Normal Age Changes, Driving and Resilience

Fight for the Right!

Driving Medical Evaluation Practice

- Medical conditions that affect driving fall into three categories:
- **1. Conditions that engender functional limitations (chronic compromise);**
- **2. Conditions that involve an associated risk of compromise of consciousness (acute compromise); and**
- 3. Use of substances (alcohol, drugs, medications) judged to be incompatible with safe driving.

_____Happens with Age….but so can Resilience!

- Normal age changes occur ….along with multiple chronic illnesses.
- Maintaining driving over time is an option
- Resilience is the solution
  - Resilience refers to the capacity to spring back from a physical, emotional, financial, or social challenge.

Normal Changes in Vision

- Iris loses its ability to accommodate rapidly to light and dark and develops an increased need for light.
- Pupil becomes smaller and fixed.
- Lens becomes inflexible with less complete accommodation for near and far vision.
- Vitreous humor behind the lens may pull on the retina, producing holes or tears and predisposing the older person to retinal detachment.
- Ciliary muscle becomes stiff, which contributes to the problems of accommodating to distances.

Normal Changes in Vision

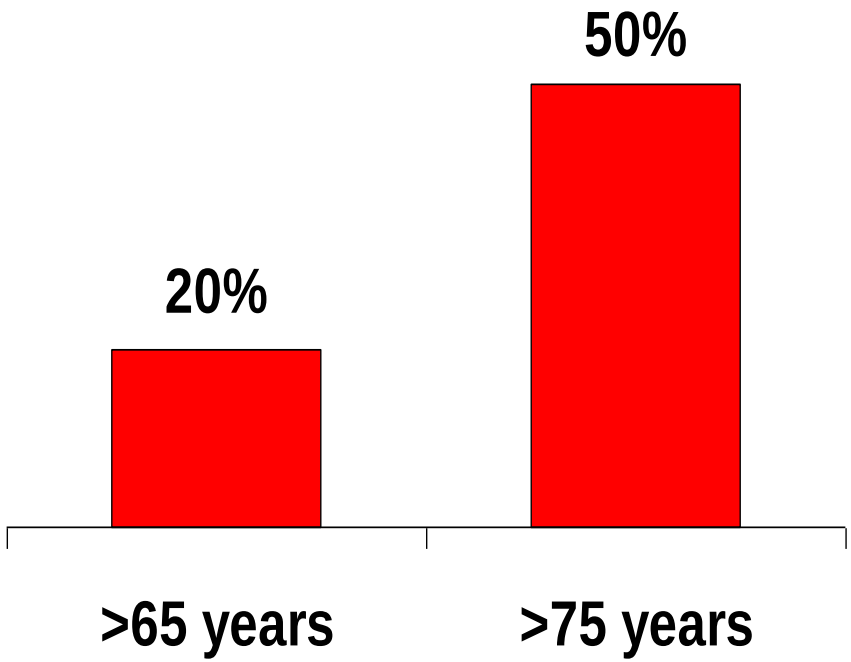
- By the age of 60 years, presbyopia may develop. Presbyopia is the inability to shift focus from far to near.
  - Caused by gradual hardening of the lens and decreased muscular effectiveness of the ciliary body

Normal Changes in Vision

- Dark-light adaptation slows as the pupillary response slows and rods degenerate.
- Lens yellows with increasing age, color discrimination becomes less acute, especially in the blue-green tones.
- Peripheral vision may decline because of decreased extraocular muscle strength,
- Depth perception may decline because of a thickening lens.
  - This may influence stepping into a car/truck/bus

CATARACT…Not Normal but Common

- Symptoms include ↑ glare, ↓ contrast sensitivity, ↓ visual acuity
- Risk factors: ↓ vitamin intake, light (ultraviolet B) exposure, smoking, alcohol use, long-term corticosteroid use, diabetes mellitus



Be Resilient: Fight for the Right

- Good lighting,
- Avoid glare,
- Encourage the world to use contrasting colors (e.g., black letters on white background) and large print for signs to facilitate vision.
- Allow time to adapt when moving between dark and light environments-when driving at night sit in the car for a bit to adjust to the dark.
- Wear glasses-get checked for visual changes

Normal Changes in Sensation

- Loss of tactile sensation as one ages-varies individually.
- Decreased kinesthetic sense, which is the person's awareness of his or her body in space.
  - Decreased kinesthetic sense results in postural instability and difficulty reacting to bodily changes in space.

Normal Sensory Changes in Sensation and Kinesthetic Sense

- Increased difficulty performing fine motor activities such as buttoning clothes or picking up objects.
- Decreased balance.

Be Resilient: Fight for the Right

- Awareness…..make sure you have a good grab on the steering wheel
- Exercise to optimize balance and tolerance of position changes.

Normal Changes in Musculoskeletal SX

- Decreased range of motion: ??? disuse versus normal?
- Arthritis affects about 60 million individuals.
  - Causes pain, stiffness, and tenderness around the joints and typically affects the hands, feet, knees & hips.
  - Can causes significant disability.

Normal Changes in Musculoskeletal Sx

- Reduction in the number and size of muscle fibers→less muscle tension and decreased strength of the contraction.
- Decrease lean muscle mass and the loss of elasticity contribute to lost flexibility and increased stiffness.
- Sarcopenia

Resilience: Fight for the Right

- Increase protein intake
- Increase physical activity
  - Aerobic
  - Resistive as loading of muscle with weight-lifting exercise reverses loss of muscle mass
  - Stretching and range of motion
- Optimize range of motion
  - http://www.livestrong.com/article/123625-activities-increase-range-motion-elderly/

Normal Changes in Memory

- Changes in working memory and executive abilities
- Decline in perceptual motor skills, concept formation, complex memory tasks, and quick-decision tasks.
- Older adults may take longer to respond to and assimilate new material.

Resilience: Fight for the Right

- Use it / challenge it
- EXERCISE
  - Not definitive that it helps cognition…but increases blood flow and can't hurt!

Normal Changes in Hearing

- With age there are multiple changes
  - (auricle becomes elongated and broader, the cartilage is less elastic and less flexible, and tophi may appear on the pinna, hairs on the external ear canal become longer and coarser, the tympanic membrane is thicker and more fixed, and there are fewer cerumen glands, hair cells, neuron-supporting cells, ganglion cells, and fibers are decreased)
- → causes decreased hearing and balance.

Normal Changes in Hearing

- Hearing is affected in two critical ways:
  - reduction in threshold sensitivity and
  - reduction in the ability to understand speech.

Source	Intensity Level
Threshold of Hearing (TOH)	0 dB
Rustling Leaves	10 dB
Whisper	20 dB
Normal Conversation	**60 dB**
Busy Street Traffic	70 dB
Vacuum Cleaner	80 dB
Large Orchestra	98 dB
Walkman at Maximum Level/Police Siren	**100 dB**
Front Rows of Rock Concert	110 dB
Threshold of Painful Sound	130 dB
Military Jet Takeoff	140 dB
Instant Perforation of Eardrum	160 dB

Normal Changes in Hearing

- **Sensorineural hearing loss** is due to degeneration or changes in the neural receptors in the cochlea, cranial nerve VIII (the acoustic nerve), and central nervous system.
  - **Presbycusis is defined as a sensorineural hearing loss – most common form of hearing loss in older adults.**
    - gradual, progressive, bilateral, symmetrical, high-frequency sensorineural (perceptive) hearing loss with poor speech discrimination.
- **Conductive hearing loss** is due to the blockage of sound transmission from the external ear through the tympanic membrane and small bones in the middle ear. Often have both!

Normal Changes in Hearing

- Commonly there is a loss of discrimination ability.
  - Difficulty hearing high-frequency, stimuli-sibilant sounds (-f-, -s-, -th-, -ch-, and -sh-).
  - **Noisy environments further hamper the ability to hear certain sounds.**

Be Resilient and Fight for the Right

- Eliminate background noise,
  - Encourage older adults to go radio free
  - Talk less if there are passengers in the car
  - Assure that the car industry makes horns/sirens that older adults can hear

Be Resilient: Fight for the Right

- Alter the environment and behavior to optimize hearing and seeing
- Engage in activities that stimulate the mind

- Optimize function, physical activity & ROM
  - Daily physical activity
  - Park further and walk more
  - Stretch and range and strengthen