

# Falls and Fall Risk



# Attributing Responsibility

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- Falls are an issue where there are many attempts to attribute responsibility and/or place blame
  - Sometimes valid, sometimes not
  - Often simplistic explanations
  - May not recognize full range and complexity of related factors
  - Many iatrogenic causes
  - Risk often originates in treatment implemented elsewhere



# Fall: Definition

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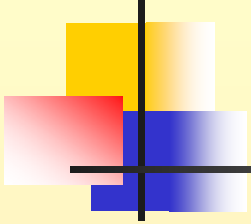
- MDS 3.0
  - “Unintentional change in position coming to rest on the ground or onto the next lower surface (e.g., onto a bed, chair or bedside mat)”
- In common everyday use
  - Uncontrolled, abrupt movement to the ground from a higher elevation
- In everyday use, a fall is not
  - Purposely sitting on, or lowering self to, the ground
  - Going to the ground in a controlled manner
  - Losing balance without winding up on the ground
  - Being assisted in controlled fashion to the ground



# Maintaining Upright Posture

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- Nervous system
  - Motor pathways
  - Cerebellum
  - Brainstem
  - Connecting pathways
  - Vestibular system, including middle and inner ear
  - Spinal cord and peripheral nervous system
  - Sensory organs (eyes, ears)
- Musculoskeletal system
- Cardiovascular system





# Maintaining Upright Posture

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- Kidneys and fluid regulatory system
- Pulmonary / lungs
- Gastrointestinal system
- Other systems affecting alertness, balance
  - Endocrine system
  - General metabolic status



# Categories of Causes

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- Direct: affect organ function needed to maintain balance and upright posture
  - Stroke, Parkinsons, delirium
  - Position sense: 1/3 elderly have impairment
  - Inner or middle ear infection
  - Visual disturbance: cataracts, glare, loss of visual acuity
  - Vitamin B12 deficiency causing spinal cord degeneration
  - Acoustic nerve damage from antibiotics and certain diuretics, especially with renal failure



# Categories of Causes

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- Indirect: indirectly affect something involved in maintaining posture or contribute to need to be upright
  - Medications affect alertness
  - Diuretics reduce fluid volume or stimulate frequent need to get up and urinate
  - “Noncompliance” alone is not a direct cause, because noncompliant people do not necessarily fall



# Categories of Causes

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- Internal and external
  - Those that occur within the person
    - Illnesses, imbalances, abnormalities
  - Those that exist outside the person
    - Environmental factors
      - Lighting
      - Furniture, rugs, etc.
- Frequently, combination of factors
  - For example, iatrogenic illness and total management of person with acute illness

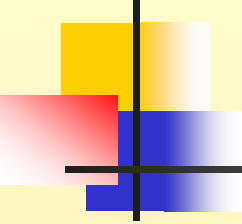


# Nursing Home Falls

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- Significant portion are cardiovascular-related
  - Drug-induced, postprandial, or postural hypotension, etc.
  - Bradycardia
- Relatively few due to acute illness
  - Pneumonia, febrile illness, CHF, urosepsis, etc.
    - Am J Med 1986;80:429
- Significant number due to environmental hazards

# Potential Consequences of Falls



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- Abrasions, contusions, lacerations
- Hemorrhage (internal and external bleeding)
  - For example, subdural hematoma, bruising
- Fracture, sprain, or dislocation
- Fear of subsequent falling



# Fall Assessment: Desirable Approaches

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- Same approach as for any condition, risk, or problem
  - Logical, systematic, consistent
- Recognition Assessment
- Diagnosis / cause identification
- Management
- Monitoring



# Recognition

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- Identify fall risk
- Identify circumstances and consequences of actual falls



# Significant Risk Factors for Falling

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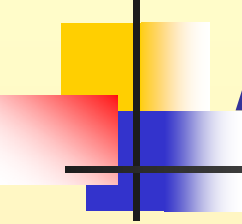
- Ask about dizziness (lightheaded, vertigo)
- Check BP in multiple positions
- Identify significant sensory, motor deficits
- Review all medications
- Review prolonged immobility, horizontal position
- Assess balance, gait



# Key Starting Point: Actual Fall

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- Did individual fall while
  - Already upright and/or ambulating
    - Suggesting hypotension, balance or gait disorder, medication adverse consequences, environmental
  - Trying to get to an upright position
    - Suggesting weakness due to musculoskeletal or neurological disorder, medication adverse consequences
  - In a lying or sitting position
    - Suggesting something other than environmental or medically related cause



# Actual or Suspected Fall

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- Assess for possible injury
- Based on prominence of symptoms
  - Specific: severe pain, swelling, bruising, deformity
- Indicate what was checked
- Recognize delayed reactions



# Management

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- Fall prevention
  - Generic measures
  - Target risk factors
- Actual falls
  - Address causes
  - Address consequences
- Manage sequentially, systematically
  - Not just randomly



# Fall Prevention

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- Assess likelihood of falling, based on identified risks
- Identify and address underlying medical conditions and illnesses, to the extent possible
- Review medications (including combinations)
  - Try to reduce number and doses of medications that increase fall risk, directly or indirectly

# Medications and Falls: Bottom Line



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- For someone on one or several categories of medications associated with falling risk and who has fallen more than once or without another identifiable cause
  - Consider medications a major suspect until proven otherwise
  - Often even if another cause seems apparent



# Medications

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- For someone who falls repeatedly
  - Identify dizziness, lightheadedness, gait disturbance
  - Identify medications or medication combinations commonly associated with falling or high fall risk
  - Adjust or stop (at least one at a time) to see possible effect on falling OR
  - Alternatively: explain why they cannot be tapered or stopped, even for a short time
    - Serious cardiomyopathy, major depression, severe hypertension



# Medication Categories Associated With Falling

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- Antidepressants
- Antiepileptics
- Antihypertensives
- Anti-Parkinsonian agents
- Benzodiazepines
- Cardiovascular medications



# Medication Categories Associated With Falling

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- Diuretics
- Gastrointestinal medications
  - PPIs: osteoporosis, Vitamin B12 deficiency
  - Metoclopramide (Reglan): dyskinesia
- Narcotic analgesics
- Psychopharmacological medications
  - All categories
- Urinary incontinence medications
  - Including medications to treat BPH
- Vasodilators



# Vitamin D

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- May reduce fall risk and help prevent fall-related complications
- Recognize risk of Vitamin D toxicity
- May be worth checking serum 1,25-dihydroxy vitamin D levels
- Don't overdo a good thing
  - Vitamin D can accumulate and cause toxicity



# Exercise Programs

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- To the extent possible, given underlying impairments and limitations
  - Including resistance training, balance and gait training, endurance training, flexibility programs
  - Both
    - Generic, to try to strengthen and improve flexibility, balance, and gait
    - To address specific impairments



# Devices

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- Devices
  - Those used to try to limit opportunities for falling
    - Canes, walkers, wheelchairs, etc
    - Shoes
  - Those used to try to limit consequences of falling
    - Low beds, fall mats
  - Target device use
    - Rote approaches, such as low beds, can be problematic in individual cases
- Bed and chair alarms of questionable value
- Restraints / assistive devices
  - Some absolutes, some relative



# Environment

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- Arm rests for chairs and toilet seats
- Reduce obstacles
- Adequate lighting including glare reduction



# Managing Risks

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- Specific devices may be OK if reasons for selecting specific devices are identified and related to recognized or likely causes, risks, or consequences
- Manage actual or probable causes OR
  - Explain why they cannot or should not be managed



# General Systemic Causes

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- Delirium
- Pain
- Volume depletion
- Anemia
- Causes of syncope and transient ischemic attacks
- Occasionally, infections
  - Not to be confused with colonization



# Neurological Causes

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- Identify possibly correctable and noncorrectable cause(s)
  - Peripheral neuropathy, severe stroke, visual disturbances
  - Parkinsonism: motor imbalance
- Decide if cause-specific interventions indicated
- Document irreversible factors
  - Identify possible compensatory approaches



# Cardiovascular Causes

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- Check rate and rhythm
- Review medications
- Evaluate for cardiac related symptoms
- Based on preliminary findings
  - Evaluate for possible TIA
  - Consider Holter or similar monitoring if indicated



# Musculoskeletal Causes

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- Deformities, myopathies, osteoporosis
- Consider whether any corrective interventions possible



# Balance Disturbance

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- Seek specific cause(s)
- Identify possibly correctable and non-correctable cause(s)
  - Cerebellar infarction, severe stroke, etc.
- Decide if cause-specific interventions indicated
  - Musculoskeletal weakness
- Decide whether symptomatic (non-specific) interventions indicated
  - Physical therapy



# Behavioral Causes

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- Cognitive impairment
- Delirium
- Personality dysfunction
- Personal preference



# Interventions to Try to Minimize Consequences

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- Low beds
- Mats on the floor
- Padding for hips
- Footwear
- Osteoporosis treatment



# Monitoring After Falls

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- Monitor for delayed consequences
  - Observe for consequences (late evidence of fracture, altered mental status, etc.) for at least 48 hours after a probable or witnessed fall
- Monitor for response to attempted prevention
  - Monitor individual's response to interventions intended to reduce causes, risk, and consequences of falling
- Periodically, review whether current approaches
  - Are working
  - Should be continued, adjusted, or discontinued



# Fractures: Not All They Are Cracked up to Be

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- X-Rays can miss many fractures
- X-Rays can give false positives
  - <http://news.bbc.co.uk/2/hi/health/8579846.stm>
  - MRIs are not a practical solution



# Fractures: Not All They Are Cracked up to Be

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- Delayed evidence of fracture not uncommon
- Spontaneous fracture not uncommon
- Follow up clinically those who decline or have residual symptoms after trauma with no apparent injury or negative X-Ray
  - Delayed diagnosis may be no one's fault if prudent process has been followed



# Facility Systematic Approach

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- We recognize that falling is a common occurrence in our population and a risk for complications
- We acknowledge that while falling and serious complications of falling cannot always be prevented, it is often possible to address causes and try to minimize consequences
- We have a systematic plan to try to identify and address causes of falling and increased fall risk



# Systematic Approach

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- We follow specific steps in evaluating each individual
- We seek and identify a history of recent or current falls
  - We try to characterize the fall history (frequency, circumstances, etc.)
    - We try to get more information, as needed



# Systematic Approach

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- We seek and identify significant risk factors for falling
  - We ask each person (who can respond) if they have dizziness (lightheadedness, vertigo) in any position, especially standing
  - We review for medications or combinations associated with a significant risk of causing or increasing dizziness, lethargy, confusion, or balance problems
  - We evaluate for significant disturbances of balance and gait
  - We consider possible environmental hazards



# Cause Identification: Systematic Approach

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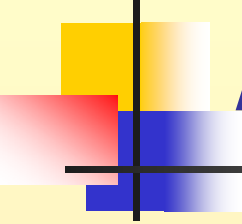
- We try to identify cause(s) of falling or fall risk
- If individual falls again despite efforts to address suspected cause, we consider other possible causes until a cause is identified, falling stops or declines markedly, or it is determined that none can be identified



# Cause Identification: Systematic Approach

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- Alternatively
  - If additional evaluation for causes of falling is not being pursued, we indicate why individual should not be tested or evaluated
    - For example, cause already identified, cause cannot be corrected, identifying causes would not change management
  - However, need some evidence, not just a way out of trying



# Management: Systematic Approach

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- We address potentially serious consequences OR indicate why they cannot or should not be addressed
- We address identified causes OR indicate why causes cannot or should not be managed
  - We address possible causes sequentially, systematically, not randomly



# Managing Consequences: Systematic Approach

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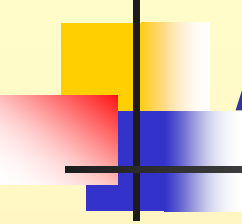
- We have a systematic evaluation for someone who has apparently fallen
- We assess for possible injury and document the results of that evaluation
- We take into account possible delayed complications for at least 48 hours after the event



# Managing Risks: Systematic Approach

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- We consider the risks and benefits of limiting and maximizing mobility
- We identify a basis for choosing to use devices to limit mobility and/or selecting specific devices, which is related to recognized or likely causes, risks, or consequences



# Monitoring: Systematic Approach

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- We evaluate responses to attempted interventions intended to reduce causes, risk, and consequences of falling
- Periodically, we review whether current approaches should be continued, adjusted, or discontinued



# Conclusions

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- Ultimately, nothing predicts or prevents all falls
  - Risk assessment is imperfect
  - Often don't know until we try
- Follow the basic care delivery process to demonstrate good faith compliance
- Explain basis for decisions to act / not act at certain steps



# Conclusions

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- Try to identify and address causes, where feasible
- Interventions can be individualized and cause-specific
  - Do not have to exhaust all possibilities
    - Example: no need to get special shoes for someone for whom footwear not identified as a risk or problem
  - Available tests cannot always detect complications



# Conclusions

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- If someone falls and/or is injured despite appropriate process
  - Evidence needed to show causation despite reasonable process
  - It may not be the facility's fault