

NURSING STUDY GUIDE (2025)

**Includes: Pathophysiology, Nutrition, Fundamentals of Nursing, Health Assessment, and
Pertinent Concept Maps**

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****DISCLAIMER** These resources originate from students who have previously taken the following courses and have not been approved by the respective faculty! Please ensure to use this guide to reinforce your learning, NOT as your sole study resource.**

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PATHOPHYSIOLOGY

CHAPTER 1

- ❖ Free radicals
 - Reactive molecules present in the body
 - Generated by the body when inefficient mitochondrial metabolism happens
 - They contain a free electron on an oxygen atom
 - The free electron is attracted to cell membranes→attaches to them→ damages them
 - Oxidize cell structures
 - Can cause cell dysfunction
 - Antioxidants
 - DESTROY the free radicals
 - Vitamin A, E, C
 - Beta-carotene
- ❖ Plasma membrane
 - If extracellular fluid is LOWER in water content than ICF→ cell membranes allows water out of ICF→ causing cell to shrink→ cellular dehydration
 - If extracellular fluid is HIGHER in water content than ICF→ cell membranes allows water into the ICF→ causes swelling → edema
- ❖ Sodium-Potassium Pump
 - Potassium ions need to be at a higher concentration inside the cell
 - Sodium needs to be at a higher concentration outside the cell
- ❖ Mitochondrion
 - Mitochondria has its own DNA
 - The DNA is maternal DNA
 - Maternity can be traced through DNA
- ❖ Lysosomes
 - Contain digestive enzymes such as lysozyme, proteases, and lipases
 - Digest particles brought in by endocytosis, pinocytosis, or heterolysis
 - Digest phagocytosis part
 - Enzymes rupture from lysosomes and digest whole cell
 - Wbc have many lysosomes→ process called heterolysis
 - Example

- MI-cardiac muscle cell lysosomes digest dead cardiac muscle cells
 - Serum cardiac enzymes
 - CPK/ MB/ LDH/ SGOT
 - The lysosomal enzymes are drawn to confirm a heart attack occurred
 - MI-myocardial infarction
 - Lack of lysosomal enzymes and disease
 - Can cause a harmful accumulation of non-degraded substances
 - Tay Sachs Disease→ is a lipid (fat) storage disease causing accumulation of ganglioside (a lipid found in the CNS) due to the deficiency of lysosomal enzyme
 - Can cause organ dysfunction and widespread systemic disease
 - Can accumulate in the liver, heart, nervous system, retina, and spleen
 - Caused by deficiency of the enzyme hexosaminidase A (hex-A)
 - Infantile symptoms
 - ◆ Normal first 6 months
 - ◆ Loss of control of mental and physical abilities
 - ◆ Deafness, blindness, inability to swallow, death before 4
 - Juvenile symptoms
 - ◆ Loss of cognitive thinking and motor skills
 - ◆ Speech disorders, difficulty swallowing, loss of coordination
 - ◆ Death before age 15
 - Adult symptoms
 - ◆ Loss of cognitive thinking
 - ◆ Speech disorders, difficulty swallowing
 - ◆ Usually not fatal
 - Lack of proteasomes and peroxisome can cause
 - Adrenoleukodystrophy
 - Damage the white matter of the brain and impairs the adrenal glands
 - ◆ Also called adrenomyeloneuropathy, childhood cerebral ALD, and Schilder-Addison complex
- ❖ Ribosomes
 - Protein synthesis
- ❖ Golgi apparatus
 - Processes protein synthesized by ribosomes
 - Prepares protein for secretion
- ❖ Cilia

- Respiratory tract cells cilia sweeps away debris
- Cilia are found in the lungs
 - Helps to expectorate phlegm

CHAPTER 2

- ❖ When injured cells can
 - Develop adaptive(compensatory) changes to try and maintain homeostasis
 - Develop maladaptive changes (derangements) of structure or function
 - Cell injury can be reversible
- ❖ Terminology
 - Etiology
 - Histology
 - Biopsy
 - Pathognomonic changes
- ❖ Homeostasis
 - Dynamic steady state where the body maintains itself at equilibrium
 - Well-functioning cells can maintain homeostasis
- ❖ Atrophy
 - Decreased cell size muscle atrophy
 - Ex
 - May occur when a client/patient has a cast removed or non usage
 - Causes
 - Disuse or diminished workload
 - Lack of nerve stimulation (paralysis)
 - Loss of hormonal stimulation
 - Inadequate nutrition
 - Decreased blood flow(ischemia)
 - Aging
- ❖ Hypertrophy
 - Increase in cell size
 - Muscle hypertrophy
 - Ex
 - The heart muscle hypertrophies in response to hypertension
 - Weight lifters
- ❖ Hyperplasia
 - The increase in the number of cells
 - Pregnancy→ hyperplasia of breast milk glands and tissue mass
- ❖ Metaplasia
 - When one type of cell is replaced by another type of cell

- Ex
 - Esophagitis→ the cells of the lower esophagus change to be able to cope with the stomach acid that constantly irritates the cells → GERD
 - Cells that are flat epithelial become columnar stomach cells
- Barretts esophagus
 - 10% of people with chronic symptoms of GERD develop Barrett's esophagus
 - Increases the risk of developing esophageal adenocarcinoma
 - A serious potentially fatal cancer of the esophagus
- ❖ Dysplasia
 - Disordered cells that have lost normal architectural arrangement (precancerous condition)
 - A chronic stressor in the cell environment can cause it
 - Must be watched carefully because it can develop into neoplasia
 - Normal cell exposed to carcinogen changes→dysplasia→ neoplasia
 - Can change into cancer cell
 - Neoplasia
 - Lack normal cell function (don't work)
 - Keep dividing uncontrollably
 - Lack adhesiveness to other cells (malignant cancer break away and travel)
 - Invasive and destructive to surrounding cells
 - Abnormal structure and architecture
 - Secrete inappropriate enzymes, hormones, clotting substances, tumor angiogenesis factor
- ❖ Cancer
 - Benign
 - resemble normal cells and do not spread
 - Tissue is well delineated and easily removed
 - Malignant
 - Cells are bizarre looking and spread to other sites
 - Highly invasive into tissue and not well delineated
 - Benign versus malignant
 - Asymmetrical
 - Borders
 - Color
 - Diameter
 - Evolve or change

- ❖ Cell injury
 - Occurs when cells are exposed to a severe stress
 - Cancer cells
 - Heart attack
 - MI-myocardial infarction
 - Causes
 - Hypoxic cell injury
 - Free radical injury(oxidative stress)
 - Physical agents of injury
 - Chemical injury
 - Infectious agent injury
 - Injurious immunological reactions
 - Genetic defects
 - Nutritional imbalances
- ❖ Basic changes that occur when cells are injured
 - Dysfunction of Na⁺/k⁺ pump
 - Disruption of ATP and accumulation of intracellular calcium
 - Deposits of calcium and other minerals
 - Arteriosclerosis- where calcifications accumulate forming plaque(not good for the coronary arteries)
 - Breast lesions containing microcalcification on mammography often indicated malignancy
 - Calcified aortic valve of the heart will impede the blood flow through the heart chambers
 - Loss of plasma membrane integrity
 - Mitochondrial dysfunction
 - Defects in protein synthesis ability
 - Intracellular accumulation may cause injury
 - (excessive amounts of alcohol) familial hypercholesterolemia→a disease passed down that causes LDL to be very high
 - Cellular swelling
 - Genetic DNA damage
 - Xanthelasma-yellow patches filled with accumulated cholesterol
 - Jaundice-accumulation of bilirubin
 - Hyperbilirubinemia-causing yellow pigmentation of sclera of the eyes and skin caused by liver disease and other disorders as well
- ❖ Cellular hypoxia
 - Oxygen deprivation(most common cause of cell injury)

- Cell hypoxia→anaerobic metabolism→ 2 ATP and pyruvic acid→ lactic acid
- Ex
 - Ischemia caused by diminished circulation can lead→to tissue cellular hypoxia (patient with the heart attack/ MI)
 - Anemia→ blood lacks sufficient level of hemoglobin may result in hypoxia
- ❖ Free radical injury
 - Free radicals are reactive molecules present in the environment and generated by the inefficient mitochondrial metabolism
 - Cigarette smoke
 - Pesticides
 - Obesity
 - The free radical has a free electron on an oxygen atom
 - They are sometimes called superoxide molecules
 - Free electron attracted to cell membranes, attached to membranes→ and damages them
 - Free radicals oxidize cell structures→ called oxidants(cause cell dysfunction)
 - The body has natural free radical scavengers→natural antioxidants(destroy free radicals)
 - Vitamins A, E, C and beta-carotene
- ❖ Physical injury of cell
 - Hypertension (HTN) causes shearing type of injury due to the constant increased pulsatile force against the vessels
 - Ex
 - Extreme temperature(burns/frostbite)
 - Electrical shock
 - Sunburn
 - Excessive noise
 - Mechanical traumas
- ❖ Chemical injury of cell
 - High glucose in diabetes causes glycosylation of endothelium
 - Electrolyte imbalances
 - un-controlled (hyperglycemia) diabetes mellitus (DM)
 - Initiates the process of atherosclerosis→ leads to Coronary Artery Disease(CAD), peripheral arterial disease (PAD), cerebrovascular disease at risk for cerebrovascular accident (CVA)

- Aminoglycoside drugs (vancomycin) are nephrotoxic(renal) may result in injury
- ❖ Infectious agents of injury
 - Helicobacter
 - H. pylori erodes gastric mucosa and caused peptic ulcer
 - There is treatment for H Pylori
 - ◆ 2 antibiotics and antacid medication
 - Human Papilloma Virus (HPV)
 - Sexually transmitted disease
 - ◆ Vaccine can prevent it
- ❖ Injurious immunological injury
 - Allergy to peanuts causing allergic reaction and causing inflammation
 - Autoimmune disease such as rheumatoid arthritis(RA)
 - T cells and b cells are triggered by an unknown antigen
- ❖ Nutritional imbalances
 - High LDL cholesterol deposits on endothelial wall→arteriosclerosis
 - Undernutrition
 - Over nutrition
 - Malnutrition where fat is necessary to store fat soluble vitamins
 - Starvation inadequate supply of nutrients for cell processes
 - Protein starvation→ low levels of albumin → leads to fluid shifting from the blood to interstitial spaces(third spacing)
- ❖ Significance of endothelial cell injury
 - Endothelial cells line the artery walls
 - Cover the insides of all the arteries
 - Endothelial injury causes an inflammation reaction→initiates the process of atherosclerosis (reduces nitrous oxide) → resulting in lack of vasodilation
 - Other functions (endothelial cells)
 - Secrete nitric oxide (vasodilator)
 - Secrete endothelin (vasoconstrictor)
 - Secrete thrombogenic substances
 - Causes
 - Hypertension-force against wall of artery damages the endothelium
 - Free radicals-attack endothelium and disrupts its integrity
 - High glucose- uncontrolled diabetes glucose attached to endothelial cells and damages and disrupts their integrity
 - Hyperlipidemia- low-density lipoproteins in the bloodstream combine with WBC and initiate the beginnings of ARTEROSCLEROSIS
 - Consequences

- Nitric oxide is diminished (vasodilation diminishes)
 - Endothelin is secreted (vasoconstriction occurs)
 - Thrombogenic substances secreted (blood within the artery clots more easily)
 - Inflammation occurs with injury → wbc incorporate lipids → foams cells → fatty streak → new atherosclerotic plaque
- ❖ Aneurysm
 - Weakening of the arterial wall
 - Hypertension (HTN) can weaken and rupture the artery wall
 - Turbulent blood flow through the aneurysm → makes wall susceptible to rupture
 - Common sites
 - Aorta and cerebral arteries
- ❖ Apoptosis
 - Cell death
 - Cells that fail apoptosis → can lead to certain cancers
 - Prostate cancer from the prostate gland enlargement
 - Accelerated apoptosis of thyroid results in (Hashimoto's thyroiditis)
 - Ovaries undergo apoptosis in females age 55
 - Wbcs undergo apoptosis after their participation in an inflammatory reaction
- ❖ Cell death
 - ischemia = lack of circulation
 - Prolonged ischemia = infarction (cell death)
 - infarction = ischemic necrosis
- ❖ Prolonged ischemia
 - Any tissue that sustains prolonged ischemic is susceptible to infarction
 - brain = 6 minutes
 - heart = 20 minutes
 - Skeletal muscle = many hours
- ❖ Gangrene
 - Ischemia, infarction, and necrosis of tissue exposed to bacteria that thrive on decaying tissue
 - Clostridium perfringens
 - Anaerobic bacteria → emits a gas identifiable as a foul odor associated with gangrene
- ❖ Embryonic stem cells

- Cells taken from embryo in blastocyst stage
- Blastocyst→ have the potential to become any new organ
 - No incompatibility problems
 - Proposed future treatments for
 - Sickle cell anemia
 - Diabetes
 - Parkinson's disease
 - Tissue repair of skin
 - Replacement organs
- Some adult cells can now be coaxed into the blastocyst stage without fertilization
- ❖ Therapeutic cloning
 - Pluripotent stem cells offer the possibility of renewable source of replacement cells
 - Parkinsons
 - Amyotrophic lateral sclerosis(AML)
 - Spinal cord injury
 - Burns
 - Heart disease (CVD)
 - Diabetes (DM)
 - Arthritis (OA)
 - New alternative to transplant

CHAPTER 4

- ❖ Eustress- stress that positively motivates a person
- ❖ Distress- stress that negatively affects a persons well-being
- ❖ Body mind connection
 - Hans selye
 - Stress response theory
 - Stressor: places a challenging demand on the body that arouses a response from multiple organ systems
 - Can be positive or negative
 - Adaptive ability is the way in which the individual manages the stress and reduces the effect of the stressor on his or her life
 - Homeostasis
 - Blood pressure, respirations, heart rate, oxygen tension, blood PH, blood glucose, body temperature, wbc→ are normal
 - General Adaptation Syndrome (GAS)
 - 3 stages
 - ◆ Alarm

- State of arousal characterized by the central nervous system, sympathetic nervous system (SNS), and adrenal gland stimulation
- Sympathetic nervous system (SNS) known as the adrenergic system (releasing norepinephrine)
- Brain first releases corticotropin → releasing hormone/factor (CRH/CRF) → pituitary ACTH → adrenal gland (epinephrine, cortisol, aldosterone are stored but can be released)
- Posterior pituitary- ADH (acts to keep the of fluid in the bloodstream)
- Long-term increased cortisol levels causes immunosuppression
- ◆ Resistance
 - Body attempts to repel the effects of stress through continual hormone and catecholamine (dopamine, norepinephrine, epinephrine) secretion
 - Time-limited stage
 - When stress subsides, then the SNS and adrenal stimulation abate and the PSNS responses come back → homeostasis
 - Parasympathetic nervous system
 - Also known as cholinergic nervous system
 - Slows down heart rate
 - Constricts the bronchioles
 - Decreases pupil size
 - Enhances gastrointestinal and genitourinary activity
- ◆ Exhaustion
 - Stress overwhelms the body's ability to defend itself
 - Body's resources are depleted and signs of systemic dysfunction occur
 - Symptoms
 - Run-down
 - Unable to cope
 - Depressed
 - Anxious
 - Can feel physically ill

- Long-term (adrenal gland) secretion of cortisol suppresses immunity
 - WBC responses become sluggish and less efficient
- Chronic stress causes atrophy of the thymus gland
 - Decline in T-lymphocytes→ cause of immunosuppression
- Immunosuppression
 - Predisposes the individual to infection and other diseases
 - Illness is commonly experienced at times of prolonged or severe stress
- Exogenous cortisone=prednisone
 - Corticosteroids medicine
 - Treat rashes, asthma, inflammatory bowel disease
 - long -term effects
 - Causes feedback to the adrenal gland→ shuts off natural endogenous cortisol→adrenal gland atrophy occurs→ body begins lacking its natural cortisol
- Walter cannon
 - Fight or flight reaction
- Bruce mcEwen
 - Long-term stress theory
 - Allostasis→ a dynamic state of balance that changes according to exposure to stressors
 - Allostatic load → is the evident wear and tear on body systems caused by stress reactions
 - Repeated stressful experiences
 - Inability of the individual to adapt to stress
 - Prolonged reaction to a stressor
 - Inadequate response to a stressor
 - Adaptive ability
 - Genetic makeup
 - Cognitive ability
 - Developmental status

- Allostatic overload
 - When the stress exceeds the body's ability to adapt → pathophysiological disorders
 - If reduced may be able to re-establish homeostasis
 - Symptoms
 - ◆ nervousness/ irritability/ headaches/ lack of concentration ability/insomnia/ changes in appetite/ depression/ panic attacks
- Elderly
 - Have less resilience/resistance against stress
 - Body requires more time
- Treatment for clients
 - Lifestyle changes (reduce caffeine intake, increase exercise, achieve proper nutrition)
 - Stress management programs
 - Psychotherapy
 - Alternative medicine
 - pharmacology
- ❖ Coping mechanisms
 - Adaptive ability- depends on coping mechanisms and conditioning factors
 - Emotional and behavioral responses used to manage threats to physiological and psychological homeostasis
- ❖ An individual's reaction to stressor is influenced by conditioning factors (life experiences, educational level, etc)
- ❖ Stress
 - Neurological-activation
 - Endocrine-activation
 - Immune-suppression
- ❖ Sleep deprivation
 - Irritability and moodiness are symptoms
 - Can cause
 - Apathy (lack of interest)
 - Slowed speech
 - Flattened emotional responses
 - Impaired memory
 - Poor judgment
 - Inability to multitask
 - Extreme sleep deprivation causes a person to fall into microsleeps

- Results in lapses of attention and possible hallucinations (auditory and/or visual)
 - Obstructive Sleep Apnea (OSA)
 - Common cause of non-restorative sleep
 - There is cessation of breathing
 - Nurses need to time the apneic episodes as the heart rate decreases, oxygen saturation decreases → higher incidence of having a heart attack/ MI
 - Caused by the relaxation of pharyngeal soft tissue that collapses over the airways during sleep
 - Symptoms
 - Excessive daytime sleepiness
 - Snoring and repetitive pauses in breathing
 - Headaches
 - Polysomnography should be ordered for diagnosis
- ❖ Serotonin
 - Also become depleted during stress
 - It promotes feelings of calm, personal security, relaxation, confidence, and concentration
 - Lack of it causes lack of feelings of well-being
 - Pineal gland produces derivative melatonin
 - Influences sexual development/ sleep-wake cycles/ seasonal functions
 - Tryptophan
 - One of the essential amino acids obtained from dietary sources (precursor to serotonin)
 - Sources → meats/ soy products/ some kind of cheese/ milk/ brown rice/ and peanuts
 - Ingesting carbs is the greatest dietary stimulus for release of insulin → enhance the uptake of amino acids into muscles → allow the brain to absorb tryptophan → once in brain converted to serotonin → some converted into melatonin
- ❖ Psychotherapy
 - Cognitive behavioral therapy
 - Interpersonal therapy
- ❖ Pharmacology
 - Antianxiety agents (sedatives)
 - Sleep medications

- Antidepressants
- ❖ Decubitus Ulcer
 - Stage 1- erythema and irritation of skin
 - Stage 2- loss of skin layer or may be a blister
 - Stage 3- loss of skin and dermal layer with ulceration
 - Stage 4- loss of skin, dermis, muscle, down to bone-actually often see the bone
- ❖ Exercise stimulates the growth of collateral blood vessels (angiogenesis) → formation of new blood vessels

CHAPTER 5

- ❖ Statistics
 - 32% of adult men and 35% of adult women in the U.S. are obese
 - Overweight and obese → 72% for men and 64% for women
- ❖ Adipose cells
 - Can increase in number and can hypertrophy to increase fat mass
 - Major areas of storage
 - Subdermal tissue and omentum(covering over the intestines)
 - Ex
 - Fatty liver disease which can lead to cirrhosis leads to NAFLD (non alcoholic fatty liver disease)
- ❖ Obesity genes
 - Children who are obese- 5% have mutations at 2p23 and 18q21.3
 - Persons who lack the leptin gene or have leptin receptor gene mutations at 7q31 are found to be obese
 - Some patients with enzyme alterations cause by a mutations at 5q15-21 have significant obesity
 - Severe obesity is seen in individuals with mutation in an adipocyte transcription factor gene at 3p25
- ❖ Adipokines
 - Circulating hormones that communicate with other other organs
 - Adipocytes- metabolically active and secrete a wide variety of substances referred to as adipokines
 - Tumor necrosis factor alpha (TNF-alpha)
 - Interleukin-6 (IL-6)
 - Angiotensinogen (AGT)
 - Plasminogen activator inhibitor (PAI)
 - Adiponectin
 - Positive effects
 - ◆ Enhances cellular sensitivity to insulin

- ◆ Exerts anti-inflammatory effects
- ◆ Protective against the formation of arteriosclerosis
- ◆ Adiponectin is a good adipokine
- ◆ Has an inverse relationship with the fat content or adiposity
 - The lower the adiposity the greater amount of adiponectin produced
 - The greater the adiposity the less adiponectin produced
- Leptin
 - Increase in fat → increase in leptin
 - Leptin signals the brain that the body has had enough to eat
 - Obese individuals are resistant to leptin
 - ◆ Decrease feeling of satiety (full)
 - Leptin molecules are released from white fat tissue during a meal → travel through the blood stream into the brain (specifically the hypothalamus) → they signal that the stomach is full
 - People who are obese have plenty of leptin in their blood but it fails to lead to signaling satiety
 - Works with adiponectin to enhance cellular sensitivity to insulin → reduce triglycerides levels and inhibit fat accumulation
 - obesity → you will have the resistance to leptin and therefore adiponectin
- Resistin (bad)
 - Is a type of adipokines (bad type) found in the blood of those with obesity
 - Causes insulin resistance
 - Enhances hepatic glucose production → raises triglycerides levels → reduced hdl levels → causes endothelial dysfunction that predisposes an individual to early arteriosclerotic lesion formation
- Angiotensinogen (AGT) (bad)
 - Is a precursor to Angiotensinogen II → a potent vasoconstrictor
 - Adipose tissue → AGT → increased vascular tone
 - AGT → hypertension and vascular changes of arteriosclerosis which lead to vascular problems
 - ◆ Heart disease CAD (coronary artery disease)

➤ Bad adipokine

- Plasminogen Activator inhibitor
 - Adipose tissue → PAI → blocks the action of tissue plasminogen activator (tPA)
 - ◆ tPA = dissolves clots - which is a good action
 - With obesity → PAI blocks the action of fibrinolysis
 - Obesity increases susceptibility to clot formation
 - ◆ MI
 - ◆ DVT
 - ◆ PE
 - ◆ CVA - caused by emboli not aneurysm

❖ Inflammatory mediators (tumor necrosis factor (TNF) and Interleukin-6 (IL-6))

- What are their negative effects
- They reduce cellular insulin sensitivity
- Blunt the beneficial effect of adiponectin
- Promote lipolysis (bad)
 - Lipolysis causes formation of free fatty acids (FFA) → which have negative effects on the body
 - FFA → injury to mitochondria → organ dysfunction
 - An oversupply of FAs is highly detrimental → increased concentration of nonesterified FAs disrupt the integrity of biological membranes → alter cellular acid-base homeostasis and elicit the generation of harmful bioactive lipids
 - ◆ These effects impair membrane function and induce endoplasmic reticulum stress, mitochondrial dysfunction, inflammation, and cell death
 - ◆ Deleterious effects are subsumed under the term lipotoxicity

❖ Ghrelin

- Peptide secreted by stomach
- Stimulates hunger
- Regulates food intake
- Stimulates growth hormone

❖ Risk factors for obesity

- Excess calorie intake vs output
- Sedentary behavior
- Poverty

- Culture
- Age
- Female gender
- Smoking cessation
- Genetics
- Secondary disorders that causes obesity
 - Cushing's disease
 - Hypothyroidism
 - Pregnancy
- ❖ Overweight measures
 - overweight/overweightness= 20% or more over ideal weight
 - obesity= 30% or more over ideal weight
 - Morbid obesity= 40% or more over ideal weight
- ❖ Obesity as cardio risk
 - Apple-shaped central obesity is associated with cardiovascular disease risk
 - Waist measurement
 - Women→ exceeds 35in is considered a cardiovascular risk factor
 - Men→ 40in is considered a cardiovascular risk factor
- ❖ Body fat (%)
 - Skinfold calipers is the tool used to estimate an individual's percentage % of body fat
 - Specific sites measured
 - Men: chest, abdomen, and thigh
 - Women: triceps, suprailiac, and thigh
 - Recommended % body fat
 - Males→ 25% or lower body fat
 - Females→ 30% or lower body fat
 - Body mass index (BMI)
 - Weight in pounds x 703/ height in inches/ height (ask)
 - 18.5-24.9 BMI ideal
 - 25-29.9 BMI overweight
 - 30 or greater BMI indicates morbid obesity
 - BMR (basal metabolic rate)
 - Is the minimum caloric requirement needed to sustain metabolic processes in a resting state
 - The calculation is based on
 - Age
 - Sex

- Size
 - Responsible for burning up to 70% of total calories expended per day
 - The remaining 30% of calories are used for activity
- ❖ Weight loss
 - A low-calorie diet creates a caloric deficit of
 - 500 cal/day= 1 pound of weight
 - 1000 cal/day= 2 pounds of weight
 - Low calorie (nutritional therapy)
 - 800 calories or fewer per day
 - Reserved for people with a BMI of 30 or greater
 - Individuals can lose 3-5 pounds per week
 - Appetite suppressants are for short-term use and require health-care provider prescription and follow up primary care provider care
 - Drugs used to curb the hunger
 - Should be used under the supervision of a health-care provider
 - Anti-obesity pharmacological meds/agents
 - Indicated for individuals with a BMI of 30 or greater or a BMI of 27 or greater with medical problems
 - Should be under a physician's care
 - Bariatric surgery
 - Liposuction
 - Associated with a high risk mortality from fluid shifts
 - Vitamin and mineral deficiency especially
 - ◆ B12, calcium, and iron
 - Dumping syndrome can occur
 - ◆ Increase in heart rate/ food transit through the intestine
 - Gastric bypass
 - Gastric banding
 - Nutritional imbalances from bariatrics
 - Thiamine deficiency→ beriberi
 - ◆ Replacement injections or oral doses given to those with ethal alcohol abuse (ETOH)
 - Niacin deficiency
 - ◆ pellagra
 - B6 deficiency
 - ◆ irritability and depression
 - Folic acid/ vitamin b12 deficiency
 - ◆ megaloblastic anemia (increased episodes of depression)
 - Vitamin c deficiency

- ◆ Scurvy
 - ◆ If vitamin c level intake is low then iron will not be absorbed and stored in the body
- Vitamin d deficiency
 - ◆ Decreased GI calcium absorption
 - ◆ If vitamin d serum level is low then the calcium is not going to be absorbed
- Calcium deficit
 - ◆ Decrease bone formation
 - ◆ Early osteoporosis
 - Unnoticed small bone fractures/ breaks
- Iron deficit
 - ◆ Muscle weakness
 - ◆ Cardiac muscle causes lethal arrhythmias (palpitations)
- Sodium deficit
 - ◆ Weakness and GI disturbances
 - Low serum levels patient becomes disoriented
 - When restored to WNL (within normal limits) mentation improves
- Zinc deficits
 - ◆ Inadequate growth
 - Especially secondary sex characteristics
- Vitamin excess
 - Excessive amounts of vitamins are generally defined as 10 times the recommended level
 - ◆ Hypervitaminosis- can be lethal (especially fat soluble vitamins)
 - A, D, E, K - cause toxicity-liver and the kidneys play a huge role in metabolism and excretion
- Eating disorders
 - Anorexia nervosa
 - Bulimia nervosa
 - Binge eating
 - Night eating syndrome
 - Purging
 - Includes self-induced vomiting
 - Laxative abuse
 - Inappropriate diuretic use
 - Excessive exercising

CHAPTER 6

❖ Afferent neurons

- Sensory nerves that carry
 - Pain
 - Temperature
 - Touch
 - Proprioception
 - Vibration
 - Pressure sensations into the spinal cord
- Can be categorized as
 - A-delta
 - Small in diameter and myelinated
 - These fibers conduct impulses rapidly and cause the first, short-lived acute experience of pain
 - C fibers
 - Larger in diameter and unmyelinated
 - Conduct impulses slowly
 - Cause longer lasting persistent dull pain
- Simple reflex arc
 - An afferent neuron carries sensory impulses into the dorsal horn of the spinal cord→ it connects with an interneuron in the substantia gelatinosa (gray matter involve in the transmission of pain, touch) of the spinal cord → the interneuron connects to an efferent neuron that exits via the ventral horn and enacts motor activity

❖ Efferent neurons

- Motor nerves
- Neurons exit the spinal cord through the ventral horn and travel to the muscles of the body

❖ How is the brain involved in pain sensation

- An afferent neuron carries sensory information from the periphery into→ dorsal horn of the spinal cord→ synapses have an interneuron in the substantia gelatinosa→ the interneuron then synapses with another neuron that is within an ascending tract called spinothalamic tract
- Spinothalamic tract
 - Directs sensory neural impulses from the spinal cord up through the brainstem→ to the hypothalamus and upper regions of the brain cortex

- The axons of the spinothalamic tract cross over to the other side of the spinal cord before their arrival in the brain
 - Corticospinal tract
 - From the somatosensory portion of the brain motor neurons descend downward in the spinal cord and cross over at medulla→ to control the opposite side of the body
 - Exit via the ventral horn of the spinal cord to control muscles of the body
- ❖ Nociceptors
 - Afferent neurons that carry the sensations (touch/temperature/vibration) into the dorsal horn of the spinal cord
 - Nerve fibers that respond to noxious stimuli
 - Found in
 - Skin
 - Muscle
 - Connective tissue
 - Bone
 - Circulatory system
 - Abdominal
 - Pelvic
 - Thoracic viscera
- ❖ Neurotransmitters
 - Excitatory or inhibitory chemical mediators
 - Dopamine
 - Serotonin
 - Norepinephrine
 - GABA
 - Excitatory NTs- acetylcholine and norepinephrine
 - Inhibitory NTs- serotonin, dopamine, GABA
- ❖ Endogenous opioids
 - Natural analgesic neurochemicals that inhibit pain sensation
 - Bind to and inhibit receptors in the axons of incoming C and A-delta fibers
 - Carry pain signals of nociceptors from the periphery
 - Ex
 - Endorphins
 - Enkephalins
 - Dynorphins

NUTRITION

Dietary Reference Intakes (DRIs) – a set of five nutrient – based reference values used to plan and evaluate diets.

Chronic Disease Risk Reduction Intake (CDRR) – the level of intake associated with chronic disease risk. Recommendation specifies “reduce intake if above...” For sodium. For a nutrient that is inversely associated with disease risk, such as potassium, the recommendation would be to “increase intake if lower than...”.

Recommended Dietary Allowances (RDAs) – the average daily dietary intake level sufficient to meet the nutrient requirement of 97% to 98% of healthy individuals in a particular life stage and gender group.

Estimated Average Requirement (EAR) – the nutrient intake estimated to meet the requirement of half of the healthy individuals in a specific group.

Adequate Intake (AI) – an intake level thought to meet or exceed the requirement of almost all members of a specific group. An AI is set when there is insufficient data to define an RDA.

Tolerable Upper Intake Level (UL) – the highest average daily intake level of a nutrient that probably poses no danger to most individuals in the group.

Acceptable Macronutrient Distribution Ranges (AMDRs) – an intake range for energy nutrients expressed as a percentage of total calories that is associated with a reduced risk of chronic disease.

Estimated Energy Requirements (EERs) – level of calorie intake estimated to maintain weight in normal – weight individuals based on age, sex, height, weight, and activity.

Healthy Eating Index-2015 (HEI-2015) – a density based (amounts per 1000 calories) measure of a diet quality based on conformance with the 2015 Dietary Guidelines for Americans. It is composed of food and nutrient characteristics that have established relationships with health outcomes. Previous versions were based on previous editions of the dietary guidelines for Americans.

Database – a comprehensive collection of related information organized for convenient access.

Bioinformatics – an interdisciplinary field that uses computer science and information technology to develop and improve techniques that make it easier to acquire, store, and organize, retrieve, and use complex biological data.

Nutrigenomics – the study of the interaction between bioactive food components and genes and how that interaction impacts health and disease.

Biomarker – a measurable biological molecule found in blood, other body fluids, or tissues that is a sign of a normal or abnormal process or of a condition or disease.

Genomics – an area of genetics that studies the sequencing and analysis of an organism's genome.

The best diet that includes a variety of foods is something with proteins, vegetables, fruits, and grains

A practical way **to measure vegetables is a baseball**, and **8 oz of protein is a deck of cards**

Dextrose provides energy to cells and is the most common glucose

Glycemic index is a numeric measure (tool) of how quickly a sugar can make blood sugar (glucose)

RDA calculation 0.8 g/kg divided by kg

Protein metabolism is the breakdown of energy and can be weakened by malnutrition

Most **protein digestion takes place in the small intestine**

All **saturated fats come from animals**

Hydrogenated fats are transfat

Vitamin A can be toxic

High **plant** intake leads to less chronic disease due to the **phytonutrients**

1 ml/cal to calculate how much water you should take 2000 cal should equal to 2000 ml of water

BMI of 25, overweight under 18 is underweight

Waist circumference over 40 males, 30 to 35 for females

1.6 m ² (2.56) /55 kg = 21.5 BMI

Sensible water output is **measurable**

Insensible water loss cannot be measured (e.g. **perspiration**)

FUNDAMENTALS OF NURSING

WAYS TO *Prevent Falls*



	<p>CALL BELLS</p>	<p>Should always be within reach! This is your way of contacting you if you are busy with another patient.</p>
	<p>NON-SKID SOCKS!</p>	<p>These are non-slip, bright to show fall risk status, and should be on at all times when out of bed.</p>
	<p>PLACE NEAR THE NURSES STATION</p>	<p>Place high risk patients near the nurses' station. A patient who continues to exit the bed without help or is disoriented would be better near the nurses' station where there is more help and supervision.</p>
	<p>EDUCATE</p>	<p>Many patients are used to being independent at home. They may not want to "bother" the nurse or may say they "do not need help." While respecting their independence, educate them on the importance of calling for help. As we said, medications, IVs, surgery- they can ALL contribute!</p>

ADVENTITIOUS LUNG SOUNDS

made easy







	SOUND	MEMORY TRICK
FINE CRACKLES	Soft, high pitched crackling/bubbling sounds	Fine crackles think S oft crackling- S nap, crackle, pop! 
COARSE CRACKLES	Loud, low pitched, wet bubbling sounds	Coarse crackles think L OUD- shoveling rocks 
WHEEZING	Continuous high pitched musical sound	Wheezing think W histle 
RHONCHI	Low-pitched snoring sounds	Rhonchi think sno Ring 
STRIDOR	Harsh, high-pitched whistling or gasping	Stridor think S eal 
PLEURAL FRICTION RUB	Rough, grating sound of the pleura	Pleural Friction R ub think pleura R ubbing against each other 

Nursing Delegation

CNA/UAP	LPN	RN
<p>Stable Patients Only Or 24 hours post OP</p> <p>Tasks ADL's Cleaning, Bathing, Ambulating, Oral care, Toileting, Linen care Position Change, and I/O's if stable</p> <p>Feeding / if no swallowing issues Cleaning, Bathing, Ambulating, Oral care, Toileting, Linen care and I/O's if stable</p> <p>Vital signs for stable Pt</p> <p>↓ CAN NOT DO ↓ Meds teaching, assessment Planning or Evaluating</p>	<p>All UAP duties Only Gather / monitor data for RN, They do not interpret</p> <p>Stable Patients with predictable outcomes Chronic / but stable</p> <p>Routine procedures Blood glucose, Foley, EKG, Suctioning, Tracheostomy care</p> <p>Can implement care but not plan it. Can give meds/ injection, Narcotics not 1st IV, or IV Meds</p> <p>NO =teaching, assessment Planning or Evaluating</p>	<p>All previous duties</p> <p>Teaching All education needs</p> <p>Assessments Initial and clinical</p> <p>Planning Care of patient</p> <p>Evaluating</p> <p>Unstable Patients Can do Invasive procedures and care</p> <p>Can do full ADPIE</p> <p>Can give meds, IV, and blood</p>

Electrolyte Functions

NURSE
IN THE MAKING

ELECTROLYTE	MEMORY TRICK	
 <p>SODIUM</p>	<p>Sodium Swells (sodium causes the body to retain water)</p>	<p>SODIUM think BRAIN: The brain does not like when sodium is out of whack! Expect to see neuro changes with sodium imbalances</p> 
 <p>POTASSIUM</p>	<p>Potassium Pumps (potassium helps the heart muscle to pump out blood to the body)</p>	<p>POTASSIUM think HEART: Potassium imbalances can cause cardiac dysrhythmias that can be life-threatening</p> 
 <p>PHOSPHORUS</p>	<p>Phosphorus think Perfect teeth</p>	<p>PHOSPHORUS think TEETH: Phosphorus helps the body to use vitamins to maintain tooth and bone health</p> 
 <p>CALCIUM</p>	<p>Calcium think Creating bone</p>	<p>CALCIUM think BONES: A client with a calcium imbalance is at risk for pathological fractures</p> 
 <p>MAGNESIUM</p>	<p>Magnesium Manages Muscle</p>	<p>MAGNESIUM think CALM & SEDATED: This causes ↓ vital signs</p> 
 <p>CHLORIDE</p>	<p>Chloride think Carrying fluids</p>	<p>CHLORIDE think CELLULAR: Maintains healthy fluid volume in the cells</p> 

BOWEL ELIMINATION

25

Factors Affecting Bowel Elimination:

- * **Age:**
 - * Children do not have bowel control until the age of 2 or 3.
 - * Older adults have decreased peristalsis and gastric emptying.
- * **Diet**
- * **Fluid intake**
- * **Psychological factors**
- * **Physical activity**
 - * Immobilization suppresses peristalsis.
- * **Positioning:**
 - * Immobile patients cannot maintain normal "squat" position.
- * **Pain**
- * **Surgery**
- * **Medications**



Constipation:

- * Difficult or infrequent elimination of hard, dry stool.
- * **Causes:**
 - * Improper diet
 - * Reduced fluid intake
 - * Immobilization
 - * Medications
 - * Advanced age
- * **Complications:**
 - * Fecal impaction
 - * Hemorrhoids, rectal fissures
 - * Bradycardia, hypotension, syncope
- * **Interventions:**
 - * Increase fiber and water consumption.
 - * Give stool softeners or suppositories.



Impaction:

- * Hardened stool becomes stuck in the rectum and can not be expelled.
- * Main indication is the patient being unable to pass stool for several days.
- * Can be removed with cleansing enemas, suppositories, or digital removal.

Diarrhea:

- * Frequent loose or liquid stool.
- * **Causes:**
 - * Viral and bacterial infections of the GI tract.
 - * Antibiotic therapy
 - * Inflammatory bowel disease
 - * Irritable bowel syndrome
- * **Complications:**
 - * Dehydration
 - * Skin breakdown of perineal area
 - * Fluid and electrolyte imbalances
- * **Interventions:**
 - * Determine cause
 - * Apply moisture barrier after perineal care

Characteristics of Stool:

- * **Normal:**
 - * Yellow, brown
 - * Soft and formed
- * **Abnormal:**
 - * White/clay, black, red, bloody
 - * Foreign bodies, oily, hard, or liquid

Ostomies:

- ① **Colostomy:**
 - * Ends in the colon
 - * More formed stool
- ② **Ileostomy:**
 - * Ends in the ileum
 - * Frequent liquid stool



Ostomy Care:







- * Empty pouch when 1/2 to 1/3 full
- * Assess for skin breakdown every time the pouch is changed.

Specimen Collection:

- ① **Fecal occult blood testing:**
 - * Measures amounts of blood in the stool.
 - * Small amounts of stool are placed onto a test card with an applicator.
- ② **Stool culture for parasites/ova:**
 - * Sample is placed into a clean specimen container.

TYPES OF Oxygen Masks

NURSE IN THE MAKING™

NASAL CANNULA "LOW-FLOW"		<ul style="list-style-type: none"> Two prongs (one for each nostril) – these point down! Loops behind the ears, not the head Can be ordered as humidified to decrease nasal irritation/dryness
SIMPLE MASKS "LOW-FLOW"		<ul style="list-style-type: none"> Air holes on both sides let outside air enter, and exhaled air to exit Fits to face with strap around head
NON-REBREATHER MASK "HIGH-FLOW"		<ul style="list-style-type: none"> One way valves prevent outside air from entering Reservoir Bag: holds oxygen as a "reservoir" source for patient as they breathe
HIGH-FLOW NASAL PRONG THERAPY (HFNP) "HIGH-FLOW"		<ul style="list-style-type: none"> Similar set-up to nasal cannula, but with high flow oxygen Humidify if ordered to prevent dryness of mucous membranes
VENTURI MASK "HIGH-FLOW"		<ul style="list-style-type: none"> Most precise O₂ delivery without intubation (controlled percentages of O₂) <p>MEMORY TRICK Venturi Mask think Very accurate O₂</p>
FACE TENT "HIGH-FLOW"		<ul style="list-style-type: none"> Good for pts with facial trauma, burns, or who will not tolerate a fitted mask Provides humidification

Characteristic	Respiratory Alkalosis	Respiratory Acidosis
Cause	Hyperventilation (CO ₂ loss)	Hypoventilation (CO ₂ retention)
pH	Increased (> 7.45)	Decreased (< 7.35)
CO ₂	Low (< 35 mmHg)	High (> 45 mmHg)
Bicarbonate (HCO ₃)	Normal or slightly decreased	Normal or elevated (compensating by retaining HCO ₃)
Compensation	Kidneys decrease bicarbonate	Kidneys retain bicarbonate

Parameter	Respiratory Alkalosis	Respiratory Acidosis
pH	Greater than 7.45 (alkalotic)	Less than 7.35 (acidic)
CO ₂ Levels	Low CO ₂ (< 35 mmHg)	High CO ₂ (> 45 mmHg)
Bicarbonate (HCO ₃)	Normal or slightly decreased (kidneys excreting bicarbonate)	Normal or elevated (kidneys retaining bicarbonate)

Parameter	Metabolic Acidosis	Metabolic Alkalosis
Cause	Increased production of acids (e.g., diabetic ketoacidosis, lactic acidosis), loss of bicarbonate (e.g., diarrhea), or kidney failure.	Loss of acids (e.g., vomiting, gastric suction), excess bicarbonate (e.g., excessive antacid use), or diuretic use.
pH	Decreased pH (< 7.35), indicating acidity.	Increased pH (> 7.45), indicating alkalinity.
Bicarbonate (HCO₃)	Low bicarbonate levels (< 22 mEq/L), as the body tries to compensate by excreting acids.	High bicarbonate levels (> 28 mEq/L), as the body tries to compensate by retaining bicarbonate.
CO₂ Levels	Compensatory decrease in CO ₂ (respiratory compensation) to raise pH. CO ₂ < 35 mmHg.	Compensatory increase in CO ₂ (respiratory compensation) to lower pH. CO ₂ > 45 mmHg.
Causes of Compensation	Respiratory compensation (hyperventilation) to expel CO ₂ and raise pH.	Respiratory compensation (hypoventilation) to retain CO ₂ and lower pH.
Common Symptoms	Rapid breathing, confusion, fatigue, headache, nausea, vomiting.	Nausea, vomiting, muscle twitching, confusion, lightheadedness.

Chapter 20

HIA - Hospital Associated Infection (Nosocomial Infection)

Immobile - Folley catheter

- Infections are the no. 1 cause of prolonged stays

Transient flora are pathogens we pick up from the world around us; thorough hand-washing removes the pathogens

PPE - Protective Personal Equipment

Mode of transmission

- Carrier - Asymptomatic
- Direct - Touch, sex, kissing
- Indirect - Contact with fomite

Airborne - droplets include measles, TB, and fungal infections

Stages of infection

- Incubation: HIV and Lyme Disease are usually dormant (Latent)
- Prodromal: Appearance of vague symptoms, not all diseases have this stage
- Illness: Signs and symptoms present
- Decline: Number of pathogens decline

- Convalescence: Tissue repair, return to health

Osteomyelitis requires long-term antibiotics

Exogenous healthcare-related - infection acquired from the healthcare environment

Endogenous health-care-related infection - Normal flora multiply as a result of treatment

Primary defenses - Skin, mucous membranes, nares, trachea, bronchi, tears, GI flora, UT flora

Secondary defenses - Phagocytosis, **complement cascade**, inflammation, fever

Tertiary defenses - Humoral immunity (B-cell production of antibodies in response to an antigen) Cell-mediated immunity (Direct destruction of infected cells by T-cells)

After contact with the patient, you must dispose of contaminated supplies

PPE and supplies - gloves, gowns/aprons, masks and respirators (airborne agents), goggles, face shields

Donning on PPE

- Handwashing → gown → mask → goggles → gloves

Doffing off PPE

- Gloves → gown → goggles → mask → handwashing

Precautions

- Contact - **C. diff** (includes a private room, clean gown and gloves, disposal of contaminated items in the room)
- Airborne - **TB, Chicken Pox, Measles, SARS** Transmission via ventilation systems, the patient must wear a surgical mask upon transport, gown, gloves, special mask
- Droplet - **Rubella, mumps, diphtheria, adenovirus** Coughing, sneezing, touching stay three feet away of the client, wear goggles, mask, and gloves

Chapter 18

ICU vital signs are every 2 hours while med surg is 4 hours

The hypothalamus is our thermometer, and if damaged, it can alter our internal temp. (thermoregulation)

- 98.6 F is normal body temperature (37 C) (Core temperature)
- Tympanic 99.5 F, Forehead (Temporal) 96.4 F
- Rectal measurements are used to represent core temperatures (99.5 F)
- Oral and axillary measurements reflect surface temperatures (98.6 F, 97.7 F)
- Infants lose 30% of body heat through the head
- Old people have lower temperatures

Fevers - In response to pyrogens (bacteria) (febrile vs. afebrile)

- Pyrexia 100 F or 37.8 C
- Hypyrexia 105.8 F (extremely dangerous)

Courses of fever - (first) temp is rising, (second) temp reaches its maximum, (third) temp is back to normal

GO OVER CARDIAC SYSTEM

Systolic - Squeeze

_____ > 120/80 Normal BP

Diastolic - **DIA**lated

Newborns have a fast heart rate

Athletes have lower heart rates

Hypothyroid has slower HR and vice versa

When HR is up, and BP is low, it indicates shock and blood loss

Apical is the bottom of the heart and the most accurate

Normal RR is 12-18

Newborns **RR** is usually 40 to 60 breaths/min.

Respiratory rate decreases in older adults 28 breaths/min. Is considered tachypneic in older adults

Orthopnea - you cannot breathe in a horizontal position

Hypertension stages

- Elevated: 120 -129
- Hypertension stage one: 130 - 139
- Hypertension stage two: 140 and greater

Chapter 3

Assess

Diagnose

Plan

Implement

Evaluate

Auscultation - Inspection, palpation, percussion, auscultation (abdomen: iapp)

Chapter 11

Healthy People 2030's goal is to eliminate healthcare disparities, achieve health equity, and attain health literacy to improve the health and well-being of all people in the U.S.

Ethnicity - Members share a common social and cultural heritage

Race - Based on biological similarities

Acculturation - New members of a group or country that accepts a new culture in time and generations; elements of their original culture are still present.

Assimilation - Gradually take on the beliefs of the dominant culture.

Ethnocentrism - The emotional attitude that one's own race, nation, or culture is superior to all others, thinking your culture is better than other cultures.

Folk medicine - Cultural remedies

Complementary medicine - Acupuncture, meditation, etc.

Alternative medicine - Aromatherapy (used that aren't conventional)

Madeleine Leininger - Cultural theorist in nursing focused on providing culturally congruent care

Discrimination is an action based on prejudice

Chapter 25

Nephrons in the kidneys are in charge of creating urine and helping regulate electrolytes and blood pressure

Flank pain under the peritoneum is a hallmark of kidney infection/disease
Front-to-back wiping is important to prevent bacteria from entering the urethra

Kidneys secrete **erythropoietin, which supplies RBC to bone marrow**, which makes **people with kidney disease anemic because they can't produce it** (a shot of erythropoietin 3x week is the usual treatment); it can also lead to **brittle bones due to lack of vitamin D absorption**.

Kidneys produce **1,500 mL per day or 50 to 60 mL per hour** lower than this is **oliguria**

Frequent urination or polyuria can be a sign of diabetes or UTI

1.002 to 1.030 is the normal value for specific gravity, and its color is straw; infections usually appear as cloudy urine

8-10 wet diapers a day is normal for infants (normal SPG is 1.008)

Nocturnal enuresis: Nighttime bedwetting occurs in a few children aged 6 to 7; most children stop nocturnal enuresis by age 3 to 5.

Toilet training in children (LOOK THIS UP IN BOOK)

Caffeine, chocolate, and tea are natural diuretics that should be considered upon initial assessments

BPH can interfere with voiding by preventing urinary elimination

BUN and Creatinine are used to determine kidney function

A clean catch is a specimen that is **collected through midstream after the first flush of urine, not a sterile procedure**

Sterile specimens are **collected through a straight catheter (single lumen) (brief periods) or indwelling catheter (2 to 3 lumens) (continuous) (has balloons)**

Condom catheters are used for incontinence

A suprapubic catheter is inserted through the bladder via incision

- Catheters should be inserted 2 -3 in for women and 7 to 9 in for men

E. Coli is the number one cause of UTIs; if the infection goes up to your kidneys, it is called pyelonephritis

Urinary drainage bag should be placed below the bladder level

Intermittent irrigation - Commonly used for medication instillation

Continuous irrigation - Maintain patency when blood, clots, or debris is anticipated

Bladder scan greater than 200 to 300 mL of urine may suggest residual

Chapter 24

Anabolism - involves the formation of larger molecules from smaller ones.

Catabolism - involves the breakdown of larger molecules into smaller components. This process releases energy.

Fat-soluble (Vitamins A, D, E, K) should be taken with food

Water soluble (Vitamins B, C) are soluble in kidneys via urine

Vitamin B12 has to be supplemented for vegans and patients who have had gastro surgery (through a monthly IM for gastric bypass patients)

Lifestyle choices

Dietary patterns: The type of food consumed is as important as the amount of food to a person's overall health.

Work environment: Physically demanding work can cause fatigue and affect the quantity and quality of food consumed. When time pressure makes it difficult to prepare and eat healthy food during a short lunch break, some workers may rely on convenience foods to save time.

Cooking methods: Up to half of the water-soluble vitamin content (vitamins B and C) is lost in the cooking water of boiled vegetables. Keeping foods hot longer than 2 hours results in even further loss.

Oral contraceptive use: This method of family planning lowers the serum level of vitamin C and several B vitamins. Women with marginal nutrient intake may need vitamin supplements.

Food to relieve stress: Food is commonly used to cope with stress, depression, loneliness, or boredom. Skipping meals, binge eating, or consuming too much of a single food (e.g., snack foods, chocolate) can result in poor nutrition, obesity, and low self-esteem.

Tobacco use: Smokers use vitamin C, an antioxidant, faster than nonsmokers. The more a person smokes, the more vitamin is lost, and the more the body needs vitamin C to counteract the damage smoking causes to cells. Low levels of vitamin C also are linked to iron deficiency. If the person cannot quit smoking, a vitamin C supplement (2,000 mg/day) may help to compensate.

Alcohol contributes to obesity. A 12-oz beer contains 150 calories; a juice-based cocktail contains about 160 calories. In addition, alcohol significantly decreases the rate of fat metabolism. Excessive alcohol use interferes with adequate nutrition by 1) replacing the food in the person's diet, 2) depressing the appetite, 3)

decreasing the absorption of nutrients by its toxic effects on intestinal mucosa, and 4) impairing the storage of nutrients. People who use alcohol heavily need multivitamin supplements, especially B vitamins and folic acid.

Caffeine: Many of our accepted beliefs about the danger and benefits of coffee are myths. Coffee does not create risk for dehydration, heart disease, or cancer, and has little role in hypertension. Caffeine may be associated with bone loss; however, its negative effect can be offset by a small amount of milk. In high doses, it can sometimes cause anxiety and stomach upset. Caffeine can boost mood and mental and physical performance. It aids the ability to burn fat for fuel instead of carbohydrates and has been linked to a lower risk of Parkinson's disease, type 2 diabetes, stroke, and dementia.

Vegetarianism: Semi-vegetarians are the most inclusive, allowing fish, eggs, and dairy products as well as plant-based foods. Ovo-lacto vegetarians are somewhat more strict; they eat eggs and dairy products, but not fish. Lacto-vegetarians consume only dairy and plant-based foods. Vegans eat only foods of plant origin, and a fruitarian diet includes only fruits, nuts, honey, and vegetable oils. Soybeans, soy milk, tofu, and processed protein products can be used by all but fruitarians to enhance the nutritional value of the diet.

Prealbumin is best to see the patient's nutritional status

Chapter 26

Our kidneys remove our urine waste

Digestion begins upon mastication

Upper GI is from your mouth to your stomach

Hydrochloric acid digests food (below **5.5 pH**)

- NG ends up in your gastric area

The most nutrients absorbed are in the small intestine

Food remains in the stomach for an average of 4 hours. Food leaves the stomach as a liquid, called chyme.

The rectum is highly vascular

Hemorrhoids are protruding blood vessels

The **Valsalva maneuver** is increasing the force in their muscles and holding their breath

A person with heart surgery or glaucoma should be on a stool softener, not a laxative

Water is absorbed in your large intestine

Children need to have the ability to communicate in order to be potty trained

Older adults require extra fiber and are dehydrated (because their water intake decreases)

Peristalsis is increased with activity

Surgery, anesthetics, and narcotics limit peristalsis

Paralytic ileus (intestines don't move through anymore) is a risk factor for those who come out of an abdominal surgery, and their bowel sounds should be assessed frequently, require an NG tube in low interment

Ileostomy - a bowel diversion of the small colon (output will be liquid; yellow)

Colostomy - bowel diversion of the colon (output shape will depend on the location of diversion (ascending colon: liquid effluent, sigmoid; solid feces)

Assessment of GI is (Inspection, Auscultate, Palpate, Percuss,)

Laying on your left side follows the normal curvature of the intestines (also helps with heartburn)

The doctor should explain the procedures (the nurse's job is to obtain consent)

Bananas, rice, applesauce, and toast (BRAT) used to manage diarrhea

Patients who have taken narcotic analgesics, opioids, are depressed, or have a hypoactive thyroid are at **high risk for constipation**

Patients with glaucoma should be observed for increased cranial pressure when having an enema inserted

A doctor must order patient dis-impactions

Patients with a stage four pressure injury should have a Foley catheter and a stool collection device

Toilet training should happen after a meal

Chapter 23

Pharmacokinetics is the absorption, distribution, metabolism, and excretion of a drug (what the body does to the drug)

Pharmacodynamics are the primary and secondary effects of the drugs (what drug does to the body)

have no effect on the disease itself.

Supportive effects support the integrity of body functions until other medications or treatments can become effective.

Substitutive effects replace either body fluids or a chemical required by the body for improved functioning.

Chemotherapeutic effects destroy disease-producing microorganisms or body cells, such as antibiotics and antineoplastic drugs.

Restorative effects return the body to or maintain the body at optimal levels of health.

Nursing Considerations: Medication Administration Safety

1. Before you pour

Check the medication label against the medication administration record (MAR).

2. After you pour

Verify the label against the MAR.

3. At the bedside (FINAL CHECK)

Check the medication again

Six Rights

Right drug

Right dose

Right time

Right route

Right patient

Right documentation

Chapter 22

The patient can experience activity intolerance and can manifest rate, effort, skin, color, pulse rate, or complaints of dizziness

Age level affects bathing; bathing multiple times for adolescents is normal and should involve patient teaching

Patients of older age who have Alzheimer's can forget how to care for themselves

A.M. Care - Appearance and assistance help increase appetite

The patient should be stable to delegate.

P.M. Care - Make sure the call light is within reach.

Plan for several rest periods during morning care

Patients can always refuse care; patients who can bathe themselves should be encouraged to do so

Do assessments (such as pressure injuries in the bony prominences) while giving bedbath

Cut straight when cutting nails to avoid cutting cuticles or toe

- You should not moisturize between the toes
- Only apply lotion between the top and bottom
- DO NOT DELEGATE; leave it to a professional

Clean the eye from the inner to outer canthus with wet warm cloth, cotton ball or compress, do not wash with soap

You can also clean with normal saline every four hours

Chapter 29

Stab wounds (especially in the abdomen) are at great risk for a major complication

Dog bites are not as much as risky as other types of wounds, but they have to be left open, as well as gashes and burns

Contusion - Bruising

Hemo (Blood) Stasis (Stop)

Hydrogen Peroxide kills new skin

Maceration: Softening and breakdown of the skin results from prolonged exposure to moisture. Overhydration of cells related to urinary and fecal incontinence can also lead to maceration and impaired skin integrity. This damage is related to moisture, changes in the pH of the skin, overgrowth of bacteria and infection of the skin.

Pressure: disrupts the blood supply of the wound area. Persistent or excessive pressure interferes with the blood flow to the tissue and delays healing.

Chapter 29


Stool softeners can be prescribed if the patient has had major surgery and is immobile

Range of motion is the maximum movement of the joint

Passive ROM involves moving joints through their ROM when the patient is unable to do so for themselves

Abduction is away from the midline 

Adduction is towards the midline

Dorsiflexion forward DORSI 

Plantarflexion backward foot

Fowler's position is a semi-sitting position, in which the head of the bed is elevated 45 degrees to 60 degrees. This position promotes respiratory function by lowering the diaphragm and allowing the greatest chest expansion. It is also an ideal position for some patients with cardiac dysfunction.

Semi-Fowler's position, in which the head of the bed is elevated only 30 degrees.
High-Fowler's position, in which the head is elevated 90 degrees.

Orthopneic position, the head of the bed is elevated 90 degrees and an overbed table with a pillow on top is positioned in front of the patient. Have the patient lean forward, resting their arms and head on the pillow. This position is helpful for a patient with shortness of breath.

The lateral position is a side-lying position with the top hip and knee flexed and placed in front of the rest of the body. The lateral position creates pressure on the lower scapula, ilium, and trochanter but relieves pressure from the heels and sacrum.

Lateral recumbent position is side-lying with legs in a straight line (see Table 22-1).

Oblique position is an alternative to the lateral position that places less pressure on the trochanter. The patient turns on the side with the top hip and knee flexed; however, the top leg is placed behind the body.

In the prone position, the patient lies on their abdomen with their head turned to one side. This is the only position that allows full extension of the hips and knees. It also allows secretions to drain freely from the mouth and thus is helpful for an unconscious patient.

Sims' position is a semi-prone position where the lower arm is positioned behind the patient, and the upper arm is flexed. The upper leg is more flexed than the lower leg. Sims' position facilitates drainage from the mouth and limits pressure on the trochanter and sacrum. This is an ideal position for administering an enema or a perineal procedure.

The supine position is also known as the dorsal recumbent position. The patient lies on their back with head and shoulders elevated on a small pillow. The spine is aligned with the arms and hands comfortably rest at the side.

Move the weaker leg forward to the cane; weight is divided between the cane and the stronger leg

Chapter 39

Mandatory reporting laws in various states require healthcare workers to report communicable diseases. You also have a duty to report physical, sexual, or emotional abuse or neglect of children, older adults, or the mentally ill, whether you suspect it or have actual evidence of it. The intent is to protect people who cannot protect themselves and protect society against the spread of communicable diseases. Mandatory reporting laws also protect you when reporting abuse. In most instances, the identity of the reporter is kept confidential. **KEY POINT:** The duty to report takes priority over the patient's right to privacy. Therefore, if you report suspected abuse or neglect, you cannot be charged with violating a patient's right to privacy (e.g., under HIPAA).

Good Samaritan laws are designed to protect those who provide emergency care to someone who has been injured from liability. Healthcare providers are protected from potential liability if volunteering away from their place of employment as long as the nurses' actions are not grossly negligent.

Nurse practice acts are statutory laws passed by each state's legislative body that define the practice of nursing. Nurse practice acts are designed to

Protect patients or society.

Define the scope of nursing practice.

Identify the minimum level of nursing care that must be provided to patients.

The provider is covered if he/she administers the level of care that any other prudent individual with the same education would provide.

Quasi-intentional torts involve actions that injure a person's reputation.

Defamation of character

False communication to a third-person

Slander

- Oral defamatory statements

Libel

- Written defamatory statements

Intentional torts is an action taken by one person with the intent to harm another person.

An **assault** occurs when a nurse intentionally places a patient in immediate fear of personal violence or offensive contact. (**THREAT**)

Battery is committed when (1) an offensive or harmful physical contact is made to the patient without their consent, or (2) there is unauthorized touching of a person's body by another person. (**ACTION**) (e.g. performing a procedure without consent).

Chapter 36

Education must occur before surgery

Palliative surgery is performed to relieve discomfort or other disease symptoms without producing a cure. Examples include nerve root destruction for chronic pain.

Minor surgery (Day Surgery) outpatient clinic, same-day discharge, hernia repair, arthroscopy (examines joints), & breast biopsy

4-5 days of morphine (opioids) may increase the risk of addiction

Ablative - remove a diseased body part; appendectomy

Palliative - Most patients with cancer experience pain from the cancer itself and the treatment; this surgery will remove the tumor and may reduce pain; **WILL NOT ERADICATE CANCER**

High glucose damages nerves and vessels (neuropathy can be treated using gabapentin)

We can use TED Stockings and ambulation to reduce the risk of complication

Factors that Contribute to Surgical Risk

- Abdominal wounds are at the greatest risk for infection

Incentive Spirometry - This device helps to increase lung volume and inflation of alveoli and facilitates venous return.- best results when the patient is at a 45-degree angle or sitting up at 90 degrees.

- Exhale slowly through pursed mouth every 1-2 hours while the patient is awake for the first 24 hours after surgery (hold breath for 3 - 5 seconds)

Timeout before procedures are implemented to verify the correct patient, correct procedure, and correct site (final verification if correct)

Chapter 33

Oxygen exchange happens in the alveoli

Counting the breaths only measures rr, and gas exchange can be measured by ABG and pulse oximeter

Bronchoscopy is a sterile procedure; NG tube insertion is clean

Anemia may impact oxygen exchange because it helps transfer oxygen through hemoglobin; it may lead to hypoxia

Lethargy, restlessness, anxiety, hyperventilation, and hypoventilation can be signs of hypoxia

Corticosteroids can help with inflammation, and Beta 2 androgenic helps relax muscles

Sputum sample collection cannot be delegated

The cortex controls breathing

K(ketoacidosis)ussmaul's respirations - increase in diabetic keto acidosis

Over 3 L of Oxygen may cause dryness (needs humidifier)

Chapter 41

Whistleblowing

- **T**alk with an attorney or other legal representation.
- **H**ave concrete and credible evidence of the violation or wrongdoing.
- **I**nstitute a survival plan, if your job is put in jeopardy or you are fired.
- **N**ote the nature and consequences of the problem—its type, severity, and potential impact.
- **K**now your reporting options and support systems.

Autonomy refers to a person's right to choose and ability to act on that choice. It is based on respect for human dignity. You demonstrate respect for autonomy when you treat patients with consideration, believe their stories about the course and symptoms of their illnesses, and protect those who are unable to decide for themselves.

Nonmaleficence is the twofold duty to do no harm and to prevent harm. Nonmaleficence refers to both actual harm and risk of harm, as well as to intentional and unintentional harm. It is rare in nursing to find intentional harm, but unintentional harm does occur, primarily from failure to follow the rights of medication administration. Unintentional harm can also occur because of lack of knowledge, skill, or ability.

Beneficence is the duty to do or promote good. You can think of this principle as being on a continuum with nonmaleficence. At one end of the continuum is the duty to bring about positive good, beneficence, at the other end is the duty to do no harm.

Fidelity (faithfulness) is the duty to keep promises. It is a basic part of every patient care situation. Sometimes the promises are of major significance, such as promising not to share certain information with other members of the healthcare team. At other times it may be only a promise to come back to check the effectiveness of a pain medication or to bring a requested item back to the client's room. The duty to keep a promise is the same regardless of its level of importance.

Veracity is the duty to tell the truth. This seems straightforward, and you may wonder why it even needs discussion. Most nurses would agree that it is not hard to tell the truth, but at times it may be very hard to determine how much of the truth to tell.

Justice is the obligation to be fair. It implies equal treatment of all patients. Questions of justice will become a part of your everyday experience in patient care, from deciding how to allocate your time among patients to larger decisions, such as how to allocate limited healthcare resources.

Chapter 16

Teaching your patient is an independent nursing action.

Patient education is collaborative

Patient participation in HA decisions reduces costs and lowers hospital stays

Cognitive learning includes memorization, recall, comprehension, and the ability to analyze, synthesize, apply, and evaluate ideas

When is it a good time for patient teaching?

Assess patient motivation, language barrier, physical conditions, coordination, age, impaired, etc.

- Patient repetition is key to learning
- Several patient teachings can promote effective learning

It is best to teach patients when they recognize the need to learn

Use Layman's terms and know Literacy levels

Before giving the patient a pamphlet, assess their ability to see

Chapter 15

Intimate distance: <18 in.

Personal distance: 18 in. to 4 feet

Social Distance: 4 to 12 feet

Public distance: 12 feet

Assertive style is essential among professionals

Passive person will say, "do whatever you need to do"

- Will avoid confrontation
- Submissive
- Indecisive

Closed loop communication is yes or no

A Handoff report is required upon every change of shift

Pre-interaction phase: getting a report about the client, orientation of the unit

Orientation phase: Introduction, establishing rapport, reasons for being there, how long you are going to be there

Therapeutic relationship: Working phase

Termination phase: Conclusion of the relationship

Silence is best for crying patients

Sitting down to speak with the patient is the best nonverbal behavior that enhances communication

Chapter 4

Quantitative research: The main purpose of this research is to gather data from enough subjects (people being studied) to be able to generalize the results to a similar population. Generalizing results means that you think, “What I found to be so for this group of people will probably be the same for all people who are similar” (e.g., “My findings for this group of women over age 40 in the United States will probably be useful for all women over age 40 in the United States”). In quantitative research, researchers carefully control data collection and are careful to maintain the objectivity of the process. Quantitative data are reported as numbers.

Qualitative research: This type of research focuses on the lived experience of people. The purpose is not to generalize the data but to describe the experience of the person or persons in the study. This is generally done with interviews, focus groups, journals, observations, and discussions by audio, video, and Internet. Interviews may be highly structured, guided by open-ended questions (descriptive answers to questions), or less structured using a conversational style.

Chapter 28

Nociceptive pain is the most common type of pain. It occurs when pain receptors, which are called nociceptors, respond to stimuli that are potentially damaging; for example, as a result of noxious thermal, chemical, or mechanical stimuli.

- **Nociceptive pain** may occur as a result of trauma, surgery, or inflammation and is most commonly described as aching. Two types of nociceptive pain are: Visceral and Somatic.

Neuropathic pain is a complex and often chronic pain that arises when injury to one or more nerves results in repeated transmission of pain signals even in the absence of painful stimuli. The nerve injury may originate from any of a variety of conditions, such as poorly controlled diabetes, a stroke, a tumor, alcoholism, amputation, or a viral infection (e.g., shingles or HIV/AIDS).

- **Acute pain** has a short duration and is generally rapid in onset. It varies in intensity and may last up to 6 months. This type of pain is most frequently associated with injury or surgery. It is protective in that it indicates potential or actual tissue damage. Although acute pain may absorb a patient's physical and emotional energy for a short time, it is helpful for the patient to know that it will generally disappear as the tissues heal.
- **Chronic pain** lasts 3 to 6 months longer and often interferes with daily activities. Persistent pain is often related to chronic illness (neuralgia related to diabetes), cancer, or musculoskeletal issues (osteoarthritis, traumatic injury). Patients with chronic pain may experience periods of remission and exacerbation. Unlike acute pain, chronic pain is often viewed as insignificant and may lead to withdrawal, depression, anger, frustration, and dependence.
- **Intractable pain** is both chronic and highly resistant to relief. This type of pain is especially frustrating for the patient and care provider. It should be approached with multiple methods of pain relief.

Pain quality may be described as sharp or dull, aching, throbbing, stabbing, burning, ripping, searing, or tingling.

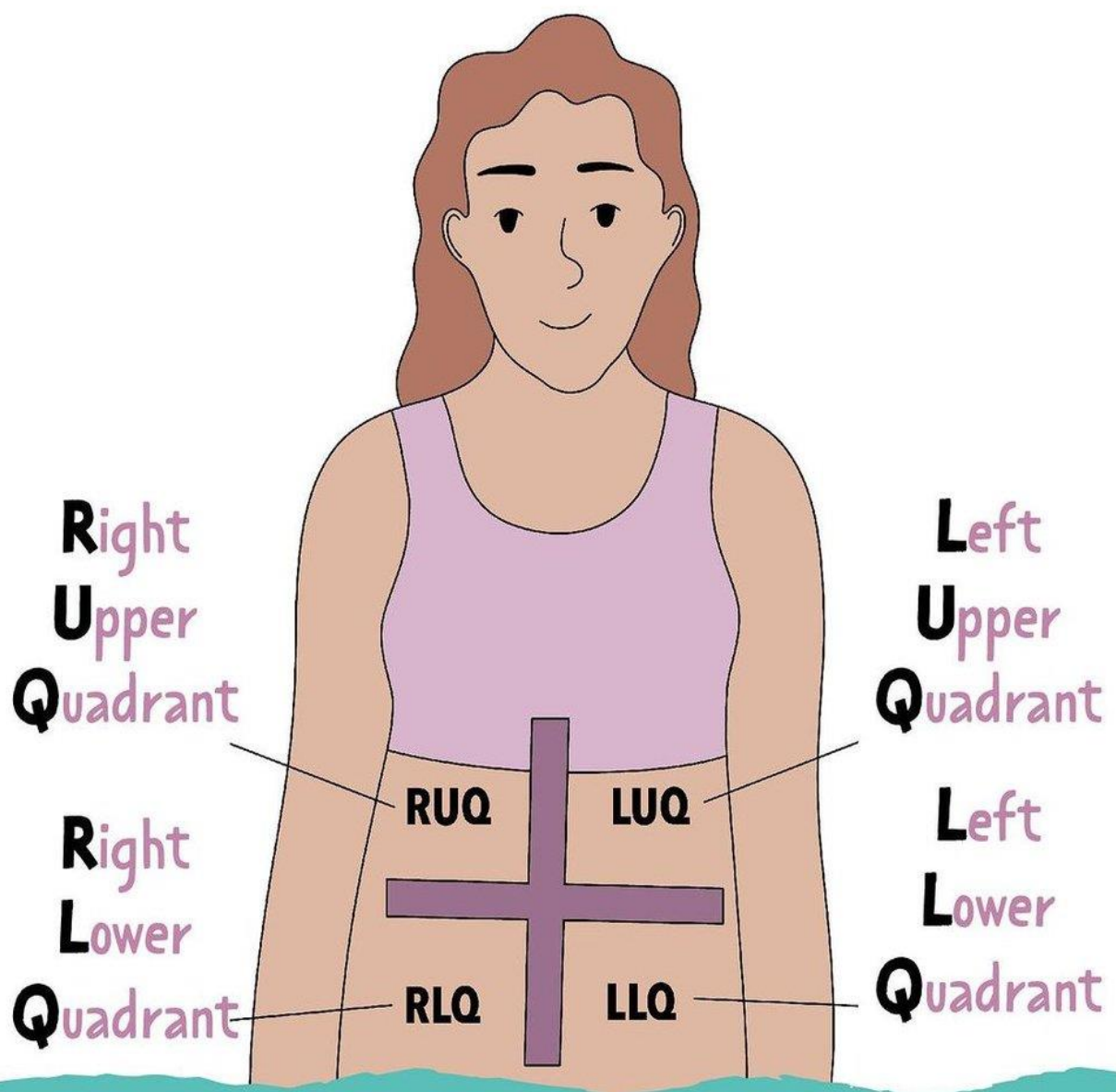
Pain periodicity may be referred to as episodic, intermittent, or constant.

Pain intensity is described with a variety of terms, such as mild, distracting, moderate, severe, or intolerable.

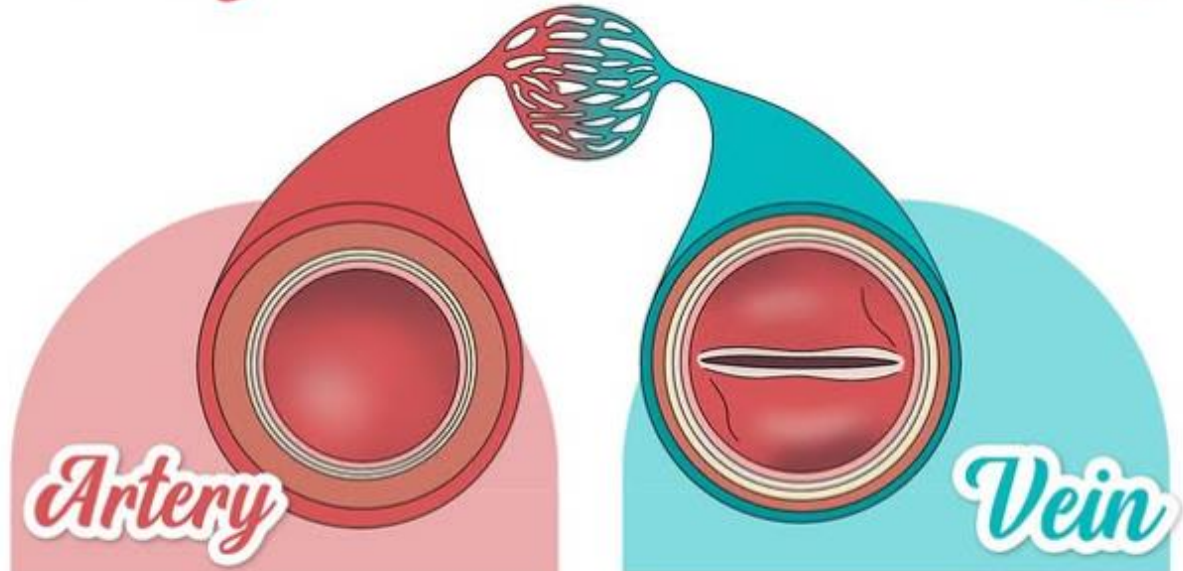
HEALTH ASSESSMENT

ADVENTITIOUS LUNG SOUNDS <i>made easy</i>		NURSE IN THE MAKING [®]
	SOUND	MEMORY TRICK
FINE CRACKLES	Soft, high pitched crackling/bubbling sounds	Fine crackles think S oft crackling- S nap, crackle, pop! 
COARSE CRACKLES	Loud, low pitched, wet bubbling sounds	Coarse crackles think L oud- shoveling rocks 
WHEEZING	Continuous high pitched musical sound	W heezing think W histle 
RHONCHI	Low-pitched snoring sounds	R honchi think sno Ring 
STRIDOR	Harsh, high-pitched whistling or gasping	S tridor think S eal 
PLEURAL FRICTION RUB	Rough, grating sound of the pleura	Pleural Friction R ub think pleura R ubbing against each other 

Abdominal Assessment



Artery vs. Vein



Artery

Vein

Carries
OXYGENATED
blood away from the heart

Carries
DEOXYGENATED
blood back to the heart

Arteries =
Away from the heart



Veins =
Visit the heart

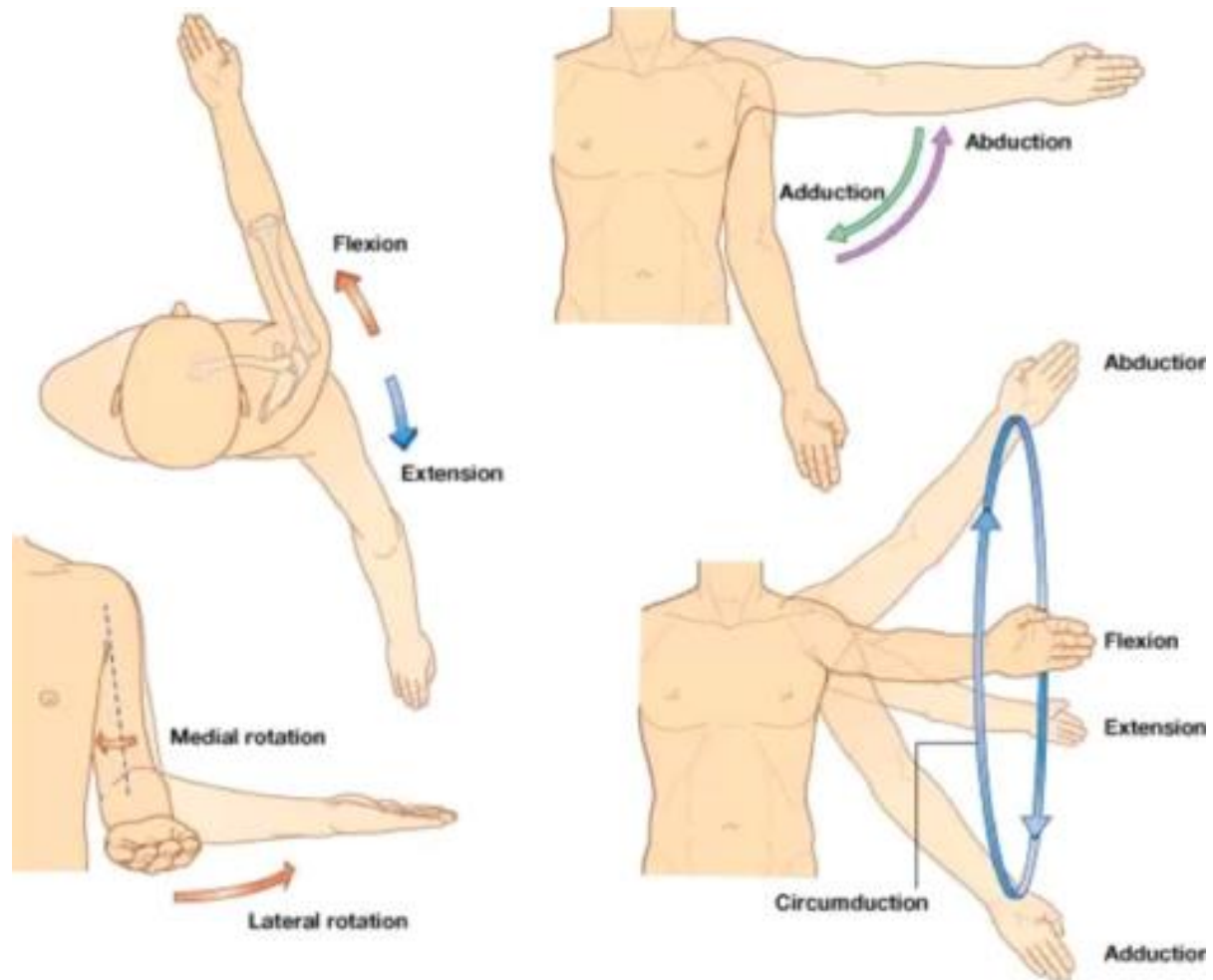
Thick walls with
muscle tissue

Thin walls

No valves

Valves to prevent backflow
Vein = Valves

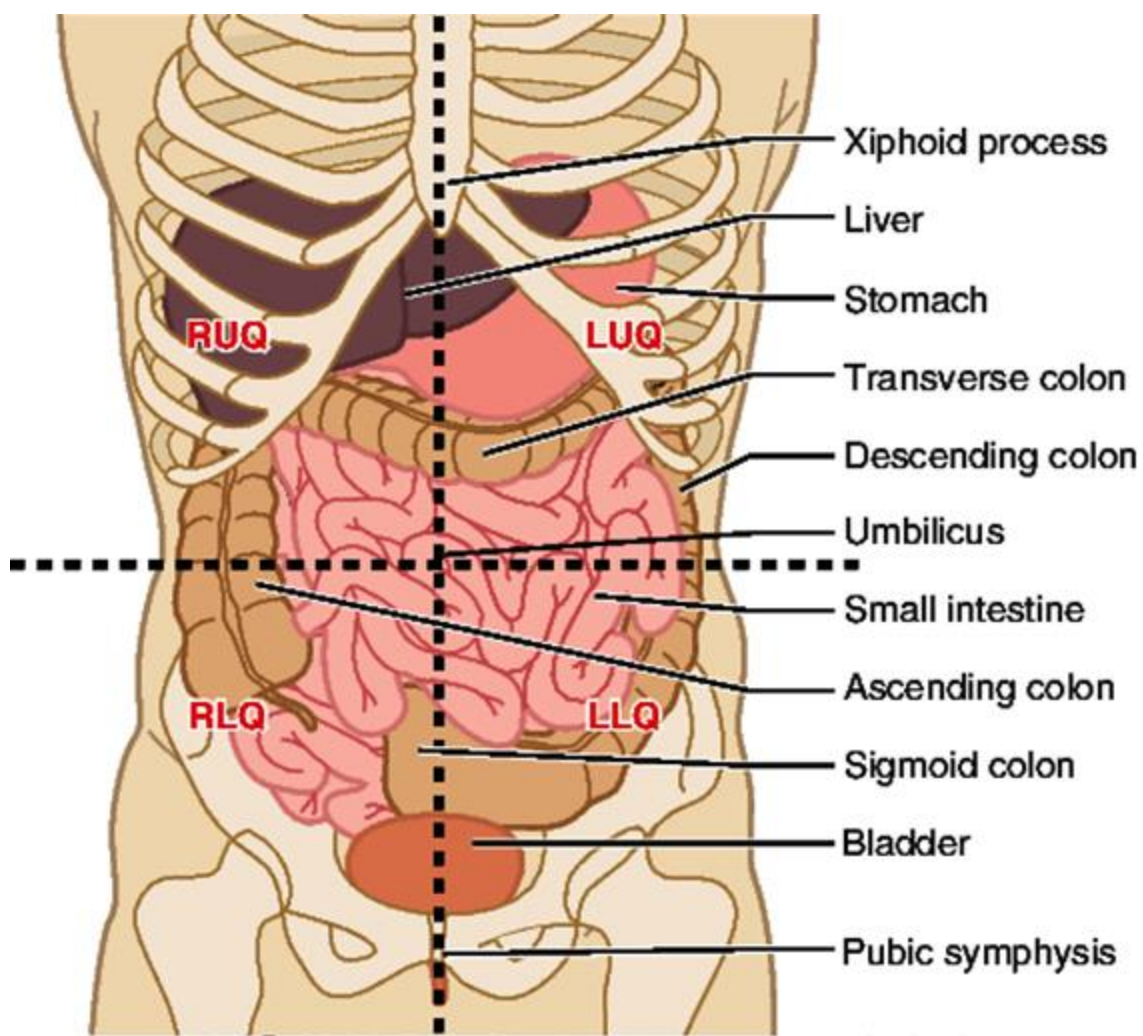




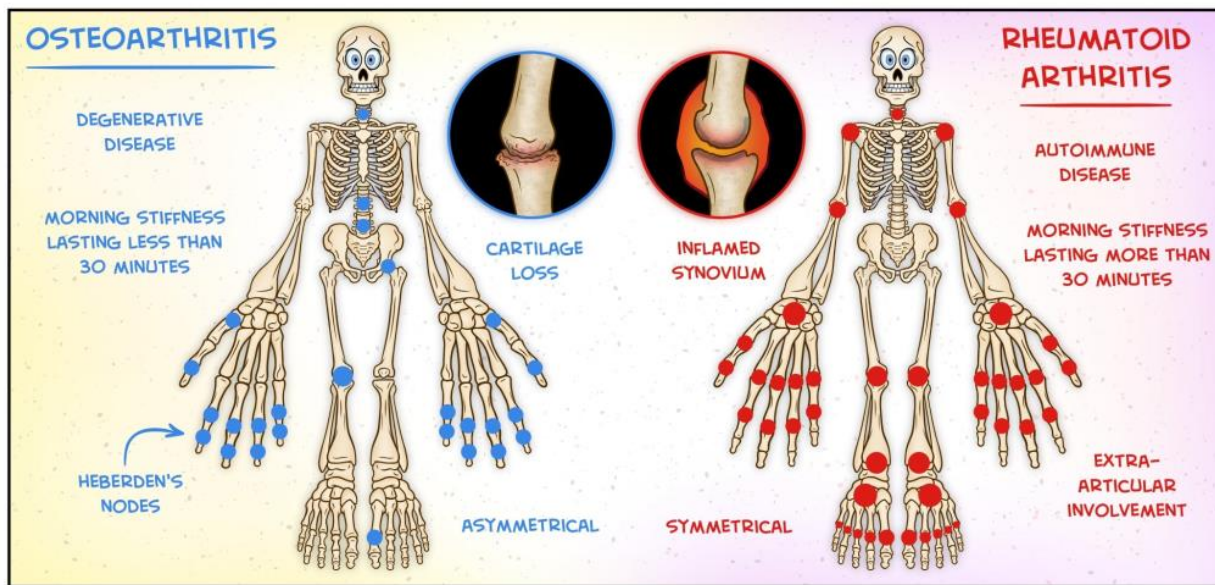
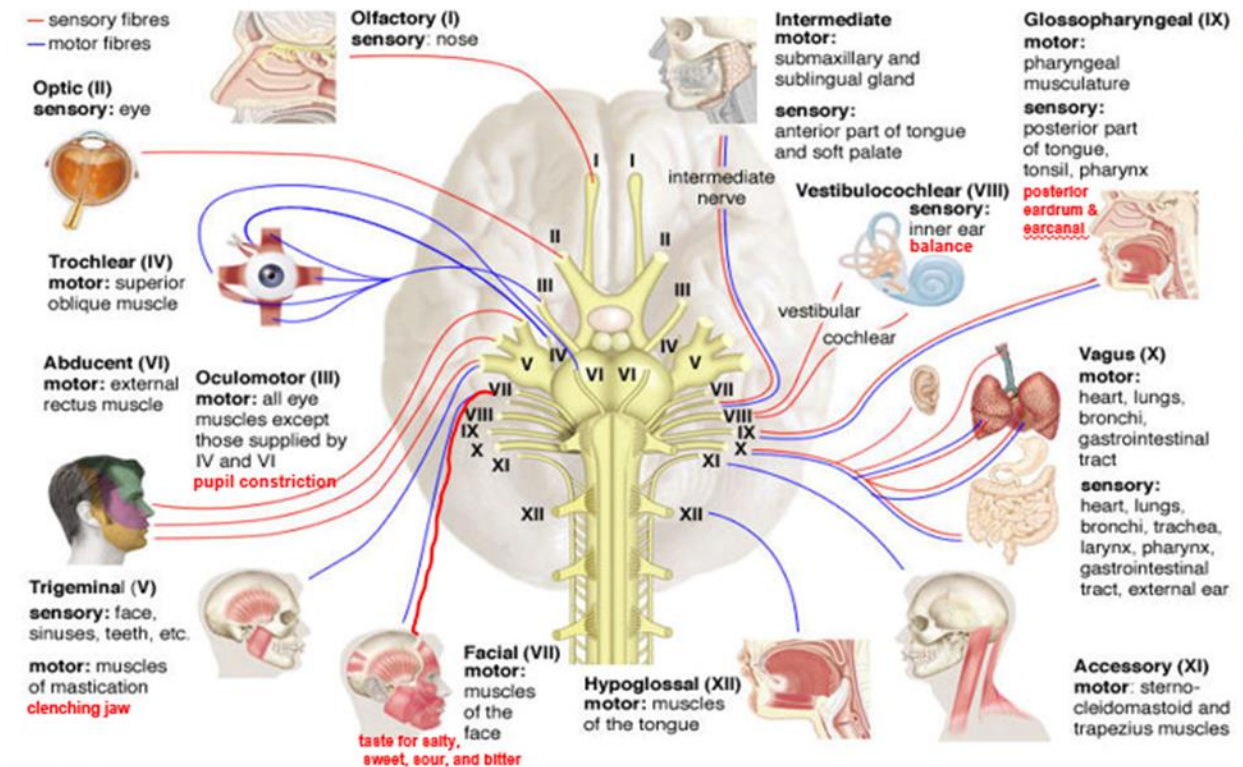
Healthy People 2030

Healthy People 2030 is a campaign that uses a framework for improved health based on the National Health Promotion and Disease Prevention objectives set forth by the Secretary of Health and Human Services advisory committee (Hahn et al., 2018). It identifies health indicators, appropriate interventions and available resources.

The overall goal is to increase quality of life by creating guidelines for a healthy lifestyle as well as educating people and cultivating an awareness that will assist in the elimination of national health disparities. Healthy People 2030 promotes health and disease prevention as it improves the quality and length of a person's life.



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Chronic RA involves Swan Neck Deformations

CONCEPT MAPS

HEART FAILURE

WHAT IS HAPPENING?

↳ THE HEART IS TOO **WEAK** TO PUMP EFFICIENTLY SO IT CAN'T PROVIDE PROPER CARDIAC OUTPUT TO MAINTAIN THE BODY'S METABOLIC NEEDS. (DECREASED BLOOD FLOW → INCREASED HEART PRESSURE)

2 TYPES!

LEFT SIDED

(LEFT FOR LUNGS) DROWNING!

BACK UP OF FLUIDS LEAD TO AN ACCUMALATION IN THE LUNGS!

- PULMONARY EDEMA (CRACKLE)
- ORTHOPNEA ○ PALLOR
- COOL TEMPERATURE IN EXTREMITIES / WEAK PULSE
- PINK FROTHY SPUTUM!!!

LHF CAN LEAD TO RHF!
(NOT THE OTHER WAY AROUND)

RIGHT SIDED

(RIGHT VENTRICLE FAILS → RIGHT ATRIUM → RETURNS TO VENOUS SYSTEM)

- JUGULAR VEIN DISTENTION
- SPLENOMEGALY / HEPATOMEGALY
- ANASARCA (DEPENDENT EDEMA / WEIGHT GAIN)
- ACITES

COPD PATIENTS CAN DEVELOP COR PULMONALE = RHF!

BNP IS A BIOMARKER RELEASED BY VENTRICLES WHEN THERE IS EXCESS PRESSURE IN HEART DUE TO HEART FAILURE

BNP > 100 = HF!

LEFT SIDE OF THE HEART IS SUPPOSED TO PUMP "OXYGENATED" BLOOD TO THE BODY



LEFT



RIGHT



RIGHT SIDE OF THE HEART IS SUPPOSED TO PUMP "DE OXYGENATED" BLOOD TO THE LUNGS

HOWEVER IN HEART FAILURE IT DOES THE REVERSE (BACKS UP!) EX = RH → BODY & LH → LUNGS

REMEMBER!

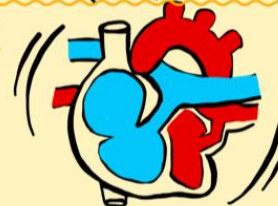
- ♥ PATIENT SHOULD BE ON STRICT I'S & O'S (INTAKE & OUTPUT)
- ♥ FLUID RESTRICTIONS
- ♥ LOW SODIUM DIET
- ♥ ELEVATE LEGS WITH EDEMA

PATIENT IS AT A SAFETY RISK DUE TO FLUID STATUS CHANGES, SWELLING IN LEGS, AND ORTHOSTATIC HYPOTENSION

WATCH OUT!

KEEP AN EYE OUT FOR THESE LAB VALUES

- ↳ BNP (B-TYPE NATRIURETIC PEPTIDE)
- ↳ KIDNEY FUNCTION (GFR & CREATININE)
- ↳ TROPONIN



MEDICATIONS

DIURETICS

↳ USED ALONGSIDE ACE INHIBITORS / ARBS TO DECREASE WATER & SODIUM RETENTION WHICH WILL DECREASE EDEMA IN THE BODY AND LUNGS. IN TURN IT ALLOWS THE HEART TO PUMP EASIER.

↳ SPIRONOLACTONE (ALDACTONE)

♥ POTASSIUM SAVING DIURETIC; PATIENT MAY BECOME AT RISK OF HYPERKALEMIA IN THOSE WITH RENAL INSUFFICIENCY (OR IF TAKING WITH ACE INHIBITORS / ARBS).

↳ FUROSEMIDE (LASIX)

♥ LOOP DIURETIC; DECREASES PRELOAD BY ELIMINATING FLUIDS, POTASSIUM LEVELS COULD DROP TOO LOW OR TOO HIGH WHICH CAN LEAD TO CARDIAC ARRHYTHMIAS (SUCH AS A-FIB). PATIENTS WILL URINATE ALOT.

ACE INHIBITORS

↳ ANGIOTENSIN-CONVERTING-ENZYME INHIBITORS ARE THE FIRST LINE TREATMENT THAT WORK BY ALLOWING MORE BLOOD TO GET TO THE HEART MUSCLE ALLOWING IT TO WORK EASIER. IT BLOCKS THE CONVERSION OF ANGIOTENSIN 1 OR 2 WHICH CAUSES VASODILATION, LOWERS BLOOD PRESSURE, AND ALLOWS KIDNEYS TO SECRETE SODIUM BECAUSE IT DECREASES ALDOSTERONE.

↳ MEDS END IN "PRIL" (CATORPRIL, ENALAPRIL)

↳ SIDE EFFECTS!

♥ DRY NAGGING COUGH! & HYPERKALEMIA (REMEMBER, SINCE IT'S INHIBITING ANGIOTENSIN 2, IT DECREASES ALDOSTERONE IN THE BODY → LEADS TO THE RETENTION OF POTASSIUM BUT EXCRETION OF SODIUM.)

