The Aging Body and Brain

- I have no financial relationships to disclose.

- “Mind and body are not independent....for there are not two processes, and there are not two entities; there is but one process. One entity....an inextricable mixture and unity of both...they are one.”
- Spinoza, 17th century philosopher

- In view of this unity of mind, body, and brain it is important in the care of seniors with mental health difficulties to take into account all the physiologic systems.
- This presentation reviews a broad list of the physiologic systems, changes we see with aging, and the potential impact on the central nervous system and mental health.

Skin

- Increased wrinkling and age spots: Loss of self esteem
- Decreased vitamin D production: Cognitive decline
- Decreased sebum production: Pruritus
- Increased bruising: Suspiscion of elder abuse

Vision

- Impaired vision: Charles Bonnet syndrome, cognitive decline, social isolation, decreased overall quality of life

Auditory

- Hearing loss: Social isolation, confusion, depression, irritability,delusional disorder paranoia

Pulmonary

- Propensity to hypoxia and sleep apnea: Confusion, anxiety, confusion, fatigue, increased risk for infection and delirium

Cardiovascular

- Hypertension: Strokes, vascular dementia, depression, side effects from meds used to treat

Gastrointestinal

- Decreased smell and taste: Anorexia, decreased quality of life
- Decreased fundal compliance: Anorexia
- Decreased gastric emptying: Anorexia
- Food associated hypotension: Syncope
- Prolonged colonic transit time: Constipation
- Altered liver drug metabolism: Altered psychiatric drug clearance

Kidney

- Decreased renal filtration rate: Altered drug clearance
- Altered water metablolism: Dehydration, electrolyte imbalance, delirium

Skeletal System

- Osteoporosis: Pain, altered body image, depression, fractures, delirum
- Osteoarthritis: Pain, functional decline
- Loss of muscle function: Sarcopenia, frailty, functional loss,

Immune system

- Increased interleukin - 6: Increased risk for delerium and possibly Alzheimer's disease
- Decreased T cells and macrophage function: Increased infection

Endocrine system

- Decreased testosterone: Decreased libido, dysphoria, possibly decreased cognition
- Increased insulin: AD risk
- Abnormal glucose metabolism: Delerium
- Increased cortisol: Depression, hippocampal shrinkage
- Increased vasopressin: Hyponatremia

Brain

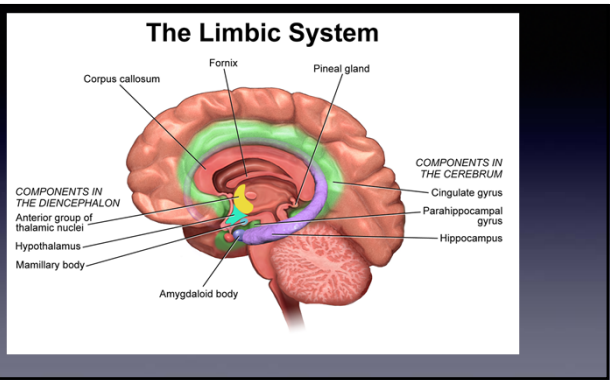
- White matter volume loss: Cognitive decline
- Grey matter volume loss: Cognitive decline
- Hippocampal volume loss: Memory difficulties
- Loss of myelin: Slowed mental and sensory processing
- Loss of frontal lobe volume: Decreased executive functioning
- Decreased dendiritic arbor: Cognitive decline

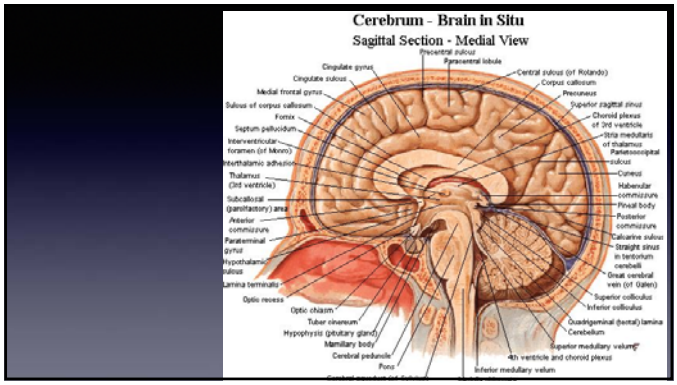
Brain

- Decreased fluidity of movement: Falling
- Decreased motor reaction time: Falling
- Decreased speed of walking: Risk of misdiagnosis of Parkinson's
- Decrease in cerebral blood flow: risk of stroke, impaired cognition, impaired motor and sensory function
- Decline in acetylcholine neurotransmission: cognitive decline, increased risk for delerium

Brain

- Decline in neuroplasticity and neurogenesis: slowed recovery from strokes, head injury, and other brain insults
- Increased neural network complexity: Improved emotional resilience




Cerebrum - Brain in Situ
Sagittal Section - Medial View
Precentral sulcus
Paracentral lobule
Cingulate gyrus
Cingulate sulcus
Central sulcus (of Rolando)
Corpus callosum
Medial frontal gyrus
Precuneus
Sulcus of corpus callosum
Superior sagittal sinus
Fornix
Choroid plexus of 3rd ventricle
Septum pellucidum
Stria medullaris of thalamus
Interventricular foramen (of Monro)
Parietooccipital sulcus
Interthalamic adhesion
Cuneus
Thalamus (3rd ventricle)
Habenular commissure
Subcallosal (paraterminal) area
Pineal body
Anterior commissure
Posterior commissure
Paraterminal gyrus
Calcarine sulcus
Straight sinus in tentorium cerebelli
Hypothalamic sulcus
Great cerebral vein (of Galen)
Lamina terminalis
Superior colliculus
Optic recess
Inferior colliculus
Optic chiasm
Tuber cinereum
Quadrigeminal (tectal) lamina
Hypophysis (pituitary gland)
Cerebellum
Mamillary body
Superior medullary velum
Cerebral peduncle
4th ventricle and choroid plexus
Pons
Inferior medullary velum