

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

by Chris Moffett
Certified Personal Trainer, Fitness Instructor, and Older Adult
Fitness Specialist



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



© 2012 Shutterstock

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



© 2012 Shutterstock

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 Balance of Good Health



© 2012 Shutterstock



The Aging Curve

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

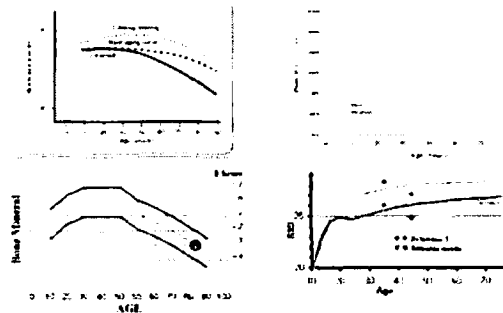
- Strength
- Cardiovascular "aerobic" endurance
- Balance
- Flexibility

All show distinct patterns of change during the aging
process

These changes can negatively affect our lives to varying
degrees

© 2012 Shutterstock

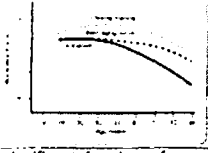
The Aging Curves



© 2012 Shutterstock

And now the good news!

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



- There still will be a significant drop in performance with age but people who exercise regularly will have a curve that begins at a much higher level than an untrained person
- Decline will often place the exercising person at a level equivalent to an untrained individual many years younger!

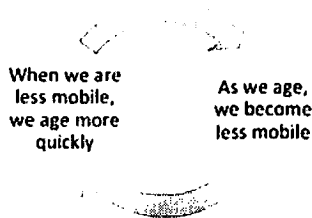
© 2008 Pearson Education, Inc.

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

© 2008 Pearson Education, Inc.

Aging and Mobility



Can we break this vicious cycle?

© 2008 Pearson Education, Inc.

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”



© 2008 Pearson Education, Inc.

Physical Activity and Independence

People who are physically active on a regular basis, *especially if they exercise at a level of intensity appropriate for their current state of health and fitness*, are generally more independent and live healthier lives than sedentary and frail individuals

© 2008 Pearson Education, Inc.

I'd rather just sit and relax!



- > 2/3 of older adults are inactive (more recent studies have shown this to be 66%)
- > 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!

© 2008 Pearson Education, Inc.

Aging and Inactivity

Physical *inactivity* makes your body age faster and can rob you of your independence

- "Independent living depends on being able to do the things you want to do when you want to do them."
- "To stay independent you need to be able to reach, bend, lift, carry, and move around easily."
- "Staying physically active will help you to keep moving, and stay strong."

-Canada's Physical Activity Guide for Older Adults

Aging and Physical Activity

Maintain your health and independence as you age

- Physical activity is one of the most important things you can do to maintain your physical and mental health and quality of life as you get older.
- Walking, stretching, and keeping your muscles in good condition will help you to maintain your independence.

-Canada's Physical Activity Guide for Older Adults

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

Building Physical Activity into your life

Be aware of modern conveniences. They give **AND** they take away!

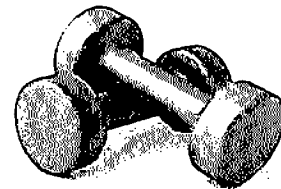


Building Physical Activity into your life



- Use handrail for safety only -- touch handrail, don't haul yourself up
- Park further away from store entrance
- Walk to stores instead of drive
- Any other suggestions?

Exercise Break



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

© 2019 Johns Hopkins

48

Falls

- Major threat to independence
- Injuries resulting from falls include
 - bruises
 - sprains
 - head injuries
 - fractures
- Causes often complex combination of physical health (e.g. balance system impairment, medications) and environmental hazards (tripping and slipping hazards)
- Majority of falls occur in walking, turning, climbing stairs, or changing positions



© 2019 Johns Hopkins

49

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

© 2019 Johns Hopkins

50

Risk Factors for Falls

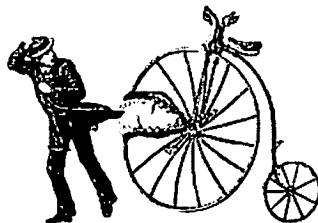
Extrinsic Factors

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

© 2019 Johns Hopkins

51

Fear of Falling

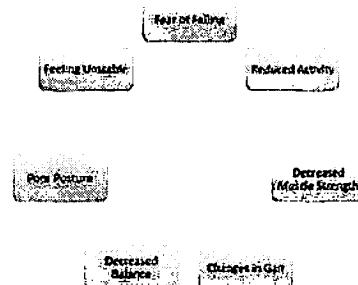


A VICIOUS CYCLE

© 2019 Johns Hopkins

52

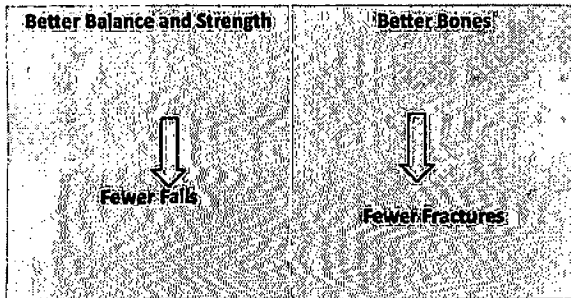
The Vicious Cycle



© 2019 Johns Hopkins

53

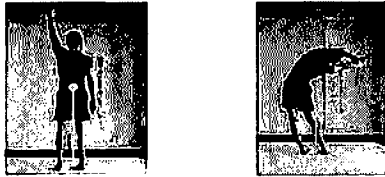
Falls and Fractures



Balance

- Ability to maintain the *centre of mass* (CoM) over the *base of support* (BoS)
- One becomes unbalanced when centre of mass moves *outside* the base of support
- *Base of support* is area surrounding body parts contacting supporting surface
- *Centre of mass* is the point around which an object's mass is equally distributed (a.k.a. balance point)

Center of Mass Base of Support



Posture and Control

- Good posture critical to good balance
- 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 CoM outside the BoS (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)

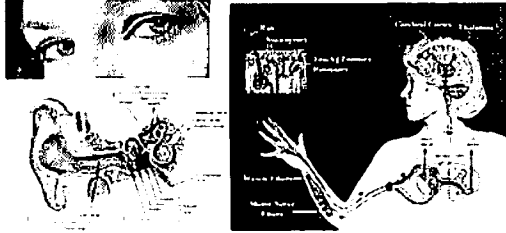
Systems involved in Balance

Sensory Motor Cognitive



Three Sensory Systems involved in balance

Multiple systems help us maintain balance in standing and moving environments



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



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 result 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



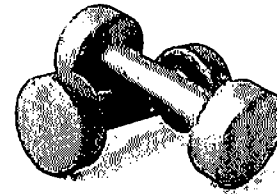
- Interventions that target the sources of balance-related problems and expose older adults to changing task demands and environmental constraints have been effective

Quiz!!!

Put the following activities in correct order, from easiest to hardest only 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

Exercise Break



Bones and Mobility

Osteoporosis-the silent disease



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 you 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

Osteoporosis-How do you "get it"?

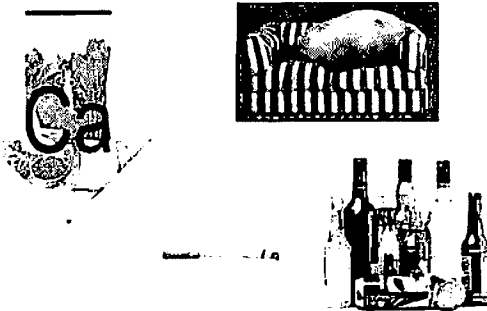
- No single cause identified
- Number of Risk Factors that can contribute to this condition
- In women, bone loss can occur quite rapidly in the first 5 to 10 years following menopause due to the decline in estrogen
- In men, a more gradual decrease in bone density from age 30 onward

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

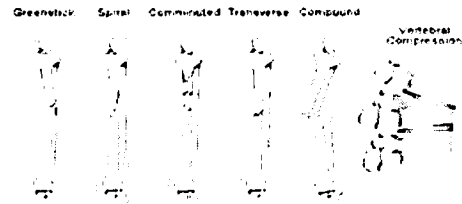


- Being postmenopausal, including early or surgically induced menopause
- Absence of menstrual periods (for abnormal reasons)
- Low testosterone levels in men
- Being Caucasian or Asian (although African Americans and Hispanic Americans can still be at risk)

Risk Factors you can control



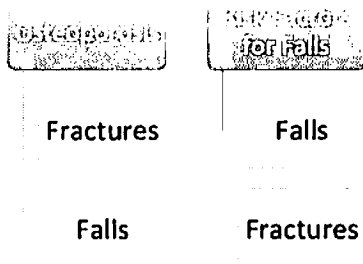
Osteoporosis and Fractures



Typical Bone Fractures

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

Fractures and Falls

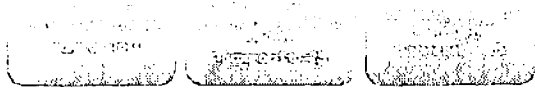


How do Fractures Occur



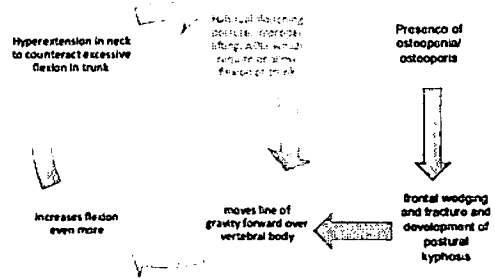
Osteoporotic Bone is Abnormal Bone

Continuum of bone health



© 2009 American College of Sports Medicine

Two Sources of Trouble



© 2009 American College of Sports Medicine

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!

© 2009 American College of Sports Medicine

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

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

© 2009 American College of Sports Medicine

Types of Exercises to Include

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

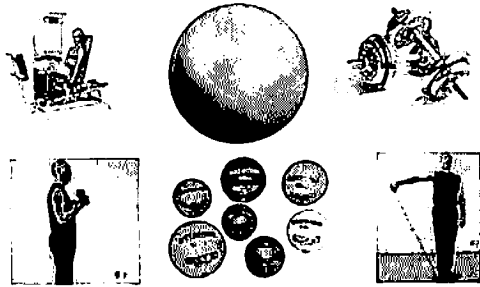
© 2009 American College of Sports Medicine

Weight Bearing



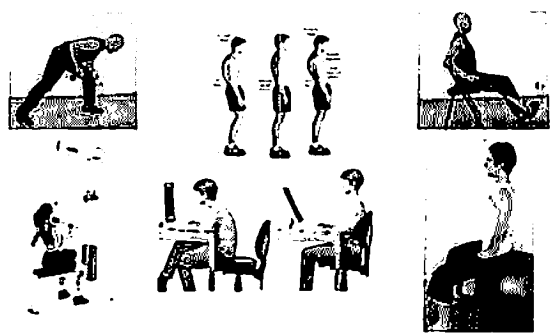
© 2009 American College of Sports Medicine

Strength Building



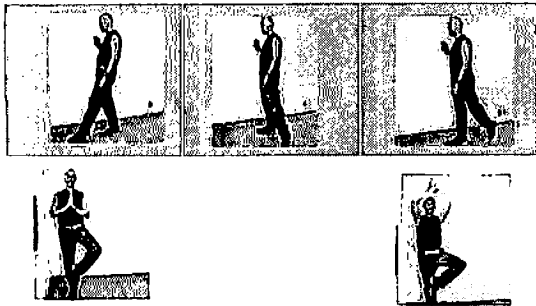
11/11/2023

Posture



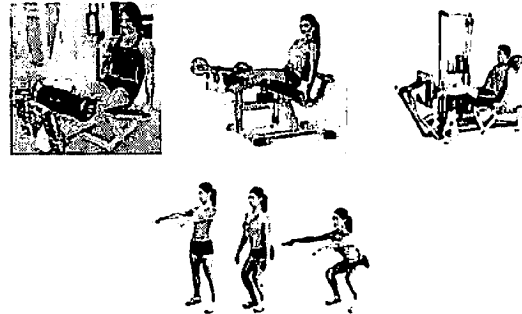
11/11/2023

Balance Specific



11/11/2023

Leg Strengthening



11/11/2023

Core Strengthening



11/11/2023

Speed, Agility, and Coordination

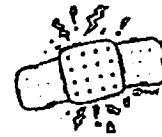


11/11/2023

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

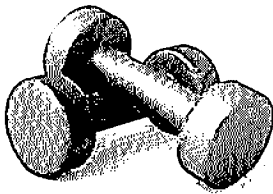
But Can't I Hurt Myself if I exercise?



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!

Exercise Break



Exercises and Movements to Avoid

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

Exercises/Machines to Avoid

- Chest Press (esp. seated)
- Bench Press (esp. with heavy weight)
- Pec deck (esp. with heavy weight)

Exercises and Movements to Avoid: Unsafe Stretches

- Standing Toe Touches
 - Try Lying Hamstring Stretches Instead
- Full Neck Circles
 - Try Hal-Neck Circles instead
- Knees to Chest
- Side Bends

Exercises/Machines to use with Caution

- Lat Pull-down
- Seated Knee Extension
- Seated Knee Curl
- Prone Knee Curl

Classes/Practices to Avoid or Modify

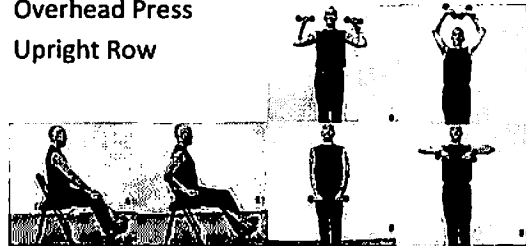
- High Impact Aerobics
- Kick-boxing/Tai bo
- Certain Yoga Postures—hand/head/shoulder stands, Triangle Series—do shoulder bridge instead and not too high
- Certain Pilates Postures—Spinal Twists, The Hundred, The Roll-over—modified hip twist, modified 100

How Can These Activities Be Modified?

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

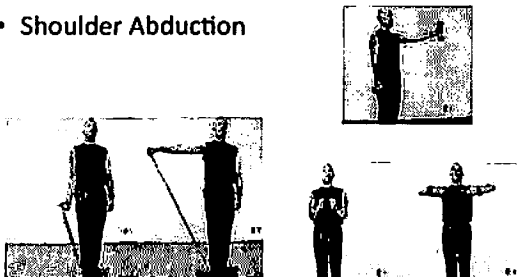
Exercises that are Good

- Seated Row
- Overhead Press
- Upright Row



Exercises that are Good

- Shoulder Flexion
- Shoulder Abduction



Getting from A to B: Safer Transitions

- Getting in/out of bed—use sideways or hand & knees method
- Getting in/out of car—swing method
- Sitting up in bed—do not sit up straight in bed, use sideways method instead
- Turning over in bed—treat body as one unit, if on R side, push left hand into the mattress, bend R knee and roll onto back. From your back, bend R knee, place R arm across chest and roll onto you left. Reverse for other way

Tips, Strategies, Resources

- Fitness Classes, Home Exercise Programs, getting outside help
- Web resources: osteoporosis.ca, diabetes.ca, arthritis.ca, heartandstroke.com, healthandbone.ca, stayingstrong.ca
- Action Plan series from Human Kinetics
- Helpful Organizations: CCAA, ALCOA, Canadian Physical Activity Guidelines

Conclusion

Remember the motto for Canada's Physical Activity Guide for Older Adults:

- Be Active, Your Way, Ever Day for Life!
- Incorporate Physical Activity into your life every day
- Now is the time. Walk, run, or wheel, and embrace life!

Thank You!