

Role of Mobility & Function in Preventing Common Illnesses

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Objectives



- Analyze the impact of decreased mobility on functionality and illness prevention
- Formulate a mobility plan to minimize the impact of preventable diseases associated with hospital readmissions

Aging



- “Aging is a continuous, complex, and dynamic process that begins with birth and ends with death. And unless we die in our early years, we will each grow old and experience the effects of the aging process”



AGE

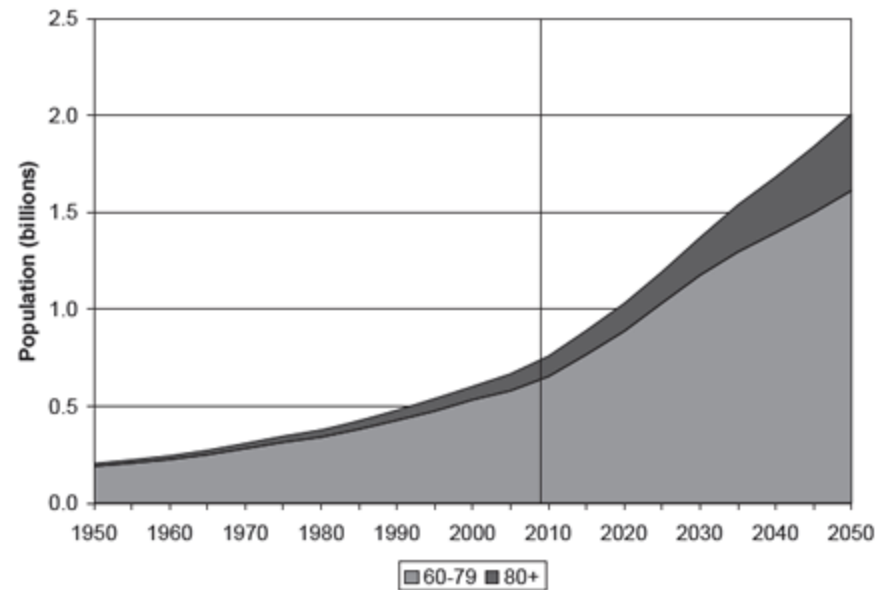
?

- Young Old = 57-74 yrs
- Middle Old = 75-84 yrs
- Old Old = 85-89 yrs
- Elite Old = 90+ yrs

Aging



- 12.4% of US population are 65 yrs & >
- 1 in 5 Americans will be 65 yrs by 2030
- 85+ yrs is the fastest growing population in the US



Aging



- Young Old (57-74 yrs)
 - First wave of Baby Boomers reached retirement in 2011
 - 74 million Baby Boomers will retire in the next 20 years
 - 10,000 new retirees added to Social Security & Medicare each day



So,

Why is a growing elderly
population important?

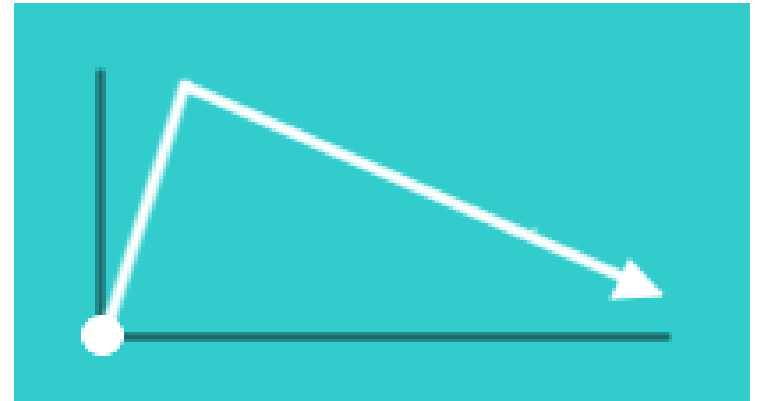


How are **YOU** doing
in the aging
process?

Aging Perceptions



- The Young's View
 - Functionality improves rapidly and peaks at age 25-30
 - Functionality declines after age 30 with gradual advancement to growing old and eventual death



Aging Perceptions



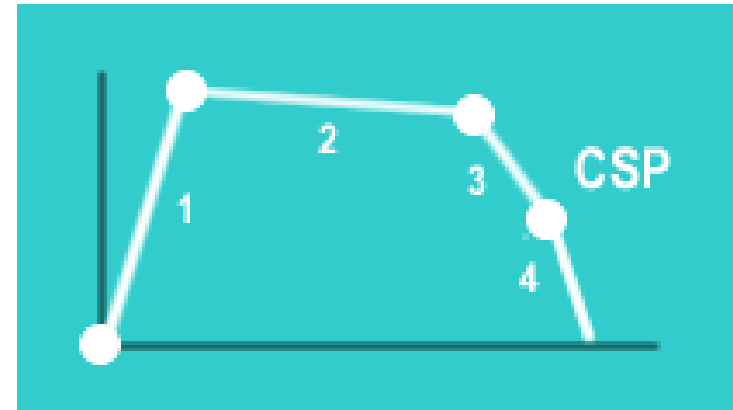
- The Old's View
 - Functionality steadily climbs from birth and peaks at age 65
 - Functionality declines after age 65 leading retirement and death



Aging Perceptions



- 4 Phase View
 - **Phase 1**
 - Period of rapid growth
 - **Phase 2**
 - Period of adult sustainment
 - **Phase 3**
 - Period of functional decline
 - **Phase 4**
 - Continued functional decline toward death



Aging Perceptions



- Critical Support Point
 - Become dependent on products & environment
 - Begin to compensate for functional decline
 - Require assistance to remain independent and continue functionality





Physiological Changes that Occur with Aging

Skeletal System Changes



- Facts

- Bone mineral decline begins in the 3rd decade
 - Typical decrease of 0.5% to 1.0% yearly
- Imbalance of basic metabolic unit (BUM) of bone
 - Increase osteoclastic activity vs. osteoblastic activity

- Effects on Function

- Increased risk for fracture in the immobile frail older adult
- Continued functional decline and immobility



Cardiovascular Changes

- Facts
 - ↓ maximum heart rate
 - ↑stiffness of myocardial tissue
 - ↓Vo₂max
 - @ 10% per decade
 - ↓cardiac output
 - ↓heart rate & stroke volume
 - ↓O² saturation
- Effects on Function
 - Decrease in aerobic capacity leading to
 - Immobility
 - Weight gain
 - Loss of independence
 - Inability to climb flight of stairs, etc.



Immune System Changes

- Facts
 - Immune system declines with age
 - Decline in immune function
 - Decline in immune response
 - Increase in systemic inflammation associated w/
 - Muscle wasting
 - Loss of function
- Effects on Function
 - Increased risk of infection
 - Pneumonia
 - Upper respiratory infections
 - Increased risk of hospitalizations
 - Further impact on functional decline

Muscular System Changes



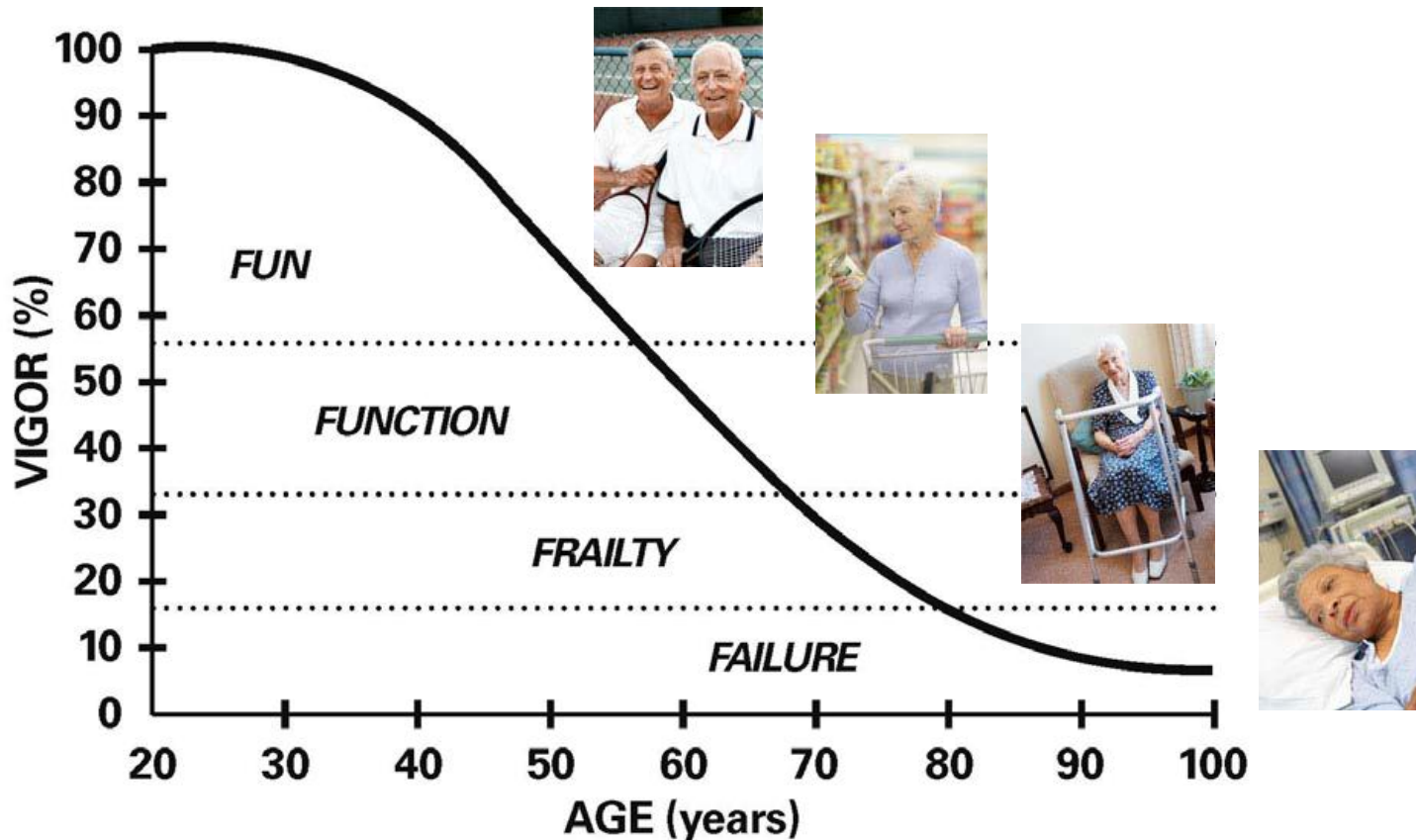
- Facts
 - **Sarcopenia** is the loss of
 - Muscle strength
 - Muscle power
 - Functional quality
 - Sarcopenia is prevalent by 6%-40% in individuals age 65 and older
 - Sarcopenia progresses at a rate of 1% to 3% after 50 years of age
- **Whole muscle changes**
 - ↓ muscle mass
 - ↓ muscle strength
 - Slowing of muscle contractility
- **Muscle fiber changes**
 - Fast twitch atrophy more than slow twitch
 - Fiber necrosis
 - Reduction in fast twitch muscle fibers

Muscular System Changes



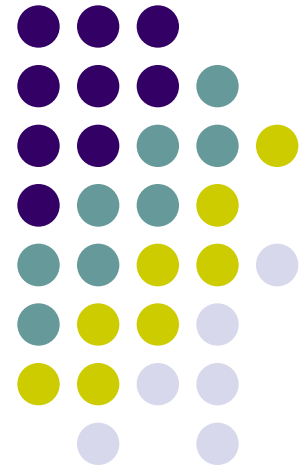
- Effects on Function
 - Sarcopenia contributes to
 - Deficits in mobility
 - Increased risk of falling
 - Decline in functional capacity
 - Increased risk of frailty
 - Reduction in skeletal muscle oxidative capacity
 - Decreased aerobic workload capacity

Slippery Slope of Aging



How can we help prevent the slippery slope of aging?

Through a balanced healthy lifestyle that includes **regular physical exercise!**



Benefits of Exercise



● Skeletal System

- Immobility & inactivity is a modifiable risk factor for skeletal decline
- Contracting muscles promote osteoblastic activity
- Weight bearing activity also promote increased bone mineral density
 - Resistance training and walking

● Cardiovascular System

- Lower HR at rest & submaximal exercise
- Vo_2 max increased w/ exercise training
- Exercise should not be limited due to cardiovascular decline
- Low-intensity levels of activity should be safely performed

Benefits of Exercise



- Immune System

- Moderate exercise has been shown to enhance immune function
- Exercise has been shown to decrease systemic inflammation
 - Reducing risk for disease
 - Delaying functional decline

- Muscular System

- Resistance training facilitates
 - Improved muscle strength
 - Improved muscle power
 - Improved functional mobility
- Promotes continued functional independence

Exercise & Immune Function



- Recent studies
 - Increased risk of pneumonia related deaths associated with limitations in daily activities
 - Women who exercise and walk more often are less likely to develop pneumonia
 - Physical activity is associated with a decreased risk of community-acquired pneumonia
 - Habitual physical activity has been shown to be related to decreased infection occurrence
 - Upper respiratory infections

Regular Exercise





Exercise Quiz

- How many hours of exercise should you complete a day?
- How many days a week should you exercise?
- How should you describe how hard you are working during exercise?
 - Low?
 - Moderate?
 - Vigorous?



Research Shows

- Minimally, exercise should be performed
 - 2 hours & 30 minutes a week (~30 min/day for 5 days)
 - Of moderate intensity
 - And aerobic in nature
- To reduce chronic disease risk factors

Exercise vs. Physical Activity

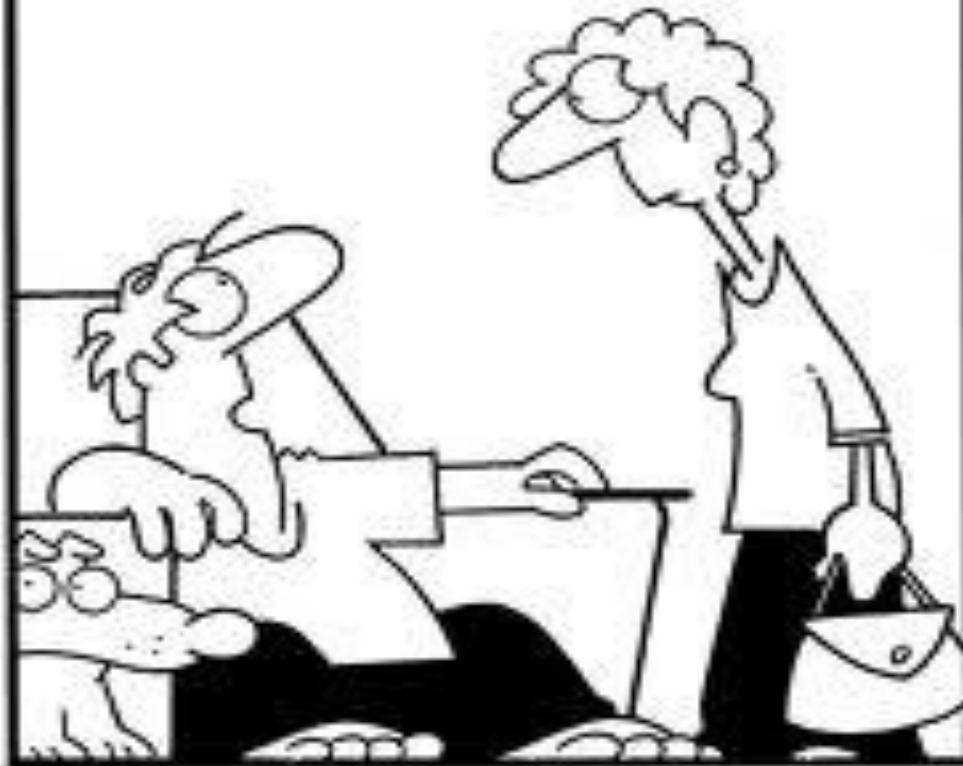


- Exercise
 - Planned
 - Structured
 - Repetitive
 - Goal of improving health and fitness

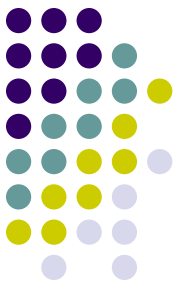
- So, not all physical activity is exercise!

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"I did a 30-minute workout today: 15 minutes looking for my sneakers, 10 minutes looking for my sweat pants and 5 minutes on the treadmill."





Exercise Components

- **Intensity**

- Describes how hard the person is exercising
 - Moderate
 - Vigorous

- **Frequency**

- How often the exercise is performed

- **Duration**

- The length of the individual exercise session

- **Repetitions**

- Number of times a specific exercise is performed

Exercise Component - Intensity



- **Moderate Intensity**

- Medium level of effort
- Noticeable increases in
 - Heart rate
 - Breathing rate

- **Vigorous Intensity**

- Large level of effort
- Large increases in
 - Heart rate
 - Breathing rate

- **Intensity Scale**

- **10** Maximum Effort
- **9**
- **8** Vigorous
- **7** Slightly Vigorous
- **6** Moderate
- **5** Slightly Moderate
- **4**
- **3**
- **2**
- **1**
- **0** Rest (sitting)



Aerobic Exercise

- Moving large muscle groups
- Performed in a rhythmic manner
- Exercise is performed for a sustained period
- Examples
 - Jogging
 - Biking
 - Dancing
 - Swimming

Aerobic Exercise



- Increases heart rate
- Strengthens heart and lungs
- Also referred to as “endurance exercise”



Aerobic Exercise

- **Intensity**

- Moderate intensity

- **Frequency**

- 2 hrs & 30 min / week
 - 30 min/day x 5 days
 - 25 min/day x 7 days
 - 30 min/day x 3 days

- In combination with another form of exercise on alternate days

- **Duration**

- Minimum of 10 min sessions

Aerobic Exercises



- Sports Related Exercises

- Jogging
- Dancing
- Swimming
- Water aerobics
- Aerobic exercise classes
- Biking
- Tennis
- Golf (without use of cart)

- Functional Activity Exercises

- Gardening
 - Raking
 - Mowing lawn
- Household Activity
 - Vacuuming
 - Mopping

Muscle Strengthening Exercise



- Strengthening large muscle groups
 - Legs, hips, back, chest, abdomen, shoulders & arms
- Require muscles to work harder than during normal daily activity
- Should be performed at moderate to high level of effort
- Strengthening exercises provided for rehabilitation count for weekly requirement

Muscle Strengthening Exercises



- **Intensity**
 - Moderate intensity
- **Frequency**
 - At least 2 day/week
- **Duration**
 - No required time
- **Repetitions**
 - One set of 8-12 repetitions is effective
 - Sets & repetitions should increase over time as muscles strengthen

Muscle Strengthening Exercises

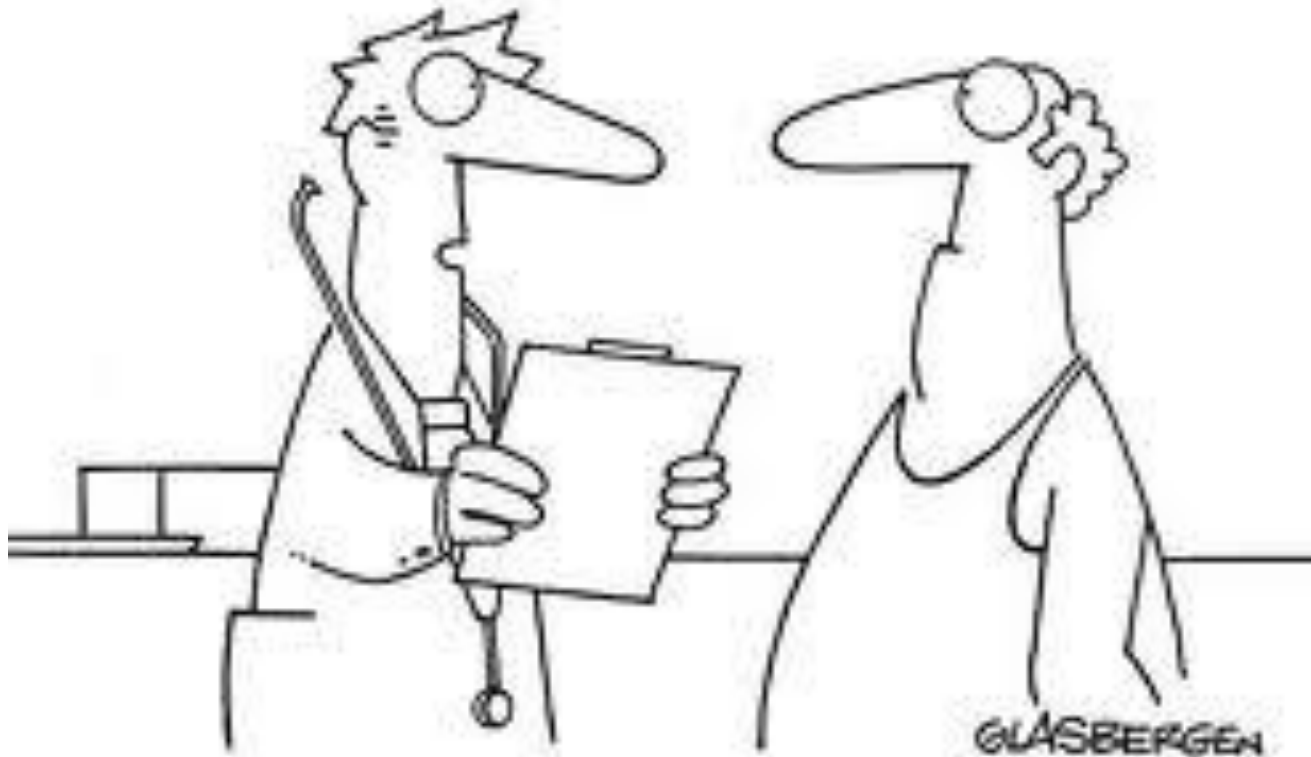
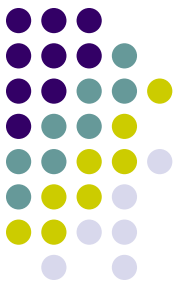


- Sports Related Exercise

- Using exercise equipment
 - Resistance bands
 - Weight machines
 - Hand-held weights
- Yoga Class
- Tai Chi Class

- Functional Activity Exercise

- Gardening
 - Digging
 - Lifting
 - Carrying
- Carrying groceries



"The handle on your recliner does not qualify as an exercise machine."

Fitness Categories



- Inactive Older Adult
 - Increase amount of physical activity gradually
 - Avoid vigorous activity initially
 - Begin with lower intensity exercise for shorter durations
 - Ex. Light walking for 10 min
 - **May need to consider health-care provider consult first**
- Active Older Adult
 - Consider increasing exercise intensity
 - Move from minimum 150 min/week up to 300 min/week
 - 60 min/day x 5 days



Fitness Categories

- Older Adults with Chronic Conditions
 - **Consult with health-care provider before starting an exercise program!**
 - Consider physical therapy referral for exercise prescription
 - Set exercise goals that meet ability level



Exercise Safety

- Exercise in safe environments
 - Well lighted & well maintained areas
 - Parks, mall & gyms
- Be weather conscience
 - Exercise during cool times of day
 - Change to indoor exercise during summer



Wrap-up

- **Habitual** physical activity promotes many health benefits
- Physical activity does not have to be strenuous to be beneficial
- **Chronic** exercise has been shown to boost immunity in older adults thus helping to prevent pneumonia

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Questions?

Exercise to live a **chronic**
healthy lifestyle!

