling Techniques
 - ▶ Summarize evidence
- 

Falls in Elderly Population

- ▶ Leading cause of mortality & morbidity in elderly¹
- ▶ > 1 / 3 of adults 65+ fall each year in the U.S.²
- ▶ Most common cause of nonfatal injuries & hospital admissions for trauma²
- ▶ In 2005:
 - 15,800 people 65+ died from injuries related to falls
 - ~1.8 million people 65+ were treated in EDs for nonfatal injuries from falls²
- ▶ Rates of fall-related deaths have risen significantly over past decade²

Risk For Falls in Older Adults

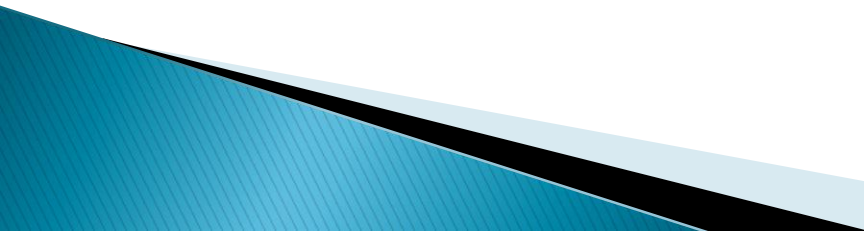
Women

- ▶ 67% more likely to have a non-fatal fall
- ▶ 2x more likely to have a fracture with a fall
- ▶ 72% of persons admitted for hip fractures in 2003
- ▶ White > AA

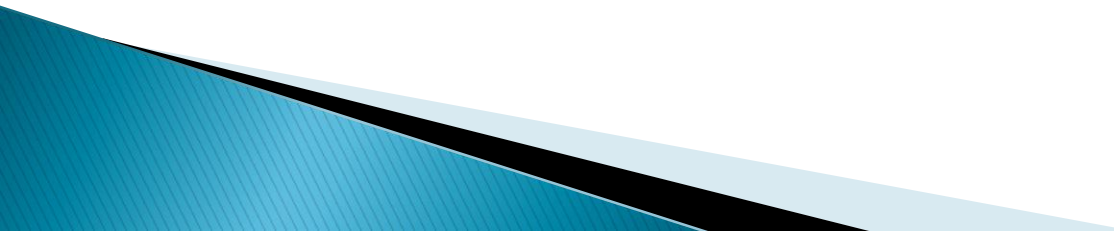
Men

- ▶ 49% more likely to have a fatal fall
- ▶ 75+ years:
 - white men > white women > AA men > AA women > Hispanics¹

Outcomes of Falls

- ▶ Most common cause of TBIs
 - ▶ In 2000, TBI accounted for 46% of fatal falls among older adults
 - ▶ Cause of most fractures among older adults
 - Spine, hip, forearm, leg, ankle, pelvis, arm, & hand
 - ▶ In 2000, direct medical cost:
 - \$179 million for fatal falls
 - \$19 billion for nonfatal fall injuries
 - ▶ Many develop a fear of falling
- 

Fear of Falling

- ▶ A pervasive & debilitating condition
 - ▶ Can lead to self-imposed activity restriction & physical deterioration
 - ▶ Results in a loss of independence
 - ▶ Prevalence of fear of falling among the elderly
 - ▶ Higher fall rates among those who fear falling...²
- 

Anatomy of Balance Systems



- Visual System
- Somatosensory System
- Vestibular System

Sensory Influences on Balance

▶ Visual System

- Orientation to horizontal & vertical
 - Walls
 - Floors
 - Ceilings
- Convergence & Divergence
 - Ability of eyes to work together
 - Test: move thumb toward & away from face
- Does not distinguish between self movement and external movement³

Sensory Influences on Balance

▶ Somatosensory System

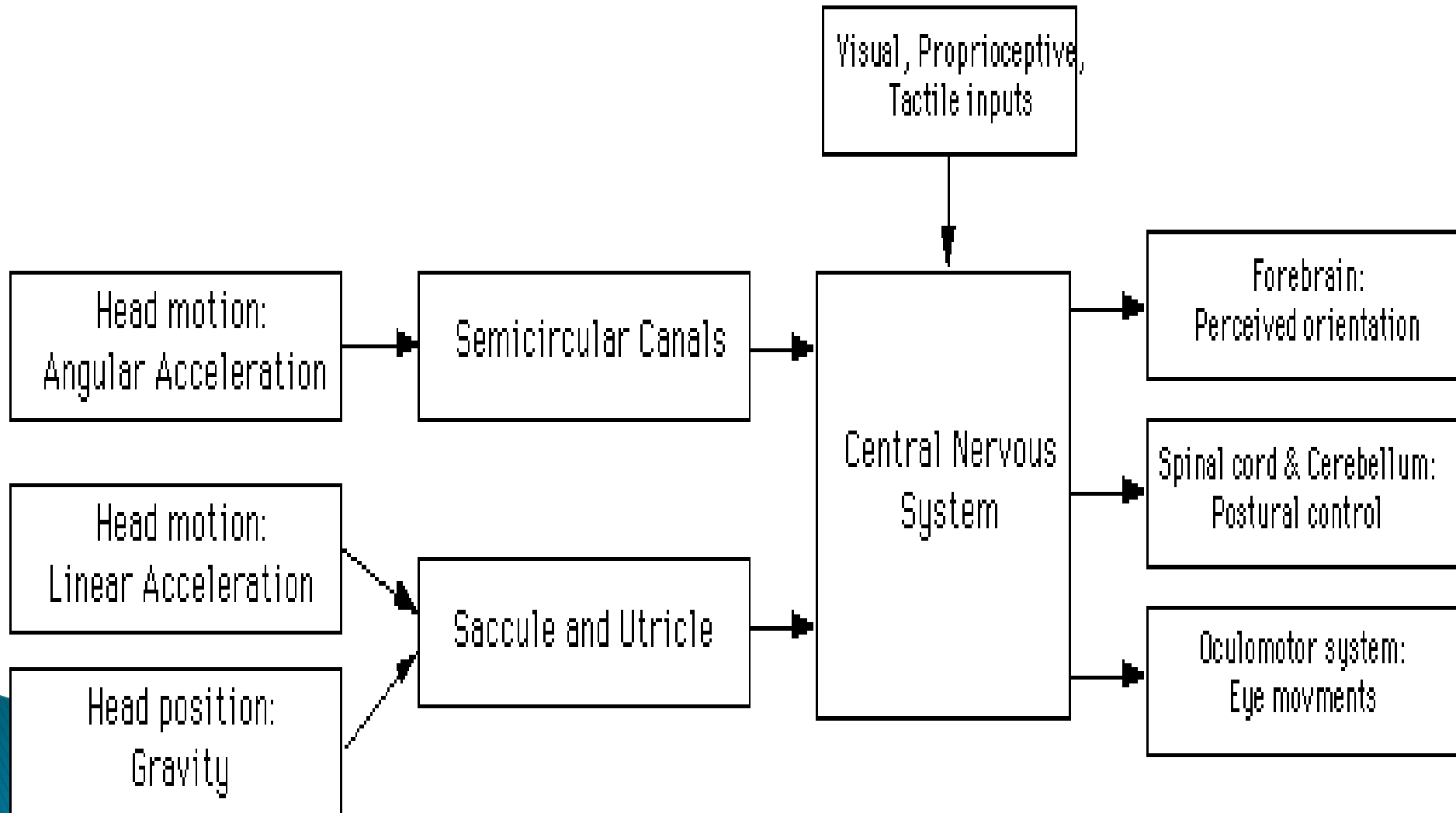
- Proprioception
 - Relationship of body segments & support surface
- Slow perturbations of balance
- Tests
 - Joint position sense
 - Inaccurate information provided when standing on compliant or uneven surface³

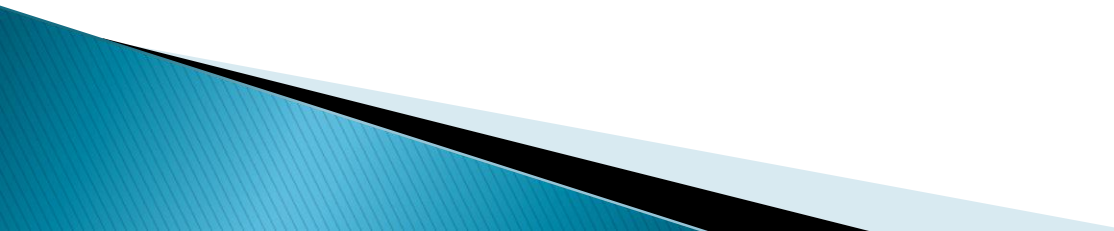
Sensory Influences on Balance

▶ Vestibular System

- Position of head relative to gravity
- Direction and speed of head movement
 - Semicircular Canals
 - Perpendicular relationships
 - Coplanar
 - Push-pull relationship system
 - “Yes” & “No”
 - Otoliths
 - Linear Motion: acceleration & deceleration
 - Antigravity System: tilt, side-bend
 - Utricle: horizontal plane
 - Sacculle: vertical plane³

VESTIBULAR SYSTEM



- ▶ Higher fall rates among those who fear falling.²
 - ▶ Not all falls can be prevented.
 - ▶ So... Let's learn how to fall safely and eliminate those fears!
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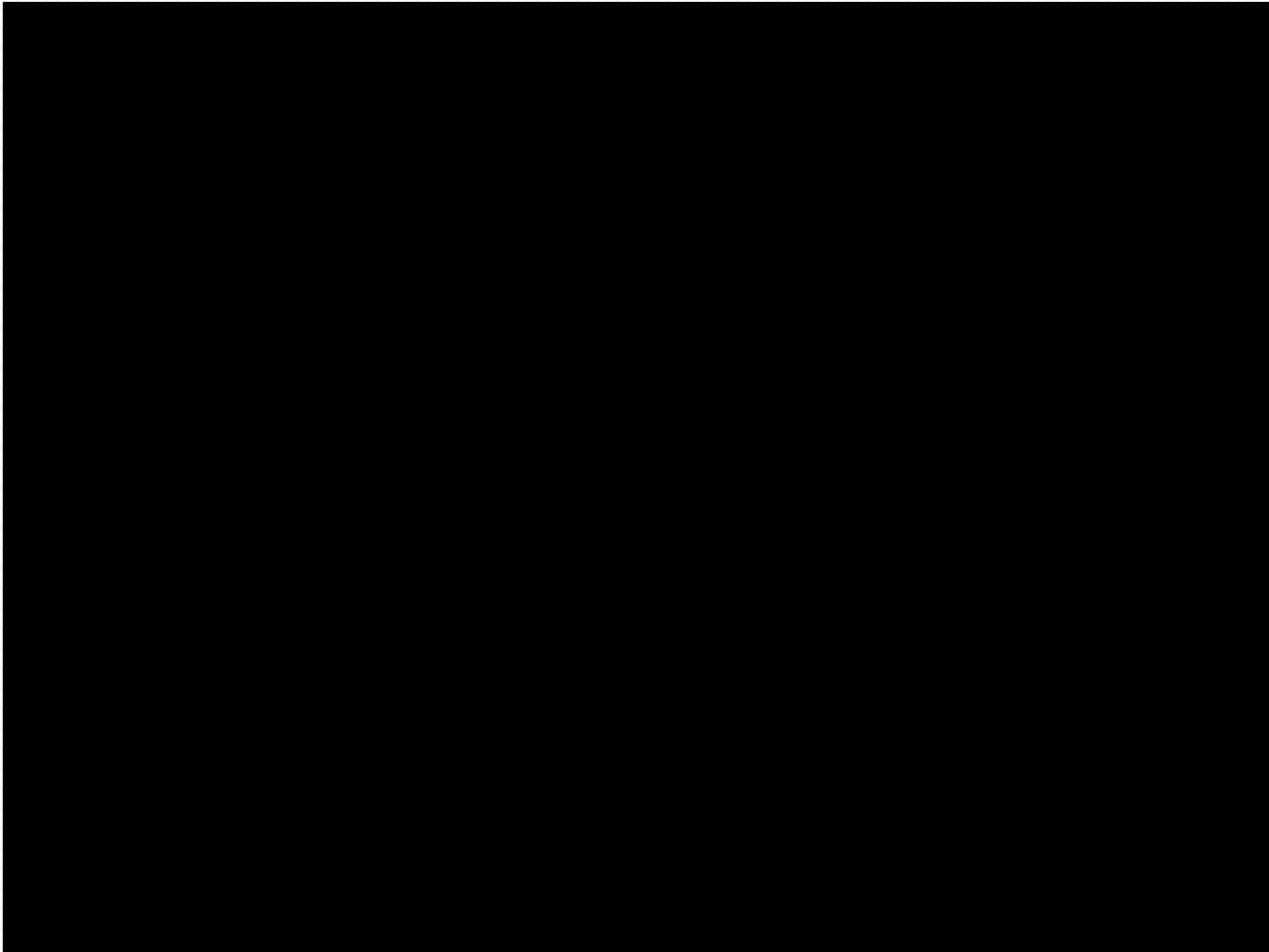
Falling Forward⁴

Do:

- ▶ Keep your head up.
- ▶ Quickly slap ground with palms.
- ▶ Breathe out.
- ▶ Fold your body
 - Like an accordion!

Do Not:

- ▶ Lock joints
 - Elbows
 - Wrists
 - Shoulders



Falling Forward Safely

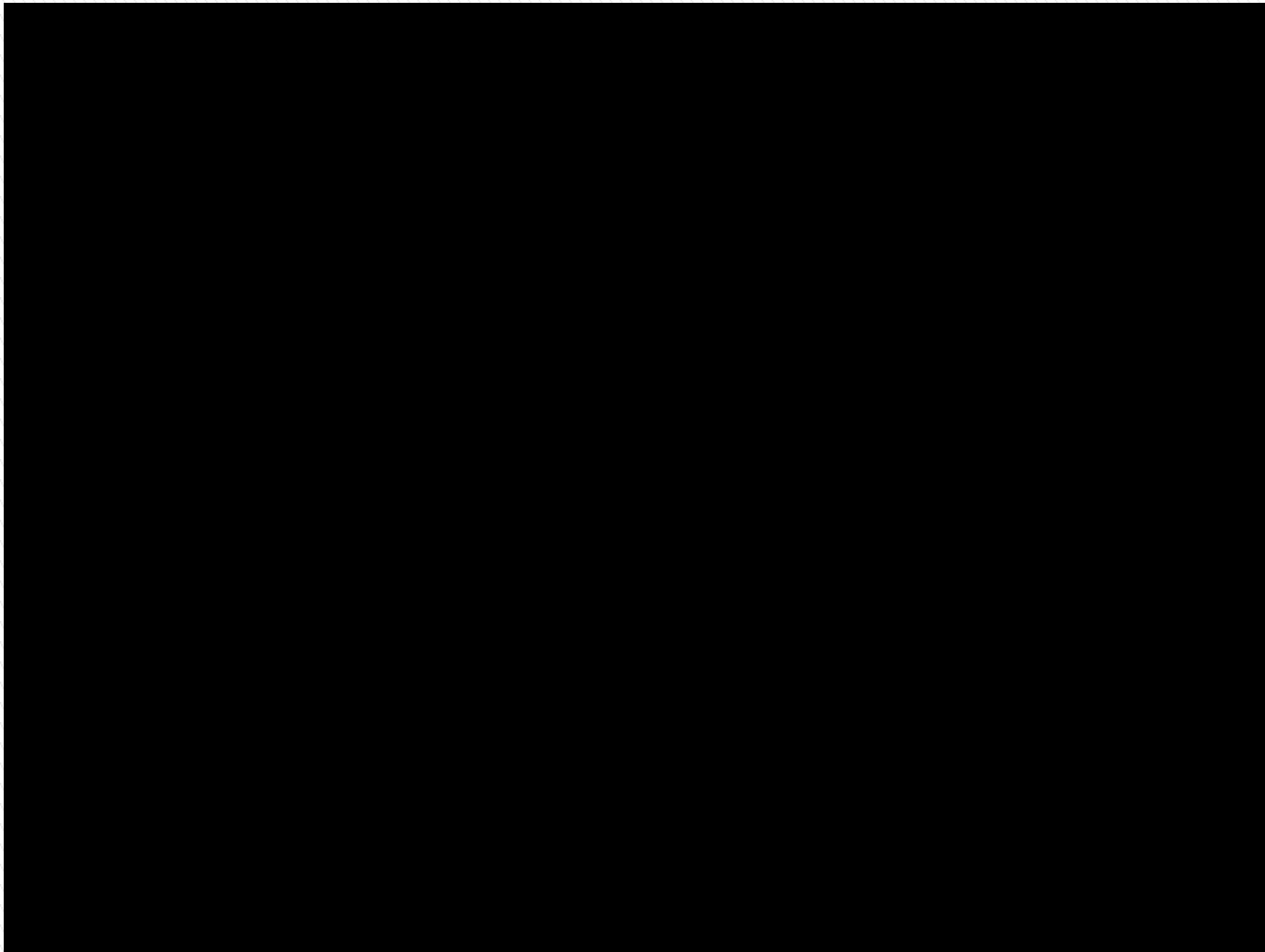
Falling Backward⁴

Do:

- ▶ Tuck chin
- ▶ Round back
- ▶ Squat
 - Bend hips
 - Bend knees
- ▶ Keep arms out to side
- ▶ Slap palms on ground

Do Not:

- ▶ Use extend your arms to break the fall



Falling Backward Safely

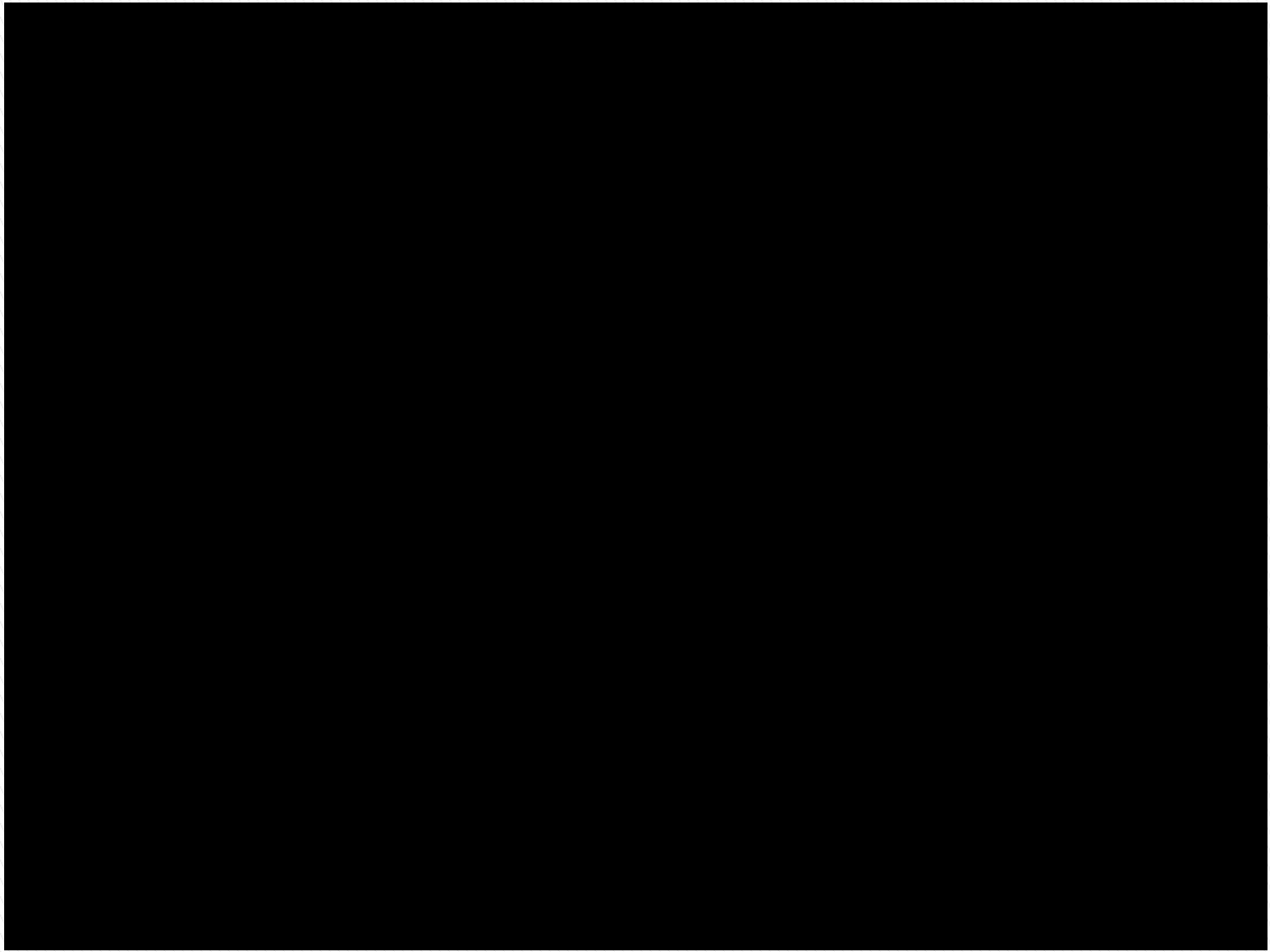
Falling Sideways⁴

Do:

- ▶ Tuck chin
- ▶ Grab opposite hip
- ▶ Squat
- ▶ Roll onto back
- ▶ Slap ground with free hand

Do Not:

- ▶ Extend your arm to break the fall
- ▶ Fall directly onto hip

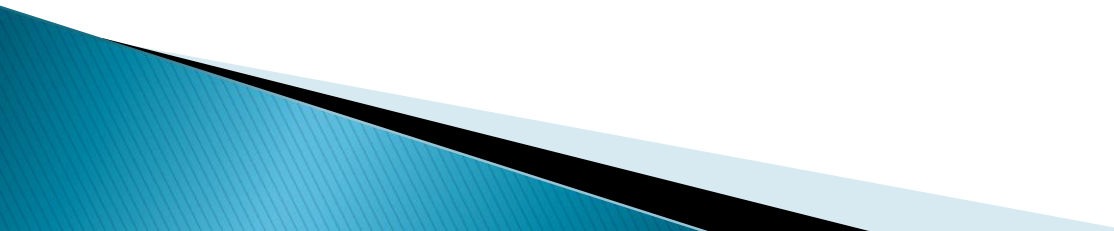


Falling Sideways Safely

Important Message

- ▶ Knowing how to fall is only the first step.
- ▶ You must PRACTICE these techniques to make them natural tendencies.

Quick Summary

- ▶ # of falls has increased significantly over past decade in U.S.
 - ▶ Falls are leading cause of mortality & morbidity in elderly
 - ▶ Fear of falling = higher risk for falls
 - ▶ Vestibular, somatosensory, & visual systems play important role in balance
 - ▶ Environmental factors play role in falls
 - ▶ Safe falling techniques
- 

References

1. Brown LA, Polych MA, Doan JB. The effect of anxiety on the regulation of upright standing among younger and older adults. *Gait Posture*. 2006;24(4):397–405. DOI: 10.1016/j.gaitpost.2005.04.013.
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4. How to Fall Safely. WikiHow.com. Accessed September 21, 2010. <http://www.wikihow.com/Fall-Safely>.