



Physical Fitness and Mobility: Why it's important to keep moving

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We're all getting older but...

- That doesn't necessarily mean we're getting worse
- By becoming physically active, you can make improvements to your health to enable you to live with fewer health problems and chronic conditions



Physical Activity and Aging

You can live a more vibrant, independent, and healthy life regardless of your age BUT there is no magic bullet!



No Magic Bullet

A Healthy Lifestyle including healthy eating, physical activity, and regular exercise will go a long way to help you become more physically fit and better able to handle life's challenges!



The Aging Curve

As we age our physical capacity declines in all our systems which affect:

- Strength
- Cardiovascular “aerobic” endurance
- Balance
- Flexibility

All show distinct patterns of change during the aging process

These changes can negatively affect our lives to varying degrees

You can use exercise, especially targeted exercise prescriptions to bend the aging curve upward so that the decline is not so dramatic

Extending the Healthy Years

- Cannot prevent frailty and decline in our more senior years
- BUT through regular Physical Activity and Exercise and healthy eating, we can reduce the amount of time spent in frailty in those last years
- By “bending the aging curve” we are extending the time spent in a healthy and independent state
- Even with some level of frailty or chronic condition, regular physical activity and exercise can help to maintain what you’ve got and even help you gain more independence

Mobility and Independence

- There is a direct relationship between mobility and independence
- There are many causes of immobility
- Many are out of our control but many we can control—at least to some degree
- By doing our best to improve mobility we’re “ahead of the curve ball”



I’d rather just sit and relax!



- Two-third of older adults are inactive
- Sitting or lying for long periods is a serious health risk (World Health Organization)
- Inactivity leads to declines in:
- bone strength
 - muscle strength
 - heart and lung fitness
 - flexibility
- Inactivity is as harmful to your health as smoking!

Benefits of Physical Activity

Physical Activity provides significant health gains and benefits throughout the lifespan



To realise these benefits, physical activity must be **REGULAR**--a part of your life every day

Falls

- One third of adults 65+ suffers at least one fall each year
- Nearly half of these people fall more than once
- Exercise is one of the most important thing you can do to help prevent falls



Falls

- Major threat to independence
- Injuries resulting from falls
 - bruises
 - sprains
 - head injuries
 - fractures
- Causes often complex combination of physical health and environmental hazards
- Majority of falls occur in walking, turning, climbing stairs, or changing positions



Risk Factors for Falls

Intrinsic Factors:

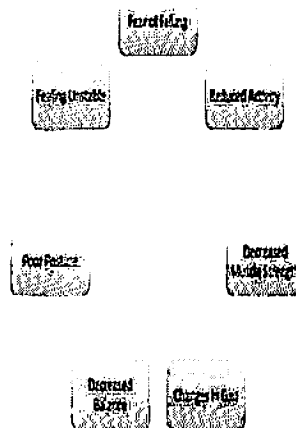
- Older Age
- Muscle Weakness in Legs
- Poor Balance and Gait
- Reduced reaction time
- Poor or impaired vision
- Poor or impaired hearing

Risk Factors for Falls

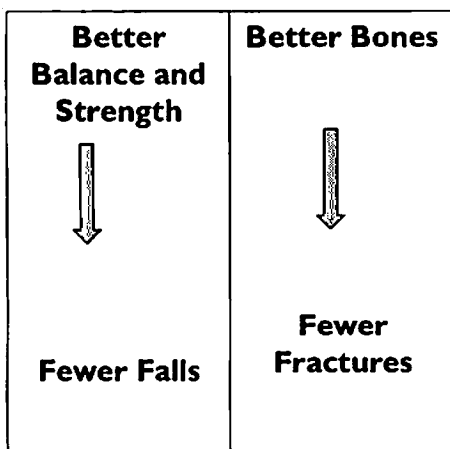
Extrinsic Factors

- Risky Environment (e.g. tripping hazards, inadequate lighting)
- Personal habits (e.g. inappropriate footwear, refusal to use walking aids)

The Vicious Cycle

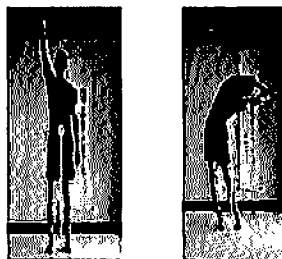


Falls and Fractures



Balance

- Ability to maintain the *centre of mass* over the *base of support*
- One becomes unbalanced when centre of mass moves *outside* the base of support



Posture and Control

- Good posture critical to good balance

Posture Check!

- Anticipatory postural control is the advanced planning of actions, to avoid obstacles in our path as we travel
- Reactive postural control are actions that cannot be planned in advance because of an unexpected event

Factors affecting balance

- Size of Base of Support
- Movement of the Centre of Mass outside the Base of Support (postural sway) Increases with Age
- Altered sensory input (3 systems of balance)
- Changes to the nervous system (slowing of information processing)
- Certain diseases such as Parkinson's Disease can impair posture, balance, and mobility
- Reduced muscle strength (esp. those surrounding hip, knee, ankle)

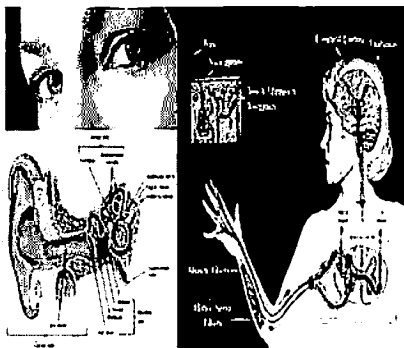
Systems involved in Balance

Cognitive Sensory Motor



Three Sensory Systems involved in balance

Multiple systems help us maintain balance in standing and moving environments:
Visual, Vestibular, Somatosensory (Proprioceptive)



Three Motor Systems involved in Balance

- Muscle Strength
- Muscle Endurance
- Muscle Power



Cognitive System

- Link between mental (cognitive) and physical is strong when it comes to anticipatory balance
- Need to think quickly and logically to negotiate around objects that could trip you up or cause you to lose balance and fall
- Need to think clearly about how to avoid tripping hazards, distractions, etc.



Age-Related Changes to Sensory Systems

- Changes to vision, visual impairment
- Changes to inner ear (thickening of fluid, damage to cilia, etc.)

Age-Related Changes to Motor System

- Muscle mass decreases
- Fat mass increases
- Fast-twitch muscle fibres decrease the fastest

Age-related Changes to Cognitive System

- Cognitive impairment increases with age
- Impairment of attention, memory, and intelligence will affect ability to anticipate and adapt to changes occurring in environment

Changes to Gait

- Gait abnormalities - problems in performing basic tasks of walking which may have resulted from muscle weakness and joint stiffness
- Pattern of shorter, broader strides, limited ankle movement, longer time when both right and left feet are in contact with ground
- Since gait abnormalities increase risk for falls, lower body strengthening is crucial (esp. muscles surrounding hip, knee, ankle)

Can Age-Related Changes in Balance and Mobility be Reversed?

- Growing evidence suggests that rate of decline can be reversed or at least declined in some or all of these systems



- Intervention: sources of balance-related problems and expose older adults to changing task demands and environmental constraints have been effective

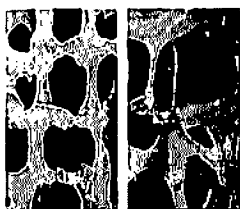
Quiz!!!

Put the following activities in correct order, from easiest to hardest in terms of balance:

1. Sitting in a chair
2. Walking with a cane or walker
3. Getting up from a chair
4. Stopping/starting while walking
5. Climbing stairs
6. Picking up an object from the floor while seated
7. Turning while walking
8. Standing on the spot
9. Picking up an object from the floor while standing
10. Walking with no assistive devices

Bones and Mobility

Osteoporosis-the silent disease



Healthy Bone

Osteoporosis Bone

Osteoporosis-What is It?

- Disease that affects your bones, thinning and weakening them, making them more likely to break or fracture
- Low bone mass main characteristic
- Often called the "silent thief" because bone loss can occur without your even knowing it or feeling anything
- Bone loss does not occur overnight but over the course of several years
- Sometimes the first sign anything is wrong is a broken bone

www.osteoporosis.com

Osteoporosis-How do you "get it"?

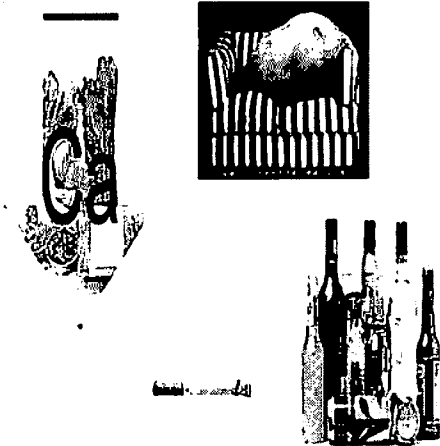
- No single cause identified
- Number of Risk Factors that can contribute to this condition
- In women, bone loss can occur quite rapidly in the first 5 to 10 years following menopause due to the decline in estrogen
- In men, a more gradual decrease in bone density from age 30 onward, often made worse if/when testosterone levels have declined

What are the risk factors? Things you can't control



- or surgically induced menopause
- Absence of menstrual periods (for abnormal reasons)
- Low testosterone levels in men (unless medically)
- Being Caucasian or Asian (although African Americans and Hispanic Americans can still be at risk)

Risk Factors you can control



Osteoporosis and Fractures

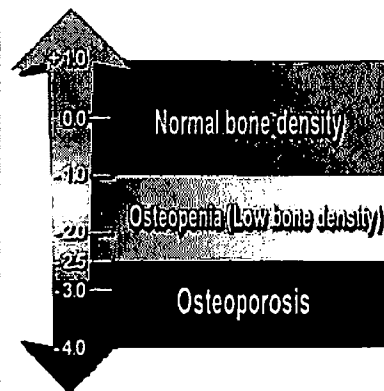
- Over 80% of all fractures in people over age 60 are related to *osteoporosis*
- Thirty percent of hip fracture cases result in death and 23% of patients who suffer a hip fracture die within one year
- Illnesses or disability requiring immobility for extended amounts of time results in a dramatic loss of bone
- Not all vertebral fractures are due to osteoporosis. But when the disease is involved, a fracture is often a patient's first sign of a weakened skeleton from osteoporosis

While osteoporosis is generally painless, fractures that can result from it are not!

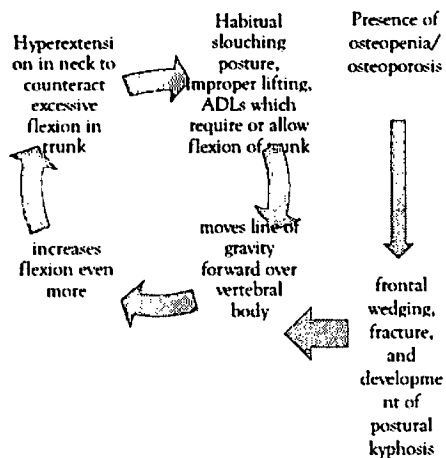
How do Fractures Occur?

- Abnormal force on a Normal Bone
- Normal force on an Abnormal Bone
- Osteoporosis is Abnormal Bone!

T-Scores



Two Sources of Trouble



Can Osteoporosis be Reversed?

Technically No...But

Outcomes can be improved, bone density loss can be slowed and bone can be strengthened so that there is **less risk of fracture**

Medication (if necessary), increased uptake of Calcium and Vitamin D, increased Physical Activity and Exercise will all help improve your chances of avoiding fractures and so will fall prevention!

If you have Osteoporosis, what should be your exercise goals?

- Strengthen bone safely
- Decrease rate of bone loss (this is minimal)
- Decrease risk/rate of fractures
- Decrease risk/rate of falls
- Improve posture (think muscle!)
- Improve overall health

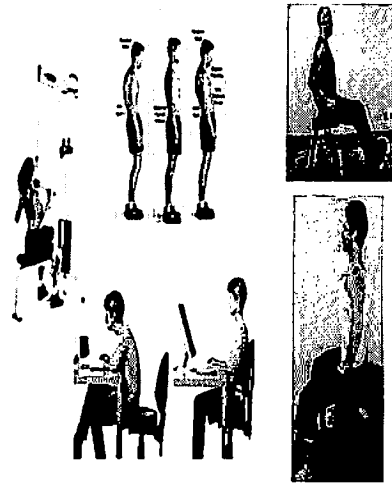
Types of Exercises to Include

- Weight Bearing
- Strength Building
- Posture
- Balance Specific
- Leg Strengthening
- Core Strengthening
- Speed and Agility

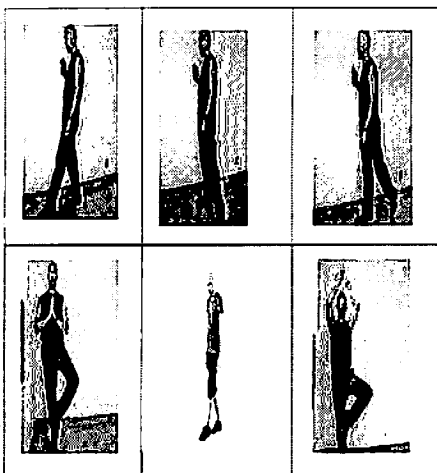
Weight Bearing



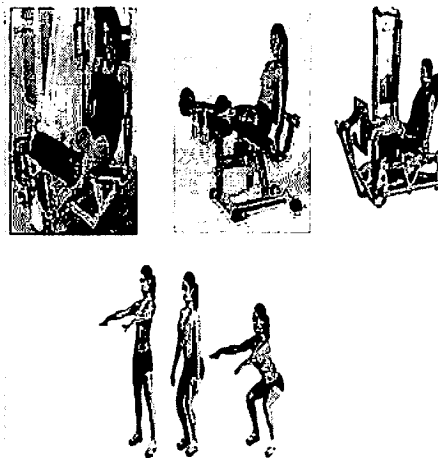
Posture



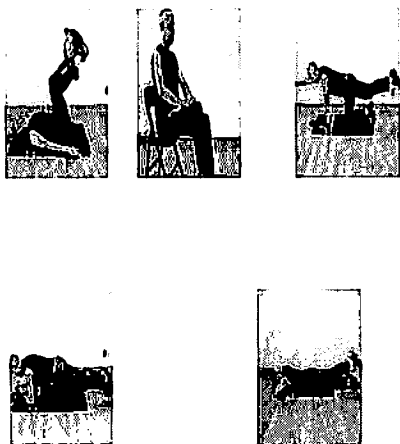
Balance Specific



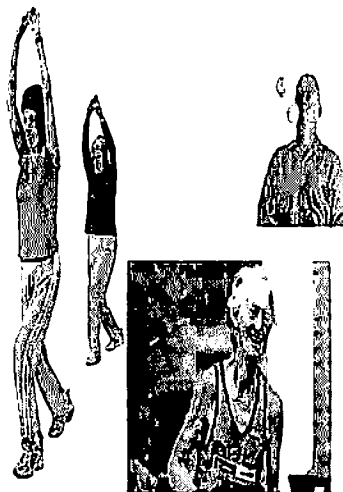
Leg Strengthening



Core Strengthening



Speed, Agility, and Coordination



Can Exercise Be Bad For You?

- Exercise, in general, is not bad but specific exercises and movements may be bad for you, depending on the severity and location of osteoporosis.
- The same can be said about exercise and other chronic conditions, such as arthritis, coronary heart disease, hypertension, Diabetes.
- As with any chronic condition, talk to your doctor first before becoming much more physically active (esp. if you are beginning an exercise program after having been generally sedentary)

But Can't I Hurt Myself if I exercise?




Yes, but...

With some guidance, you can exercise in a safe and comfortable manner that will allow you to get stronger, become more mobile, and maintain your independence!

Exercises and Movements to Avoid

- Double Leg Lift
 - Try Lying Abdominal Crunch
- Sit-ups (esp. w hands behind)
 - Try Partial Curl-up, hands
- Forward Bending
- Side-bending
- Trunk Twisting, esp. loaded spine
- High impact



Exercises and Movements to Avoid: Unsafe Stretches

- Standing Toe Touches
- Full Neck Circles
- Knees to Chest with rotation



Classes/Practices to Avoid or Modify

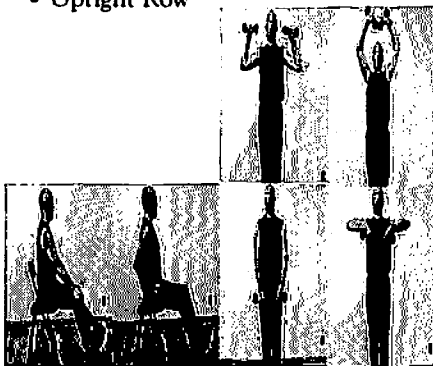
- High Impact Aerobics
- Kick-boxing/Tai bo
- Certain Yoga Postures—hand/head/shoulder stands, Triangle Series—do shoulder bridge instead and not too high
- Certain Pilates Postures—Spinal Twists, The Hundred, The Roll-over—modified hip twist, modified 100

How Can These Activities Be Modified?

- Golf swing
- Shoveling
- Taking clothes out of dryer
- Forward bending (tying of shoes)
- Vacuuming

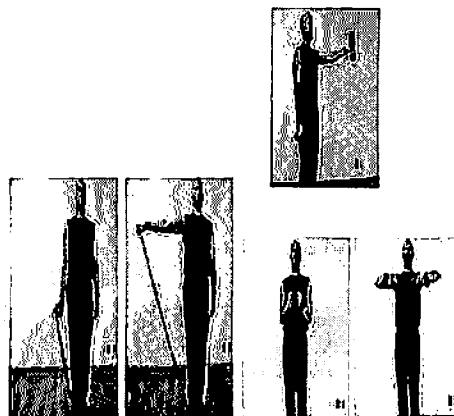
Exercises that are Good

- Seated Row
- Overhead Press
- Upright Row



Exercises that are Good

- Shoulder Front Raises
- Shoulder Side Raises



Exercises that are Good

- Squats
- Sit to Stand
- Side leg raises
- Heel and Toe raises



Conclusion

A few tips from Canada's Physical Activity Guidelines for Older Adults:

- Pick a time, pick a place, make a plan and move more!
- Now is the time. Walk, run, or wheel, and embrace life.

Thank You!