

Gastrointestinal Aging Changes:

- ❖ Poor dentition
- ❖ ↓ number of taste buds
- ❖ ↓ muscle strength for chewing
- ❖ ↓ saliva production
- ❖ ↓ ptyalin in saliva
- ❖ Weakened gag reflex
- ❖ ↓ gastric acid secretion
- ❖ ↓ emptying of esophagus and stomach
- ❖ ↓ intrinsic factor
- ❖ Thickened bile
- ❖ Thinned gastric mucosa
- ❖ ↓ ability of small intestine to absorb sugars and lipids
- ❖ ↓ hepatic enzymes and storage capacity

Consequences

- ❖ ↓ taste sensation
- ❖ ↓ appetite
- ❖ ↓ chewing ability
- ❖ ↓ digestion of starch
- ❖ Possible swallowing difficulty
- ❖ Indigestion, flatus
- ❖ Risk of pernicious anemia
- ❖ ↑ problems with elimination
- ❖ ↓ tolerance for fats
- ❖ Possible change in drug metabolism
- ❖ Difficulty in gaining weight

Musculoskeletal Aging Changes

- ❖ Muscle cells atrophy
- ❖ Generalized symmetrical muscle wasting
- ❖ Demineralization of bones
- ❖ Deterioration of cartilage surface of joints
- ❖ Thinning of intervertebral discs
- ❖ Loss of cartilage in vertebral column
- ❖ Loss of elastic fibers in muscle tissue
- ❖ Kyphosis

Consequences:

- ❖ ↓ muscle strength after age 70
- ❖ Two-inch loss of height between ages 20 and 70
- ❖ ↑ incidence of osteoporosis
- ❖ ↓ joint range of motion
- ❖ ↓ flexibility
- ❖ ↓ mobility
- ❖ ↑ risk of falls
- ❖ Gait changes
- ❖ Changes in body image

Genitourinary Aging Changes

- ❖ ↓ number of nephrons
- ❖ ↓ glomerular filtration rate and tubular reabsorption
- ❖ Change in renal threshold
- ❖ ↓ blood flow to kidneys
- ❖ ↓ bladder capacity from 500 ml to 250 ml
- ❖ ↓ elasticity of bladder
- ❖ ↓ bladder tone
- ❖ ↓ muscle tone of urethra
- ❖ Benign prostatic hyperplasia common in males

Consequences:

- ❖ ↓ creatinine clearance
- ❖ ↓ ability to concentrate urine
- ❖ ↑ risk of urinary retention
- ❖ ↑ incidence of incontinence
- ❖ ↑ urinary frequency; nocturia
- ❖ Effects on drug clearance via kidneys

Sources: Brown, Jeri B., Bedford, Nancy K., White, Sarah J. (1999) *Gerontological Protocol for Nurse Practitioners*. Lippincott Williams & Wilkins, Inc.; American Assn. for Geriatric Psychiatry. (2005). *Comprehensive Textbook of Geriatric Psychiatry*, 3rd Ed. W.W. Norton & Co.

VIHA, Delirium 2006. <http://www.viha.ca/ppo/learning/delirium/> Age Related Changes Handout/V2 - 2007

Hearing Aging Changes

- ❖ ↓ number of nerve cells in 8th cranial nerve
- ❖ ↑ production of cerumen
- ❖ ↑ amount of keratin in cerumen
- ❖ Atrophy of rigidity of ossicles
- ❖ ↓ elasticity of tympanic membrane

Consequences

- ❖ Presbycusis (hearing loss due to age-related changes in the inner ear)
- ❖ High frequency loss occurs first
- ❖ Tone discrimination loss
- ❖ Difficult following conversations
- ❖ Cerumen impaction
- ❖ Social isolation

Age-Related Changes



Integumentary Aging Changes:

- ❖ Thinning and atrophy of epidermis
- ❖ ↓ strength and elasticity of epidermis
- ❖ ↓ blood flow
- ❖ ↑ vascular fragility
- ❖ Loss of subcutaneous fat
- ❖ ↓ size and function of sweat glands
- ❖ ↓ sebaceous secretions
- ❖ "Clustering" of melanocytes
- ❖ ↓ number of nerve cells
- ❖ Thinning and graying of scalp, pubic, and axilla hair
- ❖ Thickening of nasal and ear hair
- ❖ ↑ facial hair in women
- ❖ ↓ blood supply to nailbed
- ❖ ↑ longitudinal striations in nails
- ❖ Accumulation of "debris" under nails

Consequences:

- ❖ ↑ susceptibility to infection, trauma, malignant lesions, pressure ulcers
- ❖ Skin is dry, scaly, wrinkled
- ❖ ↓ skin turgor
- ❖ ↓ ability to maintain body temperature and homeostasis; baseline temperature may be lower than normal
- ❖ Slower rate of healing
- ❖ Slower absorption of drugs by subcutaneous route
- ❖ "Liver Spots"
- ❖ Nails thicken, grow slowly, become brittle and yellowed
- ❖ ↑ risk of splitting, infections of the nails

Visual Aging Changes :

- ❖ Yellowing, opacity, rigidity of the lens
- ❖ ↓ pupil size
- ❖ ↓ accommodation
- ❖ Less efficient absorption of intraocular fluid
- ❖ Narrowing of visual field
- ❖ ↓ lacrimal secretions
- ❖ ↓ number of cones in retina

Consequences

- ❖ Presbyopia -inability to focus properly
- ❖ Distorted depth perception
- ❖ ↓ colour discrimination
- ❖ Need for Stronger light
- ❖ Increased sensitivity to glare
- ❖ Drier cornea

Respiratory Aging Changes:

- ❖ ↓ elasticity of lungs
- ❖ ↓ number of alveoli
- ❖ ↑ size of alveoli
- ❖ ↑ diameter of alveolar ducts and bronchioles
- ❖ ↓ ciliary action
- ❖ ↑ anteroposterior chest diameter
- ❖ Weakening of respiratory muscles
- ❖ ↓ coughing reflex
- ❖ Calcification of costal cartilages

Consequences

- ❖ 50% increased residual capacity
- ❖ ↓ vital capacity
- ❖ ↓ mobility of bony thorax
- ❖ ↓ arterial blood oxygen level
- ❖ ↓ oxygen uptake during exercise
- ❖ ↑ risk of infection
- ❖ ↑ amount of dead air space
- ❖ ↓ exercise tolerance
- ❖ ↓ gas exchange

Neurological Aging Changes:

- ❖ ↓ number of neurons
- ❖ ↓ weight of brain
- ❖ Histological changes in brain; ↑ intracellular pigment, ↓ protein synthesis, senile plaques
- ❖ ↓ rate of conduction in peripheral nerves
- ❖ Change in sleep patterns
- ❖ Depletion of dopamine and some of the enzymes in the brain
- ❖ ↑ accumulation of lipofuscin
- ❖ query diminished brain cholinergic reserve

Consequences:

- ❖ ↓ Adaptability
- ❖ Slower response to stimuli
- ❖ ↓ Sensation
- ❖ Impaired proprioception
- ❖ Gait changes
- ❖ ↓ deep tendon reflexes
- ❖ Slower voluntary movement
- ❖ Sleep pattern disturbances
- ❖ ↑ Susceptibility to environmental temperature changes
- ❖ ↓ short-term memory