

# NRSG259 Revision

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## AGEING

### *THEORIES:*

#### Wear & Tear Theory

- Repetitive use of different body structures over time
- Human body is like a machine – the longevity of the body is affected by the care it receives and its genetic components
- Harmful and stressful factors can exacerbate this
  - smoking
  - poor diet
  - alcohol abuse
  - muscular strain
- Example – osteoarthritis

#### Cross-Linking Theory

- Ageing results from the accumulation of intra- and intermolecular covalent bonds between molecules
- Cross links are associated with:
  - the loss of elasticity in the skin and muscle tissue
  - stiffening of blood vessel walls
  - changes in the lens of the eye
  - delayed wound healing
  - reduced joint mobility in ageing individuals

#### Free Radical Theory

- Atoms or molecules with single unpaired electrons
- Rapidly interact with and damage cellular components such as lipids, proteins and nucleic acids
- Exposure to both natural and synthetic environmental pollutants:
  - heavy metal
  - pesticides
  - tobacco smoke
  - radiation

#### Role Theory

- Engagement in roles change over time, some biologically driven and some transcend time
- Ability to adapt to roles, conflict in valuing of roles predict adjustment to personal ageing
- Influenced by age norms

#### Continuity Theory

- Why adults employ their past concepts, constructs and experiences to adapt and adjust to the changes brought about by normal ageing

- Diminished ciliary and macrophage activity, drier mucus membranes  
→ decreased cough and airway action results in mucus matter clearance reduced causing an increased risk of infection and bronchospasm with airway obstruction
- Decreased cough reflex  
→ increased risk of aspiration

### COPD

- Preventable and treatable disease with extra pulmonary effects that may contribute to the severity in patients
- Characterised by airflow limitation that is not reversible
- Airflow limitation is progressive and associated with abnormal inflammatory response of the lung

### Cardiovascular Changes

- Maximum pumping rate declines
- Capacity of oxygen binding to RBC diminishes
- Some tissues calcify and stiffen
- Stiffening of the aorta and arteries – hypertension or hypotension

### Age-Associated Cardiovascular Changes

- Arterial wall thickening and stiffening  
→ decreased exercise tolerance resulting in fatigue and SOB
- Left ventricular and atrial hypertrophy  
→ risk of arrhythmias
- Sclerosis of atrial and mitral valves  
→ diminished peripheral pulses and cold extremities
- Reduced arterial compliance and beta-adrenergic response  
→ increased blood pressure
- Reduced baroreceptor sensitivity and SA node automaticity  
→ postural hypotension

### Age-Associated Changes in Musculoskeletal System

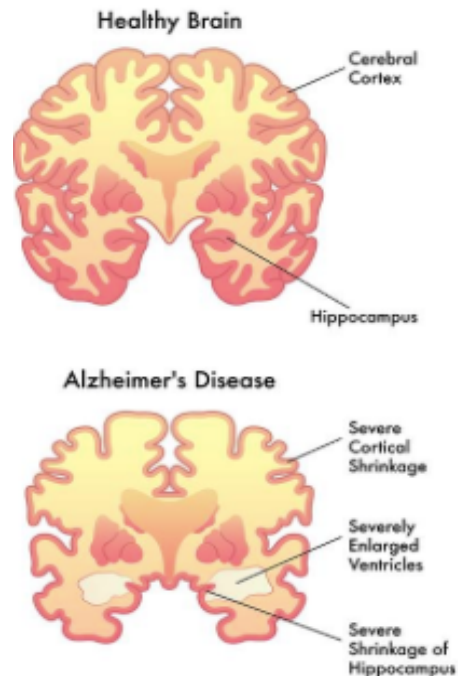
- Decreased muscle mass  
→ increased risk of disability and falls
- Decreased muscle activity  
→ risk of osteoporosis
- Deterioration and drying of joint cartilage  
→ limited range of motion, joint instability and risk of osteoarthritis
- Decreased bone mass and osteoblastic activity  
→ muscle weakness and muscle fatigue

### Gastrointestinal Changes

- Decreased taste sensation
- Decreased saliva production
- Decreased hydrochloric acid
- Increased risk of aspiration, indigestion and constipation
- Decreased oesophageal, gastric and intestinal motility

## Alzheimer's Disease

- Insidious onset
- Memory decline is cardinal feature
- Decline in at least one other area of cognition
- Progressive and irreversible
- Memory loss is one of the earliest symptoms
- Decreased cognitive functions
- Changes in personality or behavior
- Age is a big risk factor
- Risk Factors:
  - diabetes
  - midlife hypertension
  - smoking
  - AF
  - stroke
  - cholesterol
- In the brain:
  - the cortex shrivels up, damaging areas involved in thinking, planning and remembering
  - shrinkage is especially severe in the hippocampus, an area of the cortex that plays a key role in formation of new memories
  - ventricles grow large
- Inter-related factors
  - genetics
  - environmental influences – previous head trauma, educational level
  - lifestyle factors – dietary habits
  - high blood pressure
  - high cholesterol
  - develops as a result of complex cascade of biological processes that take place over many years inside the brain
- Symptoms:
  - Difficulty performing otherwise familiar tasks – preparing a meal
  - Memory loss that affects job skills – unable to concentrate
  - Problems using language – less fluent and may have problems writing coherently
  - Disorientation to time and place – lose track of time, become lost
  - Loss of good judgment – wearing pyjamas outside, giving away large amounts of money
  - Problems with abstract thinking – meaning of numbers
  - Misplacing things – putting things in usual places



- UV radiation – sunscreen
- Menopausal hormone therapy
- Infection: Hep B, Hep C, HPV, helicobacter pylori
- Hormones: menopausal hormone therapy, oral contraceptives
- Reproductive factors: insufficient breast feeding
- Aspirin

### Liver Anatomy

- 1.5kg
- Largest visceral organ
- Lobes – left and right, caudate and quadrate
- Hilus – where all vessel converge
- Falciform ligament – part of this is remnant of fetal bypass
- Lobes divided into lobules
- Between lobules: connective tissue membrane containing blood vessels, bile canaliculi, lymph vessels
- No nerves penetrate liver (except in blood vessels) so pain associated with liver swelling is due to stretch of peritoneum and pressure on other organs

### Liver Capillaries

- Sinusoids: very permeable capillaries with no basement membrane
- Kupffer Cells line the sinusoids and act as macrophages for iron storage and recycling
- They also have an important role in filtering the build of endotoxins produced by the gut microflora

### Functions of the Liver

- Role in drug activation, deactivation, transport
- Role in digestion
- Role in metabolism of all nutrients
- Role in protection against pathogens and toxins
- Role in storage
- Produce plasma proteins

### Cancer Terminology

- Neoplasm – formation of a tumour
- Carcinoma – from epithelial tissue
- Sarcoma – malignant tumours from connective tissue
- Lymphoma – from lymphatic tissue
- Leukaemia – from leukocytes

### Hepatocellular Neoplasms

- Benign – Malignant
- Hepatoblastoma → children, fetal alcohol syndrome increases risk
- Angiosarcoma → increased risk with exposure to poly-vinyl-chlorides generally rare and in individuals over the age of 70