

Geriatric Anesthesia

Anesthetic Pearls: Anesthesia Requirements for the Geriatric Patient

Cardiovascular:

1. Decreased ability to increase heart rate in response to hypovolemia, hypotension, and hypoxia.
2. Decreased arterial oxygen tension.
3. Decreased arterial elasticity / compliance which predisposes to increased afterload & LVH.
4. Decreased cardiac reserve leads to exaggerated drop in BP on induction.

Respiratory:

1. Decreased lung compliance.
2. Increased propensity for atelectasis & V/Q mismatch.
3. Impaired cough reflex.
4. Decreased protective laryngeal reflexes and increased risk for aspiration.

Renal:

1. Decreased renal tubular function (concentrating ability, sodium handling, diluting capacity, drug excretion) therefore greater risk for dehydration & fluid overload.
2. Decreased renal blood flow & GFR.

GI:

1. Decreased hepatic blood flow and therefore decreased first pass extraction.
2. Decreased albumin leading to greater amounts of free drug that is normally protein bound.
3. Decreased plasma cholinesterase, biotransformation, and oxidative metabolism phase-I (Propranolol & Midazolam)

CNS:

1. Decreased synthesis of neurotransmitters.
2. Decreased dosage requirements for local anesthetics and inhalational anesthetics (MAC).
3. Increased cephalad spread of a given volume of epidural anesthetic but a shorter duration.
4. Increased duration of spinal anesthetic.

Pharmacodynamics:

Decreased absolute number of receptors (receptor sensitivity variably increased / decreased).

Pharmacokinetics:

1. Decreased oral absorption, change in distribution, decreased muscle mass, increased adipose tissue, increased bioavailability, decreased albumin, altered protein binding, decreased clearance, decreased hepatic blood flow, decreased oxidative metabolism, decreased renal clearance.
2. Decreased total body water and therefore an increased plasma concentration of water soluble drugs.
3. Increased fat and therefore decreased plasma concentration of lipid soluble drugs but longer half-life elimination.

Inhalational:

MAC is decreased 4% per decade over age 40.

Many authors suggest that MAC for an 80 y/o is decreased ~ 25%.)

Non-Volatile agents:

- A. Slower redistribution (consider using half the dose of propofol & STP)
- B. Opioids: along with the smaller initial volume of distribution (higher serum levels of Fentanyl, MS, and Demerol) there is a longer half-life and increased brain sensitivity. Initial dosing decreased by approximately 25-50%.
- C. Midazolam: fat soluble at physiologic pH; has a longer half-life.
- D. Muscle Relaxants: Delayed onset secondary to decreased CO and reduced blood flow to muscle. Also slower relaxant recovery from decreased hepatic & renal function.