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

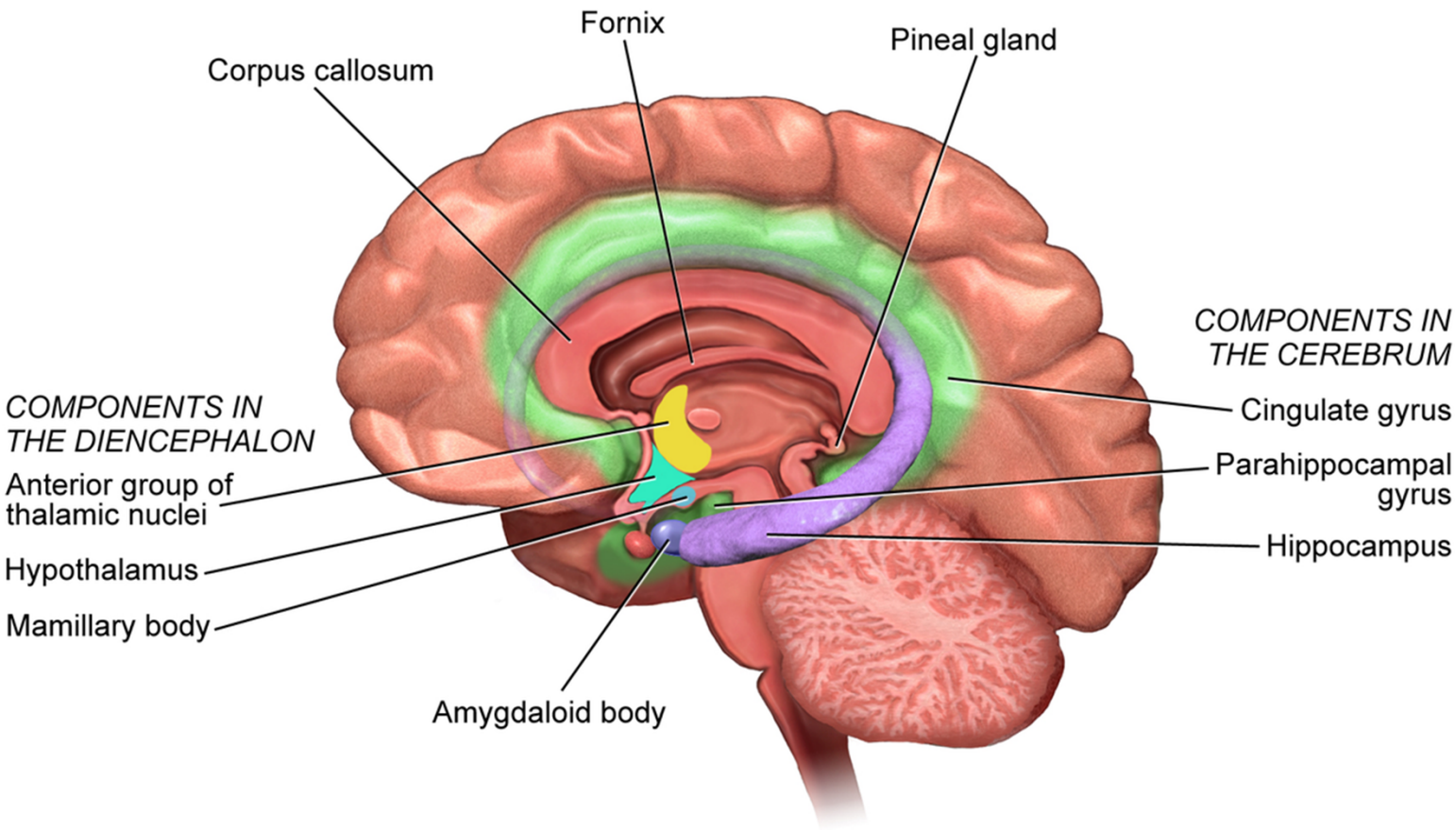
Brain

- 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

The Limbic System



Cerebrum - Brain in Situ

Sagittal Section - Medial View