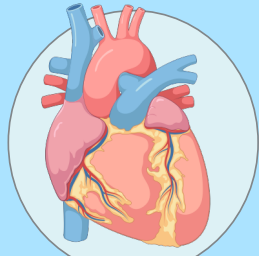


# CHANGES SEEN IN THE GERIATRIC POPULATION

## QUICK REFERENCE PG-ELITE-NCE PREP.COM

In the geriatric population we see decreases in reserve and function in all major body systems as well as a decreased ability to respond to acute stress. Increasing age correlates with increased perioperative risk as well as increased risk of morbidity and mortality. Understanding physiological changes in the aging population can increase patient safety and improve outcomes.



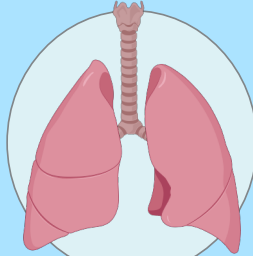
### CARDIAC

#### INCREASED

- LV wall thickness
- LV wall tension
- Diastolic dysfunction
- Atrial size
- SVR/ PVR
- Systolic blood pressure
- LV workload
- Circulation time
- Vagal tone
- Rhythm disturbances

#### DECREASED

- LV compliance
- Beta response
- Inotropic response
- Adrenergic response
- Baroreceptor response
- Pacemaker capture
- Cardiac reserve
- Cardiac output
- SV
- Coronary artery blood flow
- HR at rest



### RESPIRATORY

#### INCREASED

- Chest wall stiffness
- Lung compliance
- Aspiration risk
- Physiologic dead space
- Respiratory workload
- Risk for hypoxia
- Closing capacity
- Sensitivity to opioids (Resp depression)
- Alveolar compliance
- Airway reactivity
- Potential for obstruction

#### DECREASED

- Response to low O<sub>2</sub>/high CO<sub>2</sub>
- Cough reflex
- Tissue elasticity
- Chest wall compliance
- Alveolar surface area
- Compensation for heavy demand
- Vital capacity
- Inspiratory/Expiratory RV
- Mobility of cervical spine



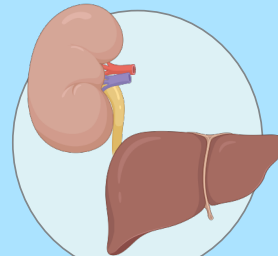
### NEURO/NERVOUS

#### INCREASED

- Risk of perioperative neurocognitive disorder
- Neuron loss (cerebral cortex)
- Peripheral nerve cell degeneration
- Cerebrospinal fluid
- Hearing/visual threshold
- Temp/ touch threshold
- Spinal anesthesia duration
- Memory loss

#### DECREASED

- Amount of neurotransmitters
- Cognitive function
- Blood flow (cerebral)
- Brain mass
- Intercranial volume
- Speed of nerve conduction
- Skeletal muscle mass
- Skeletal muscle strength/control
- Dosage for general anesthetics
- Hypothalamic temperature regulation



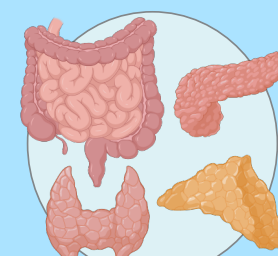
### RENAL / HEPATIC

#### INCREASED

- Blood urea nitrogen (BUN)
- Risk for hyper/hypokalemia
- Secretion of ADH in response to osmolar stimuli
- Loss of liver mass

#### DECREASED

- GFR
- Renal perfusion
- Renal mass
- Fluid/sodium handling
- Ability to concentrate urine
- Response to ADH
- Response to aldosterone
- Ability to excrete drugs
- Liver mass
- Hepatic perfusion
- Hepatic function
- Hepatic metabolism
- Production of albumin
- Biotransformation
- Plasma cholinesterase levels



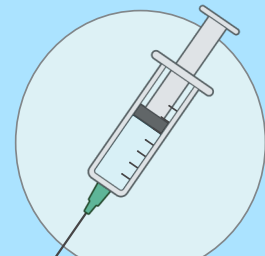
### GI / ENDOCRINE

#### INCREASED

- Gastric pH
- Gastric emptying time
- Constipation
- Insulin resistance
- Risk of DM type II
- TSH levels
- Risk of hypothyroidism

#### DECREASED

- Esophageal motility
- Motility of stomach/intestines
- Estrogen production
- Testosterone production
- Progesterone production
- Growth hormone
- Serum aldosterone
- Cortisol secretion
- Insulin release



### PHARMACOLOGY

#### INCREASED

- Initial plasma concentration of drugs
- Free drug availability
- Inhalational agent uptake
- Drug circulation time
- Volume of distribution (lipid soluble drugs)
- Emergence / recovery time from volatile anesthetics
- Action (time) of drugs metabolized/ excreted by the liver or kidneys
- Action (time) of lipid soluble drugs

**Note:** Response to paralytic agents is unchanged with age

#### DECREASED

- Protein binding
- Dosage for opiates
- Dosage for barbiturates
- Dosage for benzodiazepines
- MAC of volatile anesthetic
- Volume of distribution (water soluble drugs)