ELDERLY MEDICINE

AGE RELATED CHANGES

CARDIOVASCULAR

- myocardial fibrosis
- ventricular wall stiffening (diastolic dysfunction)
- increased SVR -> systolic hypertension -> LVH + conductance disturbances
- widened pulse pressure
- autonomic responsiveness declines -> increased risk of hypotension
- capillary permeability increased

CENTRAL NERVOUS SYSTEM

- brain size and neuronal mass/density decreases
- decrease in noradrenaline and dopamine synthesis
- decline in slow wave sleep (patient sleep more but have difficulty falling asleep)
- progressive decrease in sympathetic and parasympathetic responsiveness
- pain threshold may be increased
- Postoperative Cognitive Dysfunction (POCD) is common
- thirst response reduced -> susceptible to fluid depletion

RESPIRATORY

- Progressive loss of function and increased risk of aspiration
- Decreased sensitivity of respiratory center -> ventilatory response to hypercapnia and hypoxia declines (increased risk of respiratory failure)
- loss of alveolar gas exchange surface
- Decreased O2 consumption
- Decreased CO2 production
- increased pulmonary compliance from loss of elastic recoil, loss of chest wall compliance from joint disease (total compliance decreased)
- decreased FVC and FEV1
- closing volume increases to exceed FRC in the upright posture @ ~66y -> increase in venous admixture
- normal PaO2 = (100-age/4)mmHg (increasing A-a gradient with age)
- decreased responsiveness of airway protective reflexes -> increased risk of aspiration

RENAL

- renal mass and glomeruli fall progressively -> reduced GFR
- deterioration in tubular function, renin-AG-ALD responsive, ADH sensitivity and concentrating ability -> susceptibility to hypovolaemia, overload and electrolyte abnormalities
- decreased renal clearance of drugs

HEPATIC

- cellular function well preserved
- blood flow falls over time
- decreased hepatic clearance of drugs

THERMOREGULATION

- impaired thermoregulation -> increased risk of hypothermia
- ability to shiver decreased (decreased muscle mass)
- shivering and vasoconstriction dramatically increases myocardial work and O2 demand

NUTRITION

- frequently poor
- risk of overfeeding in ICU

HAEMATOLOGY/IMMUNE SYSTEM

- hypercoagulability and DVT increased with age and comorbidity
- marrow response to anaemia impaired
- immune responses are impaired (reduced bone marrow, thymus and splenic mass)

PHARMACODYNAMICS AND PHARMACOKINETICS

- duration of action of drugs may be prolonged as Vd reduced, reduced hepatic and renal clearance
- increased sensitivity to CNS depressants
- prone to polypharmacy and increased drug interactions as a result
- drug errors due to cognitive decline (overdose or non-compliance) and involvement of multiple doctors