Regional Geriatric Program of Eastern Ontario

INTRODUCING

Cheryl McShane

GERIATRIC ASSESSOR

QUEENSWAY CARLETON HOSPITAL

Cheryl is a Geriatric Assessor with the Geriatric Assessment Outreach Team of the Regional Geriatric Program of Eastern Ontario. She has been with the team for over 12 years, and, prior to this, she worked as a physiotherapist at the Queensway Carleton Hospital. Cheryl completed her Bachelor's of Science in Physiotherapy Degree at McGill University and has had experience working in a variety of clinical settings such as acute care hospitals, rehabilitation centers, retirement homes and long-term care facilities. In her current role, Cheryl enjoys helping community-dwelling seniors access health care and community services that will support them to remain as independent as possible. She is passionate about health promotion and tries to incorporate this as much as possible.

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www.rgpeo.com

FALLS

Assessment and Intervention

Cheryl McShane

Geriatric Assessor

Geriatric Assessment Outreach Team

Queensway Carleton Hospital

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ACKNOWLEDGEMENT

- Mary Haller, PT- TOH C-FAST Clinic (Retired)
- Dr. Shirley Huang, Geriatrician TOH
- Taryn McKenzie, APN- TOH C-FAST Clinic
- Dr. Frank Molnar, Geriatrician TOH
- Anna Banks, PT- West End Integrated Falls Prevention Program

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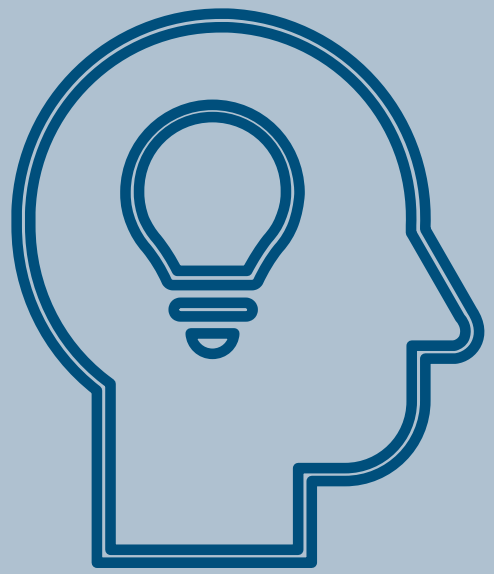
LEARNING OBJECTIVES



1. Highlight the importance of fall prevention in older adults
2. Review age-related changes
3. Discuss the components of a multifactorial fall risk assessment
4. Identify modifiable and non-modifiable risk factors for falls

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FALLS ARE COMMON

- It is estimated that 1 in 3 seniors is likely to fall at least once per year.
- For those over 80 years old, 50% typically fall each year, and half of those will fall 2 or more times.
- Falls cause 95% of all hip fractures.
- Falls are the leading cause of injury-related hospitalization and death among individuals aged 65 years and older.
- Falls cause 85% of seniors' injury-related hospitalizations.

(Public Health Agency of Canada, 2014)
(Inouye et al, 2009)

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WHY STOP FALLS?

- Falls are not part of normal aging
- Falls can lead to:
  - Chronic pain
  - Loss of confidence, reduced mobility and independence
  - Fear of falling, depression and anxiety
  - Activity restriction
  - Social isolation

(Public Health Agency of Canada, 2014)

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FALLS ARE COSTLY

In 2018, the direct cost of fall-related injuries in Canada for those aged 65 years and older was $5.6 billion.

(Parachute, 2018)

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"By reducing seniors' falls by 20 percent between 2010 and 2035, it is forecasted that we can save 4400 lives and save $10.8 billion in health-care costs."

(Parachute, 2015)

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THE GOOD NEWS

The literature suggests that as many as 1/3 of falls-related adverse outcomes are preventable.

(LHIN Collaborative, 2011)

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THE BAD NEWS

Falls are under-reported

- highly subjective definitions of what constitutes a fall
- often attributed to normal aging
- denial/embarrassment/fear of being labeled as a faller and losing independence
- inaccurate recall, particularly for non-injurious falls

WHY DO FALLS OCCUR?

Biological Factors

Behavioural Factors

Environmental Factors

Socio-economic Factors

"Most falls occur as a result of compounding factors that combine and overwhelm an older person's ability to maintain or regain his or her balance."

(Public Health Agency of Canada, 2014)

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CHAT

Can you name any **Biological Risk Factors**?

Write in the chat!

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BIOLOGICAL RISK FACTORS

- Age-related changes
- Medical conditions
- Acute or chronic illness
- Dizziness/postural hypotension
- Bowel and bladder problems
- Medications
- Visual deficits/glasses
- Hearing loss
- Decreased sensation

- Pain
- Balance or gait problems
- Foot problems (toe/nail deformities, ulcers, edema)
- Lower extremity weakness
- Depression
- Cognitive impairment
- Functional/ADL impairment
- History of falls

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RISK FACTORS RELATED TO NORMAL AGING

- Stiffening of connective tissue
- Loss of muscle mass
- Slowing of nerve conduction
- Decreased visual acuity
- Impaired depth perception
- Cardiovascular changes
- Decreased joint range of motion

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Physical inactivity, adiposity and sedentary behavior are ACCELERATORS of aging physiology.

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CHAT

Can you name any **Behavioural Risk Factors**?

Write in the chat!

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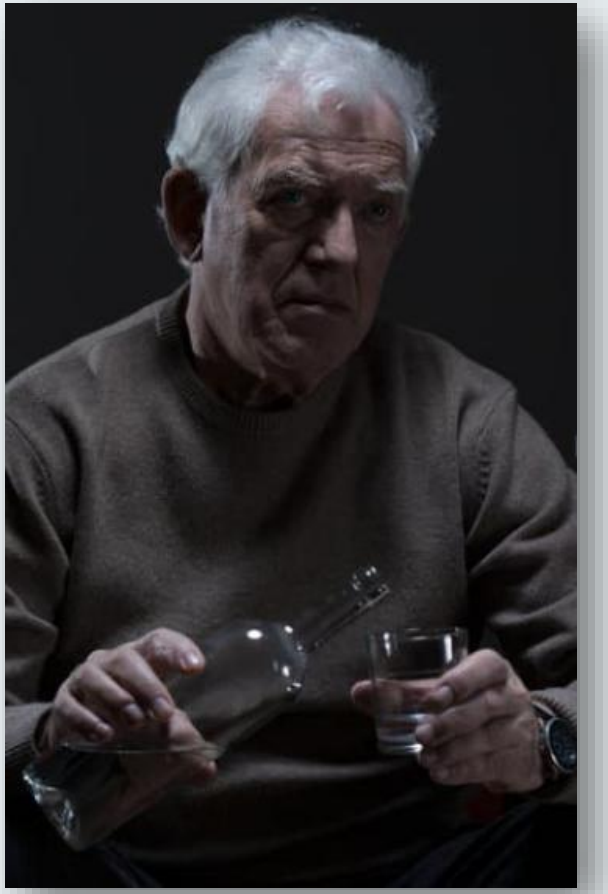
BEHAVIOURAL RISK FACTORS

- Risk-taking attitudes (action or inaction)
- Reduced physical activity
- Excessive alcohol use
- Fear of falling
- Improper footwear/clothing
- Use of assistive devices
- Poor nutrition/hydration
- Lack of sleep



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CHAT

Can you name any **Environmental Risk Factors**?

Write in the chat!

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ENVIRONMENTAL RISK FACTORS- INDOORS

- Poorly maintained home
- Stairs without handrails or marking on the edges
- Poorly lit stairs, ramps or doorways
- Pets
- Slippery floors, throw rugs, loose carpets

- Raised sills in door jams
- Clutter
- Low toilet seats
- Lack of grab bars in bathrooms
- Stairs with irregular step width or height

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ENVIRONMENTAL RISK FACTORS - OUTDOORS

- Use of assistive devices
- Public/community hazards
- Wintery conditions - snow or ice on stairs or walkway
- Uneven sidewalks or cracks in sidewalks
- Stairs without handrails or marking on the edges

- Poor lighting
- Objects on sidewalks or walkways such as garbage cans
- Unmarked curbs or corners without curb ramps
- Long crosswalks without pedestrian islands

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CHAT

Can you name any **Social and Economic Risk Factors**?

Write in the chat!

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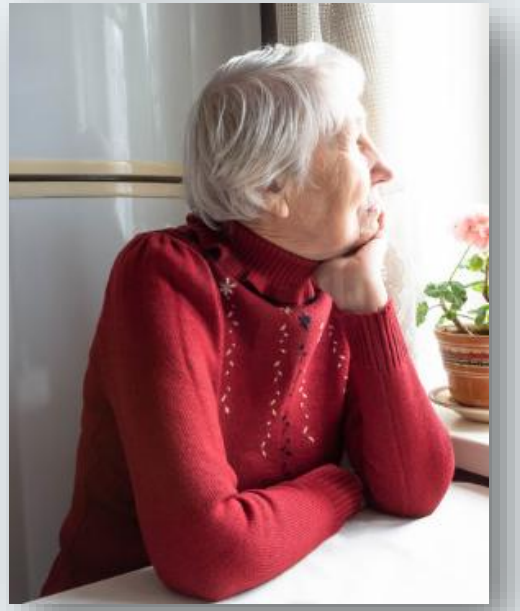
SOCIAL AND ECONOMIC RISK FACTORS

- Isolation
- Language barrier
- Poor living conditions
- Lack of transportation
- Low level of education



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☐ 1. **History of Falls or Near Falls** – complete History of Frequency and Circumstances of the Fall(s)

☐ 2. **Medical**

☐ **Acute or Fluctuating Medical Conditions/Symptoms** (syncope, seizures, hypo/hyperglycemia, arrhythmia, dizziness, light-headedness, etc.)

☐ **Chronic Medical Conditions** (diabetes, urinary incontinence, cardiovascular disease, etc.)

☐ **Impaired Vision** (cataracts requiring surgery, exam > 1 year ago, bifocals, macular degeneration, etc.)

☐ **Neurological Impairments** (Parkinsons, MS, stroke, peripheral neuropathy, brain injury, spinal stenosis, etc.)

☐ **Inadequate Diet** (progressive weight loss, dehydration, malnutrition, etc.)

☐ 3. **Objective Assessment**

☐ **Postural Hypotension**

- ☐ asymptomatic
- ☐ symptomatic

☐ **Pulse** (heart rate and rhythm problems)

- ☐ irregular
- ☐ tachycardia or bradycardia (>150 bpm, <50 bpm)

☐ **Pills/Medications/Substances** (prescription, over the counter, recreational)

- ☐ polypharmacy (>4 medications)
- ☐ alcohol intake
- ☐ medications of concern: benzodiazepines, analgesics, anticholinergics, antidiabetics, anticonvulsants, antihypertensives, antidepressants, antipsychotics

☐ **Pain** impacting on mobility

☐ **Problems with Gait, Balance or Mobility** (problems with transfers, endurance, balance, lower extremity strength, use of gait aid, etc.)

- ☐ TUG ≥14 seconds
- ☐ Romberg sign – present
- ☐ Five Times Sit-to-Stand Test >15 seconds
- ☐ altered gait
- ☐ reduced muscle strength/deconditioned
- ☐ unable to get out of a chair without using arms
- ☐ impact on ADLs

☐ **Problems with feet or footwear** (edema, toe/nail deformities, ulcers, weakness, inappropriate footwear, etc.)

☐ 4. **Cognitive Impairment** (forgetfulness, decreased judgment, etc.)

☐ 5. **Behaviour Risks** (impulsivity, low mood, apathy, changes in sleep, risk-taking behaviours, etc.)

☐ 6. **Environmental Hazards** (in/outdoors)

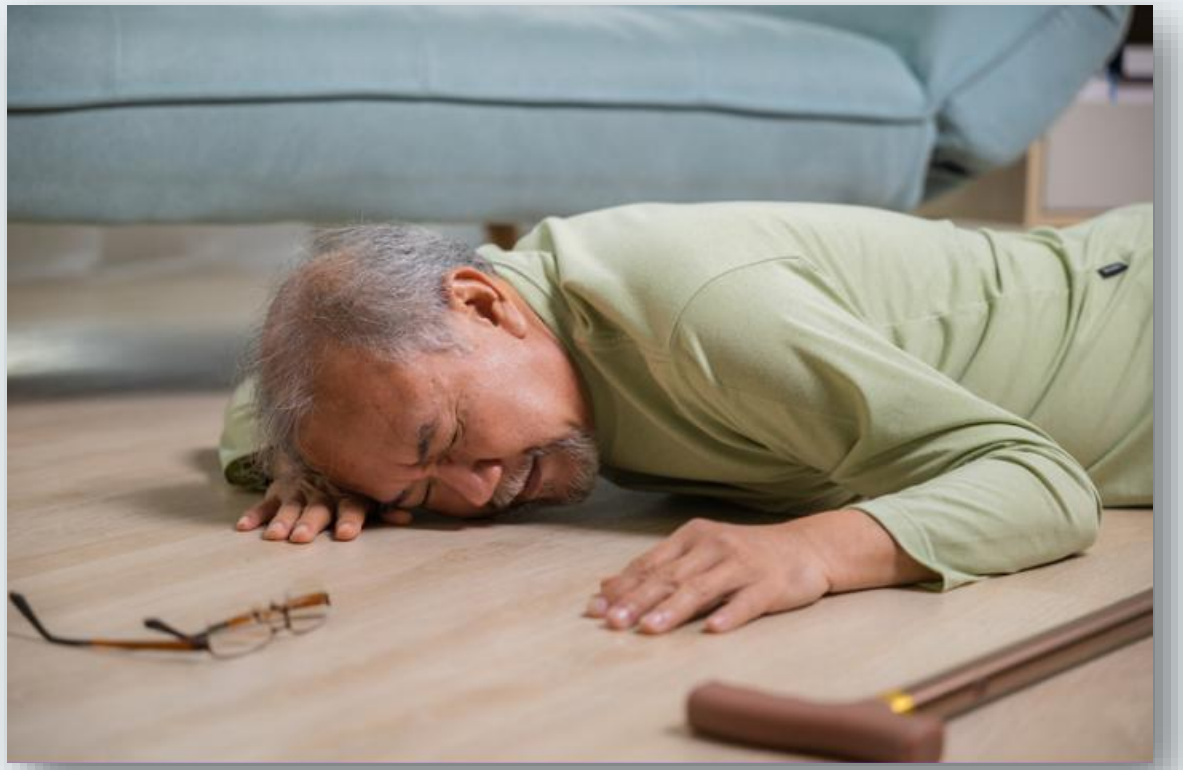
☐ 7. **Perceived functional ability/fear of falling** – contributing to deconditioning or curtailment of physical activities

Prevention and Protection – At Higher Risk for Low BMD or Future Fractures based on:

- ☐ history of low BMD
- ☐ prior fractures
- ☐ rheumatoid arthritis
- ☐ high alcohol intake (>3 drinks/day)
- ☐ smoking
- ☐ glucocorticoid use (prednisone = steroid puffers)
- ☐ significant kyphosis (suggests vertebral fracture)

MULTIFACTORIAL FALL RISK SUMMARY

- ❑A History of Falls:
  - Frequency – escalating?
  - Circumstances
    - ❑Time of day
    - ❑Location of fall
    - ❑Events leading up to fall
    - ❑Any LOC? Any loss of balance?
    - ❑Mental status – alert, groggy, dizzy
    - ❑Environmental hazards
    - ❑Use of mobility aid
    - ❑Injury
    - ❑Sought medical attention



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MULTIFACTORIAL FALL RISK SUMMARY

MEDICAL

- ❑ Acute or Fluctuating Medical Conditions and Symptoms

  For example:

  - –COVID-19
  - –Syncope
  - –Seizures
  - –Hypo/hyperglycemia
  - –Dizziness
  - –Light-headedness

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MULTIFACTORIAL FALL RISK SUMMARY

MEDICAL

- ❑ Chronic medical conditions

  For example:

  -Cardiovascular disease

  -Bladder and bowel problems

  -Arthritis

  -Diabetes

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MULTIFACTORIAL FALL RISK SUMMARY

MEDICAL

- ❑ Impaired vision (cataracts requiring surgery, bifocals, macular degeneration, etc.)
- ❑ Neurological impairments (Parkinson's, MS, stroke, peripheral neuropathy, brain injury, spinal stenosis, etc)
- ❑ Inadequate diet (progressive weight loss, dehydration, malnutrition, etc.)

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MULTIFACTORIAL FALL RISK SUMMARY

OBJECTIVE ASSESSMENT

- ❑ Pulse (heart rate and rhythm problems)
- ❑ Postural Hypotension
  - A decrease of ≥ 20 mm Hg (systolic BP) or ≥10 mm Hg (diastolic BP) within three minutes of standing

(MacDonald et al., 2016)

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POSTURAL HYPOTENSION

- Measure peripheral blood pressure and heart rate in the supine position and then after 1 and 3 minutes of standing.
    - older adult may be symptomatic or asymptomatic
    - many different causes

(MacDonald et al., 2016)

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MULTIFACTORIAL FALL RISK SUMMARY

Non-pharmacological:

- Arising from bed in 3 stages
- Pump ankles once sitting from lying
- Avoid large meals
- Avoid bending and standing quickly
- Avoid hot baths
- Avoid constipation – straining
- Use elastic stocking
- Elevate head of bed

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MULTIFACTORIAL FALL RISK SUMMARY

- Pills – prescription, over the counter, illicit, alcohol
  - Polypharmacy
  - Psychoactive medications (including sedatives, hypnotics, antidepressants, antipsychotics)
  - Digoxin, diuretics, antihypertensives, anticholinergic agents
  - Alcohol intake
  - Poor comprehension

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NOW WHAT?

Encourage older adults to ask questions about their medications:

- Have any medications been added, stopped or changed, and why?
- What medication do I need to keep taking, and why?
- How do I take my medications, and for how long?
- How will I know if my medication is working, and what side effects do I watch for?
- Do I need any tests and when do I book my next visit?

(Safe Medication Use, n.d.)

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MULTIFACTORIAL FALL RISK SUMMARY

- Pain – impacting on mobility

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PAIN ASSESSMENT

ONSET	When did it begin? How long does it last? How often does it occur?
PROVOKING/ PALLIATING	What brings it on? What makes it better? What makes it worse?
QUALITY	What does it feel like? Can you describe it?
REGION/RADIATION	Where is it? Does it spread anywhere?
SEVERITY	What is the intensity of the pain? (0n a scale of 0 to 10 with 0 being none and 10 being the worst possible) Right now? At best? At worst? On average?
TIMING/TREATMENT	Is the pain constant? Does it come and go? Is it worse at any particular time? What medications and treatments are you currently using? How effective are these? Do you have any side effects from the medications and treatments?
UNDERSTANDING/ IMPACT ON YOU	What do you believe is causing the pain? Are there any other symptoms with this pain? How is this pain impacting you and your family?
VALUES	What is your goal for this pain? What is your comfort goal or acceptable level for this pain? (On a scale of 0 to 10 with 0 being none and 10 being worst possible)? Are there any other views or feelings about this pain that is important to you or your family? Is there anything else you would like to say about your pain that has not been discussed or asked?

(Registered Nurses Association of Ontario, 2013)

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MULTIFACTORIAL FALL RISK SUMMARY

- ❑ Problems with Mobility/Gait/Balance
  - Reduced muscle strength
  - Deconditioning
  - Unable to get out of a chair without using arms
  - Impact on ADLs
  - Balance impairments
  - Altered gait
  - Use of gait aid

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MULTIFACTORIAL FALL RISK SUMMARY

- ❑ Problems with Mobility/Gait/Balance
  - Reduced muscle strength
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  - Impact on ADLs
  - Balance impairments
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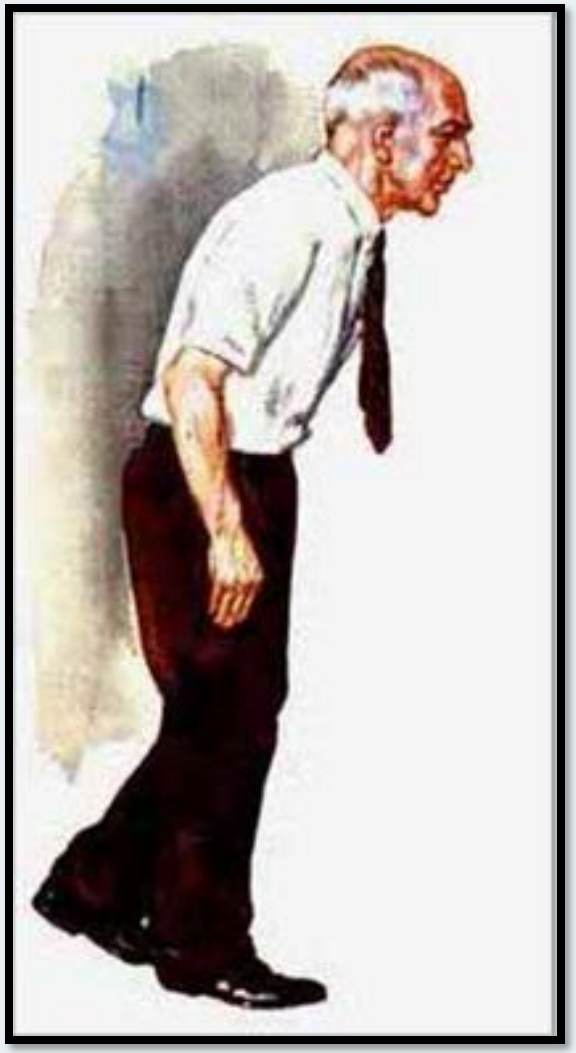
FUNCTIONAL ASSESSMENT



1. Timed Up and Go
2. Chair-Stand Test

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POLL

Have you ever heard of the Timed Up and Go?

Have you ever administered the Timed Up and Go?

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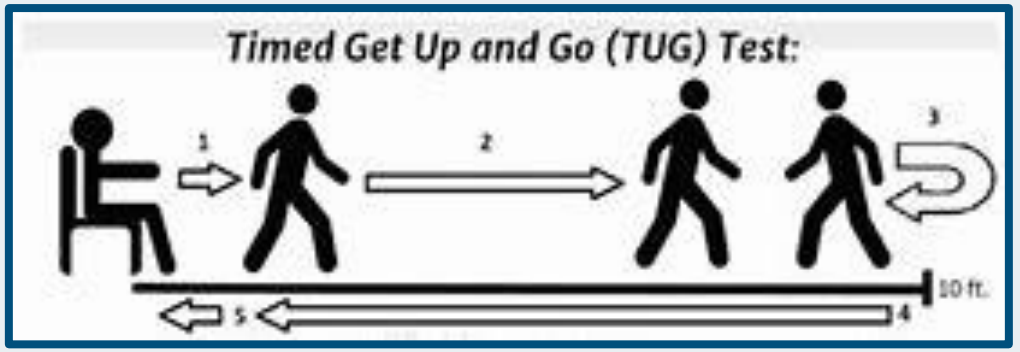
TIMED UP AND GO (TUG)

- Simple and practical performance measure of gait and balance
- Standardizes most of the “basic mobility” tasks
- Older adult is observed while he/she rises from a chair, walks 3 meters and returns to the chair
- Standardized cut-off scores to predict risk of falling
- A cut-off score of ≥ 13.5 seconds was shown to predict falling in community-dwelling frail elders

**TUG score for risk of falls is not valid with cognitive impairment



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TIMED UP AND GO (TUG)

Observe Rising from Chair

- watch the speed of rising
- does the older adult need assistance or a boost?
- does the older adult lean forward on rising?
- are you worried the older adult might fall?

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TIMED UP AND GO (TUG)

Observe Standing

–what is the older adult's stance?

–does the older adult lean to one side?

–does the older adult sway?

–does the older adult have any balance problems?

–are you worried the older adult might fall?

–check for postural abnormalities

–does the older adult complain of pain standing still?

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TIMED UP AND GO (TUG)

Observe Walking

- watch the height and width of the steps
- are steps irregular?
- can the older adult maintain balance while walking?
- are you worried the older adult might fall?
- look for asymmetric arm swing, abnormal arm and hand postures, and instability of the trunk

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TIMED UP AND GO (TUG)

Observe Turning

- watch the speed of turning, steadiness and number of foot placements needed to complete the turn.
- are you worried the older adult might fall?

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TIMED UP AND GO (TUG)

Observe Sitting Down

–is descent smooth?

–is the speed of descent normal?

–does the older adult lean forward to sit?

–does the older adult need to hold onto the chair?

–are you worried the older adult may fall?

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POLL

Have you ever heard of the Chair-Stand test?

Have you ever administered the Chair-Stand test?

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CHAIR-STAND TEST

- Assesses leg muscle strength, balance and endurance
- Older adult cannot use arms (arms are crossed on the chest)
- Ask older adult to stand up to a full standing position and then sit back down again

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LET'S TRY IT!

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30 SECOND CHAIR-STAND TEST

AGE	Men Number of Stands	Women Number of Stands
60-64	14-19	12-17
65-79	12-18	11-16
70-74	12-17	10-15
75-79	11-17	10-15
80-84	10-15	9-14
85-89	8-14	8-13
90-95	7-12	4-11

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FIVE-TIMES SIT TO STAND

- Optimal cut-off time for predicting recurrent fallers is 15 seconds.
- Estimate cut-off values for normal performance in community-dwelling older adults:
    - 60-69 years: 11.4 seconds
    - 70-79 years: 12.6 seconds
    - 80-89 years: 14.8 seconds

(Buatois et al. 2008, 2010)

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FIVE-TIMES SIT TO STAND

Traditional 5x Sit-to-Stand Test

AGE	MEAN
90-91	15.9s
92-94	16.5s
>95	18.8s
Overall (90+)	16.5s

Modified 5x Sit-to-Stand (use of hands)

AGE	MEAN
90-91	20.8 s
92-94	23.1s
>95	25.0s
Overall (90+)	22.8s

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MULTIFACTORIAL FALL RISK SUMMARY

- ❑ Feet (toe/nail deformities, ulcers, weakness, edema)
- ❑ Footwear (inappropriate)

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MULTIFACTORIAL FALL RISK SUMMARY

- ❑ Cognitive impairment
- ❑ Low mood or behavior risks
- ❑ Perceived functional ability/Fear related to falling

MULTIFACTORIAL FALL RISK SUMMARY

- Environmental Hazards

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HOME SAFETY CHECKLIST

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MULTIFACTORIAL FALL RISK SUMMARY

- Prevention and Protection: higher risk for low BMD, future fractures and falls based on:
  - history of low BMD
  - high alcohol intake (>3 drinks/day)
  - significant kyphosis (suggests vertebral fracture)
  - prior fractures
  - smoking
  - rheumatoid arthritis
  - glucocorticoid use (prednisone + steroid puffers)

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STAYING INDEPENDENT CHECKLIST

Are You at Risk for Falls?

Champlain Region Patient, Family and Caregiver Education Program

Falls are the main reason why older people lose their independence.

✔ Check your fall risk with the **Staying Independent Checklist.**

✔ Use this checklist every year and discuss changes with your doctor.

More information:
Your local public health agency, champlainhealthline.ca or stopfalls.ca

Primary Care Providers: for screening, assessment and program resources, please go to stopfalls.ca

PED 7 (03/2019)

Complete the Staying Independent Checklist

Please circle "Yes" or "No" for each statement below.			Why it matters
Yes (2)	No (0)	I have fallen in the last 6 months.	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 medicine 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 or health-care provider.**	

This checklist was developed by the Greater Los Angeles VA Geriatric Research Education Clinical Center and affiliates and is a validated fall risk self-assessment tool (Rubenstein et al. J Safety Res; vol. 42, n°6, 2011, p. 493-499). Adapted with permission of the authors.

Notes: _____

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IMPRESSION




Goal of the assessment is to identify and address ***modifiable*** risk factors



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IMPRESSION AND ANALYSIS

Putting the pieces together!

Biological

Behavioural

Environmental

Socio-economic

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INTERVENTIONS

Recommendations to Primary Care Provider

- Lab Work / CT / X-rays /BMD Test as indicated
- Medication Review- minimization & modification (psychoactive and antipsychotic meds in particular)
- Vitamin D supplementation
- Pain management
- Management of osteoporosis- (pharmacotherapy for older adults at high risk for major osteoporotic fracture)
- Optimization of vascular risk factors
- Management of heart rate and rhythm problems
- Management of foot and footwear problems
- Management of vision/hearing impairment
- Further review of cognition/mental health

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INTERVENTIONS

Recommendations to Older Adult

- Education re: fall prevention, postural hypotension, assistive devices
- Adaptation/modification of home environment
- Exercise program targeting strength and balance
- 150 minutes of physical activity per week
- Clothing and footwear modifications
- Modification of diet, hydration and nutrition
- Socialization/counselling
- Further pelvic health support (Kegels, reducing bladder irritants, behavioural intervention)
- Health management (annual vision test, good sleep habits, chronic disease self-management, annual medication review)

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24-Hour Movement Guidelines

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EXERCISE RECOMMENDATIONS

- Older adults can be classified as non-frail, pre-frail or frail

- **Non-frail adults:** follow the Canadian Physical Activity Guidelines for Older Adults
  - Take part in at least **2.5 hours (150 minutes) of moderate to vigorous intensity aerobic activity each week**.
  - Spread out the activities into sessions of **10 minutes** or more.
  - It is beneficial to **add muscle and bone strengthening activities** using major muscle groups **at least twice a week**.

(Canadian Society for Exercise Physiology, 2021)

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EXERCISE RECOMMENDATIONS

- Pre-frail and frail older adults: should perform various exercise modalities that include: **aerobic, resistance, balance and flexibility activities.**

- **Pre-frail** (exhibit 1-2 physical deficits): 3x/week for 45-60 minutes per session (135-180 minutes weekly)

- **Frail** (exhibit 3 or more physical deficits): 3x/week but for a shorter duration, 30-45 minutes. (90-135 minutes each week)

(Bray et al., 2016)

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INTENSITY IS THE KEY!

Even for pre-frail and frail older adults:

Exercise should start at **MODERATE** intensity, but progress to a more **MODERATE-VIGOROUS** intensity.

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"Exercise is the medicine to reverse or mitigate frailty, preserve quality of life, and restore independent functioning in older adults at risk of frailty."

(Bray et al., 2016)

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EXERCISES

Strength : exercises need to be *progressive*

Balance : exercises need to be *challenging*

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All types of exercises can reduce falls by 23% compared to inactive controls

(Doi.org/10.1186/s12966-020-01041-3)

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GAIT AIDS

Reduce - falls

Improve - stability and safety
- endurance
- gait
- function
- quality of life

WHAT TO CHOOSE?

Choose a cane for:

- –pain relief
- –light joint support
- –light balance and mobility support

Choose a walker for:

- –moderate balance or postural concerns
- –weakness
- –pain
- –limited energy

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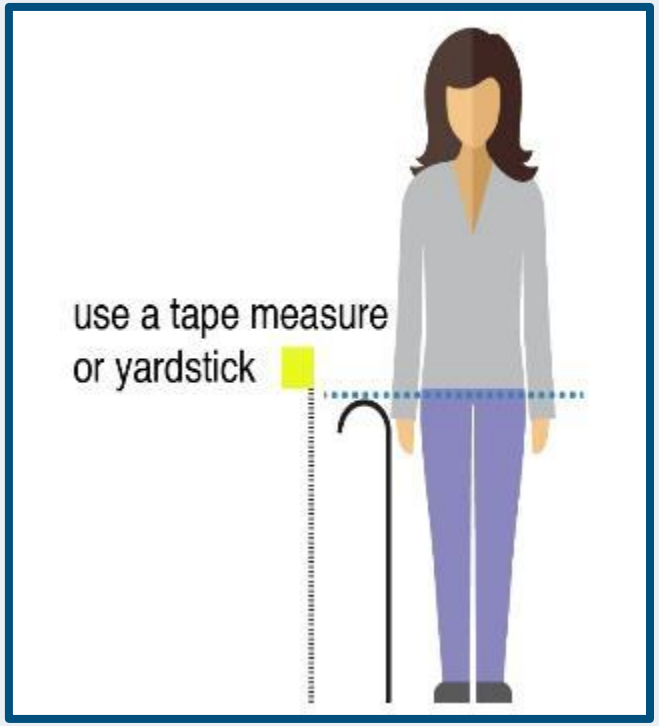
HOW TO MEASURE A CANE OR WALKER

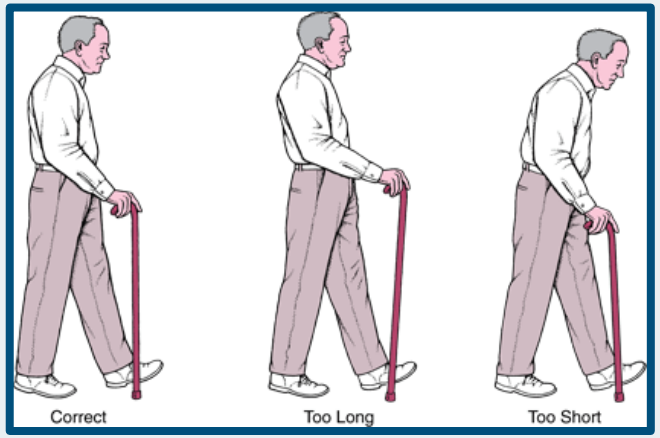
Handle height = wrist level

- with arm straight at side

Which hand for a cane?

- for pain relief or joint support, hold *opposite* the weak side
- for balance typically *dominant side* is easier





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TIPS FOR USING A WALKER SAFELY

THE BRAKES:

Before getting up, the brakes must be locked (push down)

GETTING UP:

Push up from chair or bed then transfer hands to walker

WALKING:

Standing tall, push the walker forwards and walk stepping between the back wheels with each step

SITTING DOWN:

Walk to chair or bed, turn around and back up with walker until legs touch the seat, lock walker brakes, reach for chair/ support and sit down

USING WALKER SEAT:

Brakes must be locked (push down to lock); for extra safety walker can be positioned against a wall; hold on to walker while turning to sit. Meant only for taking rests, not for transportation

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"Those who think they have not time for exercise will sooner or later have to find time for illness."

Edward Stanley (1826-1893)

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THANK YOU!

QUESTIONS?

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