GERONTOLOGIC NURSING

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* definition
* **Gerontologic/geriatric nursing:** the field of nursing that specializes in the nursing process as it relates to the assessment, nursing diagnosis, planning, implementation, and evaluation of older adults in all environments including acute, intermediate, and skilled care as well as within the community.

* **Aging** is a **multidisciplinary** field. It is the process of gradual and spontaneous change resulting in maturation. It has three categories;
  + Senescence – the condition of aging often marked by a decrease in physical and mental abilities.
  + Normal aging- common complex diseases and impairments that affect many older people
  + Successful (healthy) aging- a process by which aging is not accompanied by debilitating disease or disability.
* **Gerontology** is the study of the aging processes and individuals as they grow from middle age through later life. It includes:
* the study of physical, mental, and social changes in older people as they age
* the investigation of the changes in society resulting from our aging population
* the application of this knowledge to policies and programs. As a result of the multidisciplinary focus of gerontology, professionals from diverse fields call themselves **"gerontologists"**
* **Geriatrics** is:

- the study of health and disease in later life

- the comprehensive health care of older persons and the well-being of their informal caregiver .

* distinct processes of aging
* Chronological aging is the definition of aging based on a person's years lived from birth.
* Biological aging refers to the physical changes that reduce the efficiency of organ systems.
* Psychological aging includes the changes that occur in sensory and perceptual processes, cognitive abilities, adaptive capacity, and personality.
* Social aging refers to an individual's changing roles and relationships with family, friends, and other informal supports, productive roles within the organization.

PRINCIPLES OF GERIATRICS

* The core values of geriatric nursing include:
* Health promotion
* Health protection
* Disease prevention
* Treatment of disease

THEORIES OF AGING

* Multiple processes affect how humans age. Some changes may be superficial while others may increase the risks of diseases and disability.
* i) biological aging theories.
* ii) sociological aging theories.
* Biological aging theories
* Divided into programmed and error theories.
* A) programmed theories- biological timetable
* i) programmed longevity- aging is the result of sequential switching on and off of certain genes. Also known as genetic theory.
* ii) endocrine- biological clocks act through hormones to control the pace of aging by use of natural and synthetic hormones
* Cont…….
* iii) immunology- a programmed decline in the immune system function leads to an increased vulnerability to infections
* B)Error theories- environmental assault
* i) wear and tear- cells and organs have vital parts than wear after years of use: liver
* ii) cross-link theory- glucose and proteins bind causing problems: cataracts
* Sociological aging theories
* Focus on roles and r/ships in life
* i)disengagement-Gradual withdrawal from society and relationships preserves social equilibrium and promotes self-reflection for elders who are freed from societal roles.
* ii) Activity theory-In order for older adults to maintain morale in old age, substitutions must be made for lost roles.
* Cont……..
* iii) continuing- successful aging involves maintaining previous habits that have formed the basic underlying structure of adult life.
* iv) age stratification theory-older adults born during different time periods form cohorts that define "age strata". There are two differences among strata: Chronological age and Historical experience

Pharmacology and Elders

* Chronic conditions may alter
  + Pharmacokinetics (what the body does to the drug)
  + Pharmacodynamics (what the drug does to the body)
* Physiological responses to medications may also depend on the race or ethnic background of the older person
* Changes with Aging
* Decrease in body water (as much as 15%) and an increase in body fat
  + Increased concentration of water-soluble drugs (e.g. alcohol)
  + More prolonged effects of fat-soluble drugs
* Decreased hepatic blood flow
  + Results in increased toxicity when older persons take usual doses of "first-pass effect" drugs because a smaller portion of these drug concentrations would be detoxified immediately by the liver
* Decreases in serum albumin levels
  + Lead to altered binding capacity
  + May cause increased serum levels of the "free" or unbound proportion of protein-bound drugs
  + May result in toxic levels of highly bound drugs because more unbound drug is available to produce its effects
* The kidneys excrete most drugs
  + Individuals vary in degree of decline of renal function
* Normal aging process
* Normal aging consists of those universal changes that occur in all older people
* Intrinsic aging (from within the person) refers to those changes caused by the normal aging

process that are genetically programmed and essentially universal within a species.

* Extrinsic aging results from influences outside the person e.g. environment.
* Homeostasis – the tendency of the body toward maintaining equilibrium i.e. temperature, acid-base balance, bodily chemicals and other vital life components.
* Homeostenosis – inability of the body to restore homeostasis even after minor environmental challenges e.g. trauma or infection
* Disease vs aging**-** with age, many body functions decline e.g. sugar levels elevate more after eating CHO than they do in younger people. Mental decline that includes more difficulty in learning new languages and increased forgetfulness is termed as normal.
* Longevity- this is the average life expectancy. Factors affecting it include: heredity, lifestyle and environment.
* **PHYSICAL ASPECTS OF AGING**
* **Cardiovascular System**
* Heart disease is the leading cause of death in the aged.
* Heart valves become thicker and stiffer leading to altered cardiac conductivity.
* Heart muscle and arteries lose their elasticity increasing the risk for isolated systolic HTN.
* Left ventricular wall 25% thicker as the heart beats harder to supply energy need to propel blood forward.
* Body’s ability to extract O2 from the blood diminishes. There’s decreased baroreceptor sensitivity with potential for postural HTN.
* Calcium and fat deposits accumulate within arterial walls, and veins become increasing varicosities.
* Respiratory system.
* Less air movement with each breath and less O2 transferred to blood therefore elderly people are less able to perform strenuous activities and have difficulty breathing in high altitudes.
* Decreased alveolar surface area available for gaseous exchange and decreased vital capacity.
* Stiffening of chest wall with declining strength in chest muscles thus expansion of lungs during inhalation is limited.
* There’s decreased ciliary action which can contribute to higher risk of aspiration and respiratory infections.
* Genitourinary system
* Kidneys decrease in size, primarily because of a loss of nephrons
* Glomerular filtration rate decreases.
* Atrophy in supplying blood vessels 🡪 blood flow to kidney decreases
* Proximal tubules decrease in number and length
* Excretion of more fluid and electrolytes at night
* Lower levels of glucose excreted in urine
* Impaired excretion of drugs and metabolites 🡪 “normal” doses create problems
* Change in ability to concentrate urine + decreased thirst 🡪 more susceptible to dehydration. This is due to decreased tubular function
* Bladder becomes more fibrous 🡪 decreased capacity + increased postvoiding residuals
* Normal changes of aging should not affect the ability to respond sexually
  + Males
    - Change in vascular responses 🡪 erection as a result of direct penile stimulation
    - Decreased libido
    - Erection less firm
    - Longer time to ejaculation or difficulty delaying
* Females
* Cessation of menstruation
* Estrogen affects target organs- Vaginal tissues thin, shorten and become less elastic
* Secondary sex characteristics- Facial hair appears, Diminished pubic and axillary hair
* Loss of libido
* Breast tissue is less firm, pendulous, is replaced by fat and the ligaments no longer maintain lobular shape
* Changes in sexual response- Longer period to sexual arousal, decreased vaginal lubrication

* Musculoskeletal system
* Two phases of bone loss in normal aging
  + - Type I (menopausal bone loss)- Rapid, affects women and occurs first 5 to 10 years after menopause
    - Type II (senescent bone loss)- Slower phase and affects both sexes after midlife
  + Bones become stiff, weaker and brittle.
  + Height most obvious – at 20 to 70 years of age (lose 1 to 2 cm in height every 2 decades, shortening of the vertebral column), Midlife (vertebral discs thin) and
  + Later years (decrease individual vertebrae height)

* Mss cont….
  + Muscle mass is lost by half (Sarcopenia) by age 75, Strength declines slowly due to atrophy.
  + Hyaline and knee cartilage wears and tears causing bone to bone contact and slow movement respectively.
  + Ligaments, tendons, and joint capsules lose elasticity, are less flexible leading to a decreased ROM.
* Integumentary system
* Epidermis
  + Less moisture in cells 🡪 dry, rough appearance
  + >50 years epidermal mitosis slows 🡪 longer time to healing + potential for infection

-Melanocytes decrease 🡪 pale complexion + increased UV damage + scattered pigmented areas.

* Dermis
  + Elastin quality decreases 🡪 wrinkling + sagging
  + Collagen disorganized 🡪 loss of turgor
  + Decreased vascularity 🡪 pale complexion
  + Thinning capillaries 🡪 easy damage 🡪 senile purpura
* Subcutaneous layer
  + Atrophy 🡪 thinning features, hands and lower legs
  + Hypertrophy 🡪 increase in proportional body fat
  + Altered melanocytes 🡪 nonpigmented (gray) hair follicles
* Declining hormones leads to
  + Pubic + axillary hair loss
  + Facial hair in women
  + Hair in ears + nose hair in men
  + Balding in men by 50 years of age
* Nails - Dull, yellow, or gray coloration, growth slows 🡪 thicker nails
* Eccrine and Apocrine glands- decrease in size, number and function.
* Sebaceous glands- increased size + decreased sebum 🡪 water evaporation 🡪 cracked, dry skin
* Gastrointestinal system.  
  + Changes in the mouth- loss of teeth, ill-fitting dentures.
  + Salivary flow diminishes🡪 dry mouth.
  + Decreased esophageal sphincter pressure + peristalsis diminished
  + Diminished gastric motility with increased stomach emptying time

-Diminished capacity of the gastric mucosa to resist damage

* Decreased prostaglandin production in stomach and duodenum
* Diminished secretion of acid and pepsin reduces the absorption of iron, calcium, and vitamin B12.
* Decreased production of intrinsic factor
* Decreases in intestinal absorption, motility, and blood flow
* Pancreas size decreases with duct hyperplasia and lobular fibrosis
* Increased incidence of cholelithiasis (gallstones) and decreased production of bile acid synthesis.
* Liver size and blood flow decrease
* Decreased thirst and hunger drive; constipation
* Decreased mucosal immune function
* Endocrine system
* Decreased secretion of insulin
* Potential for thyroid function problems with systemic symptoms that may be attributed to normal aging
* Decreased sensitivity to insulin resulting in variation of blood glucose levels
* Peripheral tissues may become insulin resistant, especially with obesity
* Hematologic system
* Amount of bone marrow in long bones declines
* Number of stem cells in marrow decreases
* Erythropoietin to stimulate iron to form RBCs is less effective
* Lymphocyte function, especially cellular immunity, appears to decrease with age
* Platelet adhesiveness increases increasing chances of hypercoagulability.
* Average hemoglobin and hematocrit values decrease slightly but remain within normal limits
* Neurologic system
* Decrease in short term memory and increased incidence of benign senescence of aging
* Decrease in number of neurons with accumulation of neurofibrially tangles and senile plaques
* Decrease in brain size and weight
* Decrease in blood flow to the brain
* Increased pain threshold, insomnia and sleep disturbances
* Increased reaction time and slowed responses to movement
* Increased incidence of physiologic tremors and impaired coordination
* Depression and mood disorders
* Immune system
* 3 biological defense mechanisms
  + First line (anatomic/biochemical barrier)- Skin and mucous membranes
  + Second line (mechanical clearance)- Skin sloughing, respiratory cilia, and urination
  + Third line (immune response)- Long-lasting and sometimes permanent protection
* 3 immune theories related to aging
  + Autoimmune theory- as a person ages, the ability of the immune system to differentiate between invaders and normal tissues diminishes 🡪 immune cells begin to attack normal body tissues 🡪 conditions
  + Immune deficiency theory- with increasing age, immune system is no longer able to defend body from foreign invaders 🡪 detrimental changes
  + Immune dysregulation theory - multiple changes in immune system 🡪 disrupt regulation between multiple components of immune process 🡪 progressive destruction of body cells
* *Assignment- characteristics unique to the immune system, characteristics of immunoglobulins, types of immunity and immune response, factors affecting the immune response.*
* Decrease in speed, strength, and duration of immune response and regulation of response
* Decreased ability to respond to antigenic stimulation by B lymphocytes
  + Normal secondary response
  + Decreased primary response
* Lower peak antibody response and more rapid decline as person ages
* B cell production decreases Decline in production of Ig E 🡪 decreased allergic reaction or hypersensitivity
* Increase in autoimmune antibody production
* Sensation
* Eye : Graying and thinning of the eyebrows and eyelashes, subcutaneous tissue atrophy 🡪 wrinkling of skin surrounding the eyes, decreased orbital fat 🡪 sunken appearance of eye + sagging of eyelids.
* Pupil- Decreased dilation and constriction, Delayed response 🡪 difficulty responding to changes in light.
* Iris- Loses color🡪 eyes appear gray or light blue. Visual acuity- Diminishes gradually after age 50, decreases rapidly after age 70. Light sensitivity declines with age.
* Ear : External ear- Auricle wrinkles and sags, increased cerumen production
* Inner ear- Atrophy of cochlear neurons, loss of sensory hair cells
* Nose : loss of sense of smell
* Mouth : Diminished sense of taste especially for Protein, Salt and Sweetness
* Hands : Decreased ability to detect temperature extremes
* PREVENTION OF DISEASES AND DISABILITY
* -Preventive medicine aims to prevent diseases from occurring in the first place or to diagnose diseases at an early stage. It depends on:
* Risk profile e.g. age, sex, family history.
* Lifestyle choices e.g. smoking, exercise, nutrition
* Social and physical environment e.g. working conditions.
* -It also involves screening programs e.g. cervical cancer, Pap smears
* **Components**
* These include: a) Vaccinations
* b) Screening programs
* c) Chemoprophylaxis
* d) Counseling
* There are three levels of prevention i.e.
  + 10- disease is stopped before it begins by vaccination, prophylaxis, and depends on profile and age.
  + 20- disease is detected and treated early by use of screening programs
* 30- management of a chronic disease to avoid deterioration by monitoring BS, exercise, provision of rehabilitative and supportive services
* Barriers to prevention
* Health care professionals- lack provision of info, lack interest and time
* Patient- lack knowledge, economic factors, relactancy to make lifestyle changes.
* Health care system- disorganized medical records, inadequate system.
* *Assignment- rehabilitation*