LaFleur Brooks' Health Unit Coordinating

7th edition

Chapter 22

Medical Terminology, Basic Human Structure, Diseases, and Disorders

Lesson 22.1

UNIT 1: MEDICAL TERMINOLOGY: WORD PARTS, ANALYZING, AND WORD BUILDING

1. Identify the three main origins of medical terms.
2. Name and define the four word parts that are commonly used in building medical terms.
3. List three guidelines to follow when connecting word parts to form a medical term.
4. Define analysis of medical terms.

Lesson 22.1

UNIT 1: MEDICAL TERMINOLOGY: WORD PARTS, ANALYZING, AND WORD BUILDING (CONT'D)

5. Given a list of medical terms and a list of word parts, divide the medical terms into their component parts—that is, word roots, prefixes, suffixes, and combining vowels—and identify the types of word parts present in each term by name.
6. Define synthesis of medical terms.
7. Given a description of a medical term and a list of word parts—that is, word roots, prefixes, suffixes, and combining vowels—write out the medical term that represents a stated medical condition.

MAIN ORIGIN OF MEDICAL TERMS

Greek (e.g., *nephrology*) and Latin (e.g., *maternal)* words

Some terms, such as *triage* and *lavage*, have been adapted from modern languages such as French.

Two other sources include:

- Acronyms
- Eponyms

MAIN ORIGIN OF MEDICAL TERMS, CONT'D

Acronym: formed from the first letters of major terms in a descriptive phrase

- Example: laser – **l**ight **a**mplification by **s**timulated **e**mission of **r**adiation

Eponym: a name given to something that was discovered by or is identified with an individual

- Examples: Pap smear – Dr. Papanicolaou & Lou Gehrig's disease – amyotrophic lateral sclerosis)

FOUR WORD PARTS COMMONLY USED IN BUILDING MEDICAL TERMS

Word root: the basic part of the word; it expresses the principal meaning of the word.

Prefix: placed before the word root to alter its meaning

Suffix: added after the word root to alter its meaning

Combining vowel: usually an o; used between two word roots or between a word root and a suffix to ease pronunciation

THREE GUIDELINES FOLLOWED IN USING A COMBINING VOWEL

When a word root is connected to a suffix, a combining vowel usually is not used if the suffix begins with a vowel.

When two word roots are connected, the combining vowel is usually used even if the second root begins with a vowel.

A combining vowel is not used when a prefix and a word root are connected.

WORD ROOTS

cardi /o heart

cyt/o cell

electr/o electrical activity

enter/o intestines

gastr/o stomach

hepat/o liver

nephr/o kidney

PREFIXES AND SUFFIXES

intra-	within
sub-	under/below
trans-	through/across
-ectomy	excision
-gram	record
-itis	inflammation
-ic	pertaining to
-logy	study of

ANALYSIS OF MEDICAL TERMS

To analyze medical terms, divide the term into word parts with the use of vertical slashes and identify the word part by labeling:

P (prefix)

WR (word root)

S (suffix)

CV (combining form)

ANALYZE THE FOLLOWING MEDICAL TERMS USING THE PREVIOUSLY PROVIDED WORD PARTS

wr cv s

cyt/o/logy study of cells

wr s

gastr/ectomy excision of stomach

p wr s

sub/hepat/ic pertaining to below the liver

wr cv wr cv s

electr/o/cardi/o/gram record of electrical impulses of the heart

wr cv s

cardi/o/logy study of the heart

p wr s

SYNTHESIS OF TERMS

The process of creating a medical term by using word parts

In building medical terms from a given definition, keep in mind that the beginning of the definition usually indicates the suffix that is needed to build the term.

BUILD THE MEDICAL TERMS FOR THE FOLLOWING DEFINITIONS USING THE PREVIOUSLY PROVIDED WORD PARTS

study of the heart

study of cells

surgical removal of the stomach

inflammation of the stomach and intestines

pertaining to the stomach

pertaining to within the stomach

surgical removal of the kidney

MEDICAL TERMS MATCHING THE PREVIOUS DEFINITIONS

cardi/o/logy

cyt/o/logy

gastr/ectomy

gastr/o/enter/itis

gastr/ic

intra/gastr/ic

nephr/ectomy

SPECIAL NOTE

This unit deals with word parts and how they are used together to form medical terms.

It is important for you to master Unit 1 before proceeding to Unit 2, and so forth, because each unit is a continuation of the previously studied units.

Lesson 22.2

UNIT 2: BODY STRUCTURE, INTEGUMENTARY SYSTEM, AND ONCOLOGY

1. Describe the function and structure of body cells.
2. Identify and describe the function of four types of tissue.
3. Explain the structure of an organ and the structure of a system.
4. List five body cavities and name a body organ contained in each cavity.
5. List the four quadrants and nine regions of the abdominopelvic cavity.
6. Define the anatomical position and the directional terms outlined in this unit.

Lesson 22.2

UNIT 2: BODY STRUCTURE, INTEGUMENTARY SYSTEM, AND ONCOLOGY (CONT'D)

7. List four functions of skin.
8. List the seven signs of cancer and describe first-, second-, and third-degree burns.
9. Define abscess, laceration, abrasion, gangrene, infection, and decubitus ulcer.
10. Read the objectives related to medical terminology and demonstrate ability to meet the objectives by completing Exercises 1 through 6.
11. Define the unit abbreviations.

BODY CELLS

- The basic unit of all living things
- The human body is made up of trillions of cells.
- Perform specific functions
- Size and shape vary according to function.
- Bones, muscles, skin, and blood are all made up of different types of cells.
- Body cells are microscopic.
- Constantly growing and reproducing

THREE MAIN PARTS OF A BODY CELL

Cell Membrane (egg shell): boundary of cell

- Passively regulates movement of a substance into and out of cell
- Keeps the cell intact

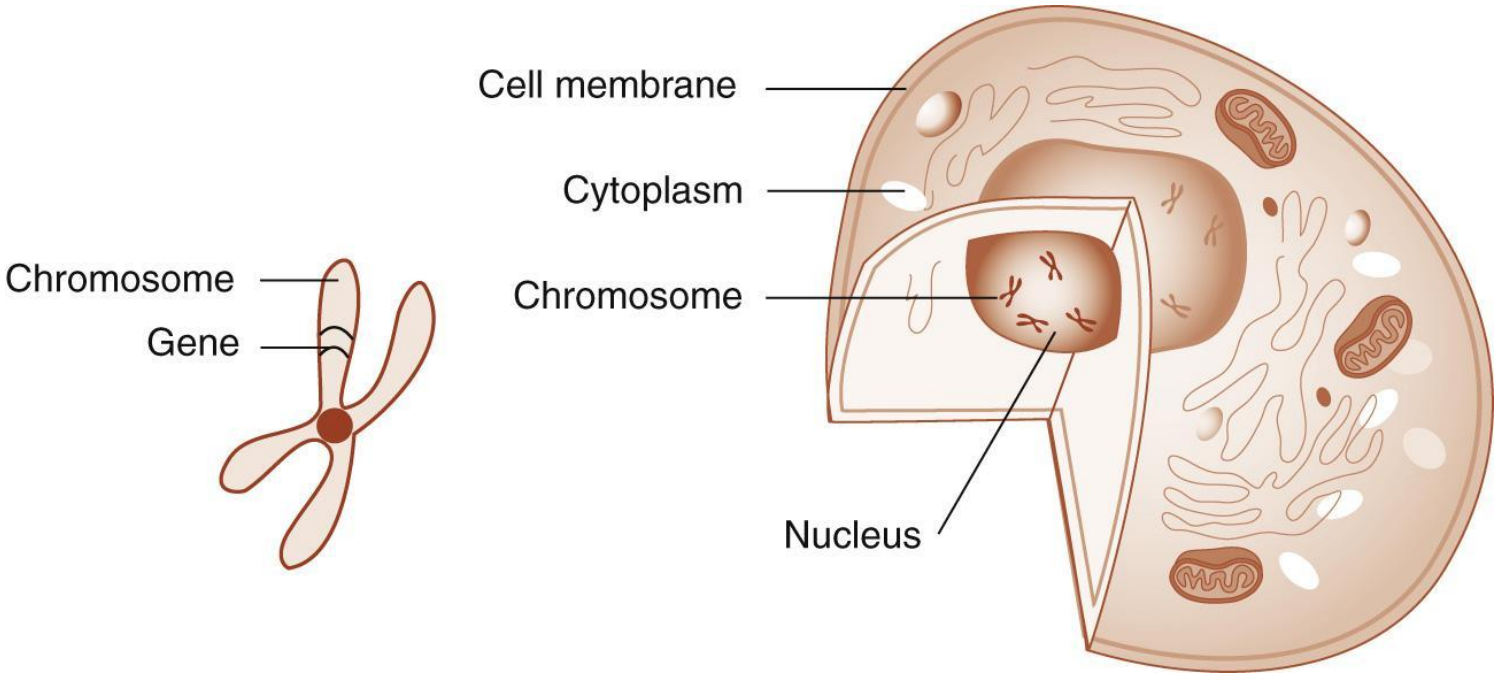
Cytoplasm (egg white): main body of cell

- Contains various organelles
- Specialized structures that carry out activities necessary for cell's survival

Nucleus (egg yolk): control center of cell

- Plays an important role in reproduction
- Chromosomes located in the nucleus contain genes that determine hereditary characteristics.

PARTS OF A BODY CELL



BODY TISSUES

Made up of a group of similar cells that work together to perform particular functions

Types:

- Epithelial: form a protective covering (skin) or line body cavities
- Connective: connect and hold tissues together, transport substances, and protect against foreign invaders
- Muscle: make up the muscles of the body – contract and relax to produce movement
- Nerve: form parts of the nervous system – contract and relax to produce movement

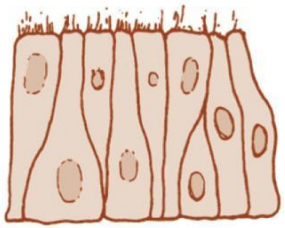
TYPES OF TISSUES

Nerve

CF: neur/o

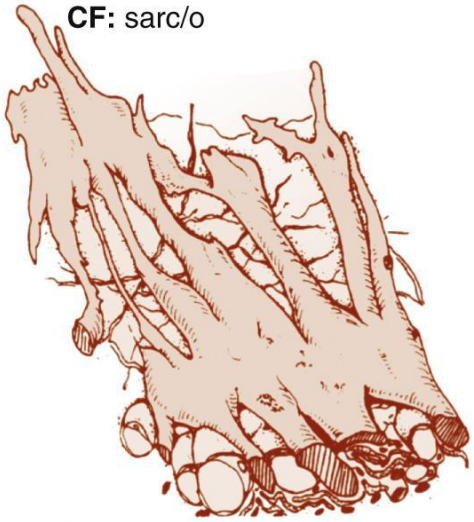
Epithelium

CF: epitheli/o



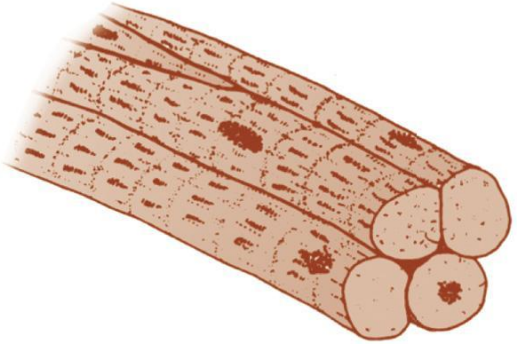
Connective

CF: sarc/o



Muscle

CF: my/o



BODY ORGANS

- Made up of two or more types of tissues that perform one or more common functions
- The stomach is an organ that is made up of muscle, nerve, connective, and epithelial tissue.

BODY SYSTEMS

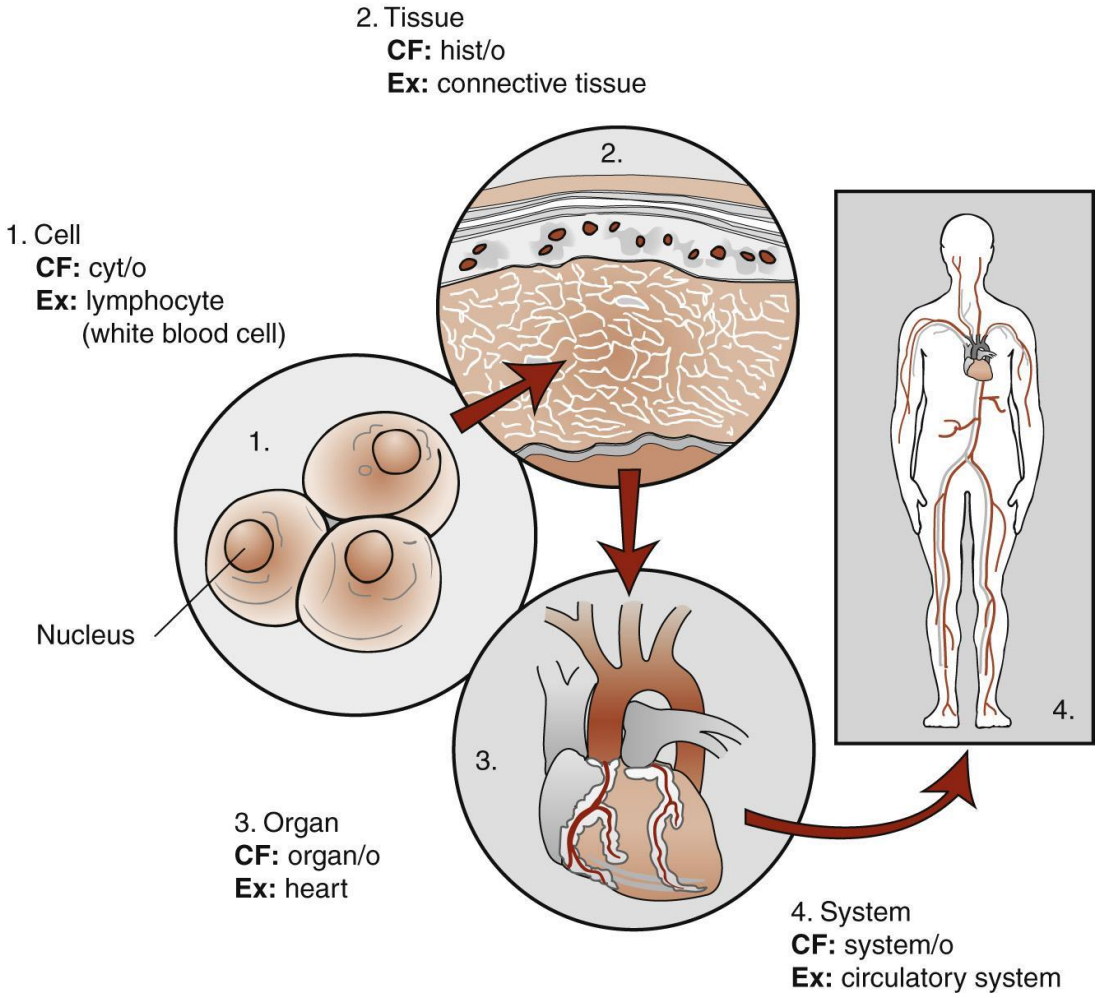
Made up of a group of organs that work closely together in a common purpose to perform complex body functions

Body systems include:

- Urinary, digestive, musculoskeletal, nervous, reproductive, endocrine, circulatory, respiratory, sensory, and integumentary systems

Some organs are a part of more than one system.

ORGANIZATION OF THE BODY



BODY CAVITIES

Dorsal cavity is composed of the cranial cavity and the spinal cavity, which form a continuous space.

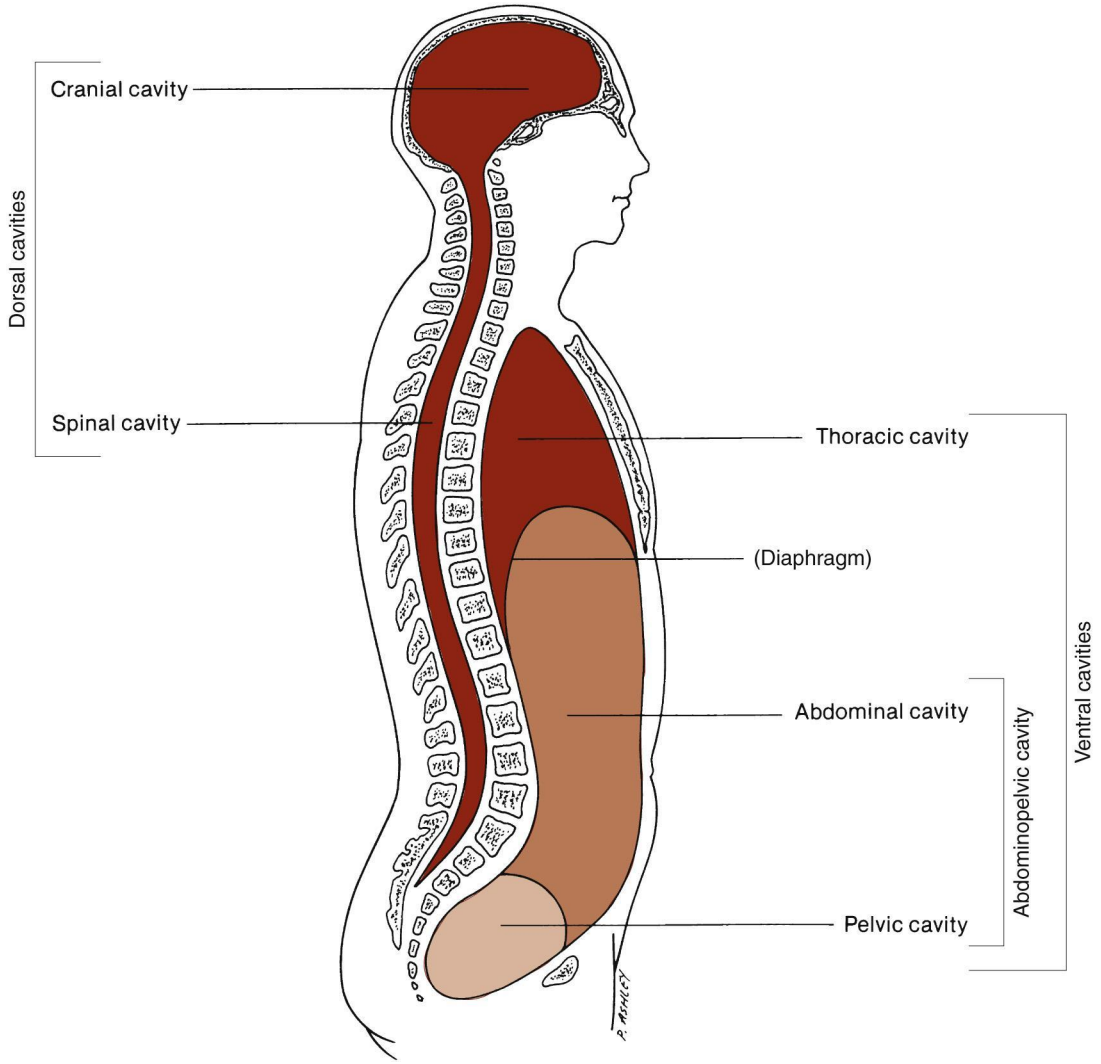
- Cranial cavity: contains the brain
- Spinal cavity: contains the spinal cord

BODY CAVITIES, CONT'D

Ventral cavity is composed of the thoracic (or chest) cavity and the abdominopelvic cavity.

- Thoracic cavity: contains the heart, lungs, trachea, esophagus, thymus gland, and major blood vessels
- Abdominal cavity: contains the stomach, most of the intestines, and the kidneys, ureters, liver, pancreas, gallbladder, and spleen
- Pelvic cavity: contains the bladder, urethra, reproductive organs, part of the large intestine (sigmoid colon), and the rectum

THE BODY CAVITIES



ABDOMINOPELVIC QUADRANTS

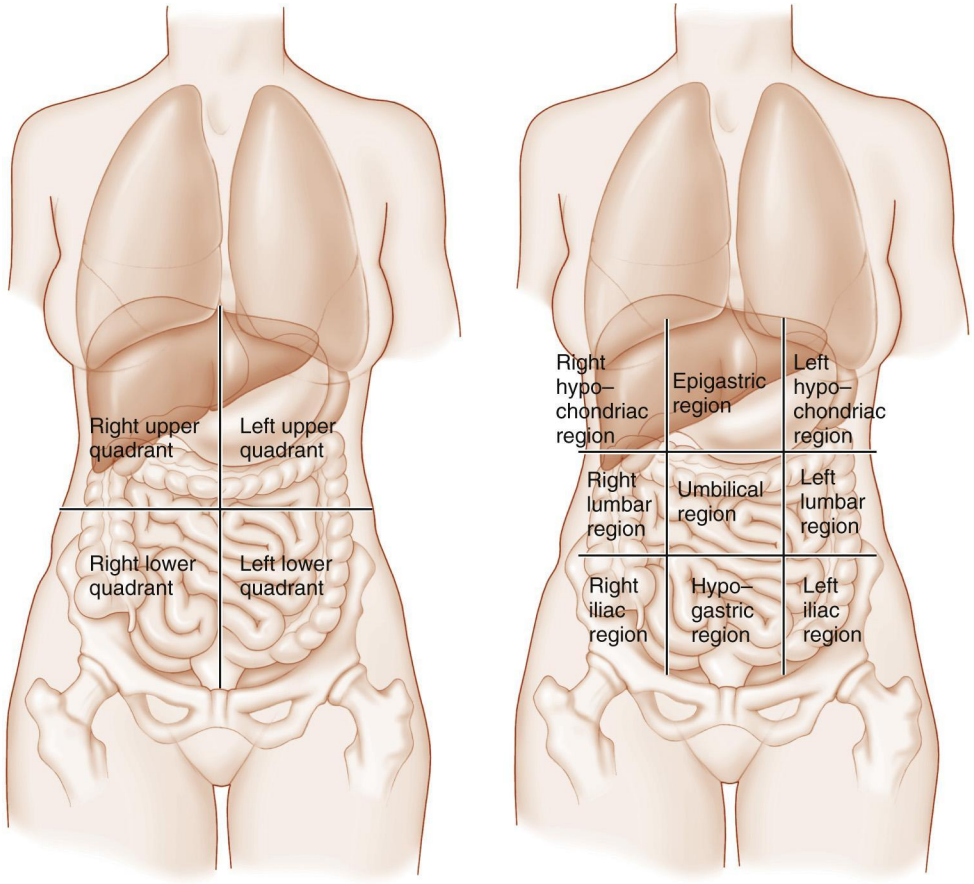
The abdominopelvic cavity is divided into four quadrants and nine regions:

- upper right quadrant (URQ)
- lower right quadrant (LRQ)
- upper left quadrant (ULQ)
- lower left quadrant (LLQ)

ABDOMINOPELVIC REGIONS: NINE REGIONS

- Right hypochondriac region
- Epigastric region
- Left hypochondriac region
- Right lumbar region
- Umbilical region
- Left lumbar region
- Right iliac region
- Hypogastric region
- Left iliac region

ABDOMINOPELVIC CAVITY: FOUR QUADRANTS / NINE REGIONS



ANATOMICAL POSITION

Directional terms, which are used to describe a location on or within the body, refer to the patient in the anatomical position.

The point of reference that ensures proper description:

- body erect
- face and feet forward
- arms at side
- palms facing forward

BODY DIRECTIONAL TERMS

Superior (cranial): Pertaining to above

Inferior (caudal): Pertaining to below

Anterior (ventral): Pertaining to in front of

Anteroposterior (AP): Pertaining to front to back

Posterior (dorsal): Pertaining to in back of

Posteroanterior (PA): Pertaining to back to front

Lateral (lat): Pertaining to the side

Bilateral (bilat): Pertaining to two (both) sides

Medial: Pertaining to the middle

BODY DIRECTIONAL TERMS, CONT'D

Abduction: Pertaining to away from

Adduction: Pertaining to toward

Proximal: Pertaining to closer than another structure to the point of attachment

Distal: Pertaining to farther than another structure from the point of attachment

Superficial: Toward the surface

Deep: Farther from the surface

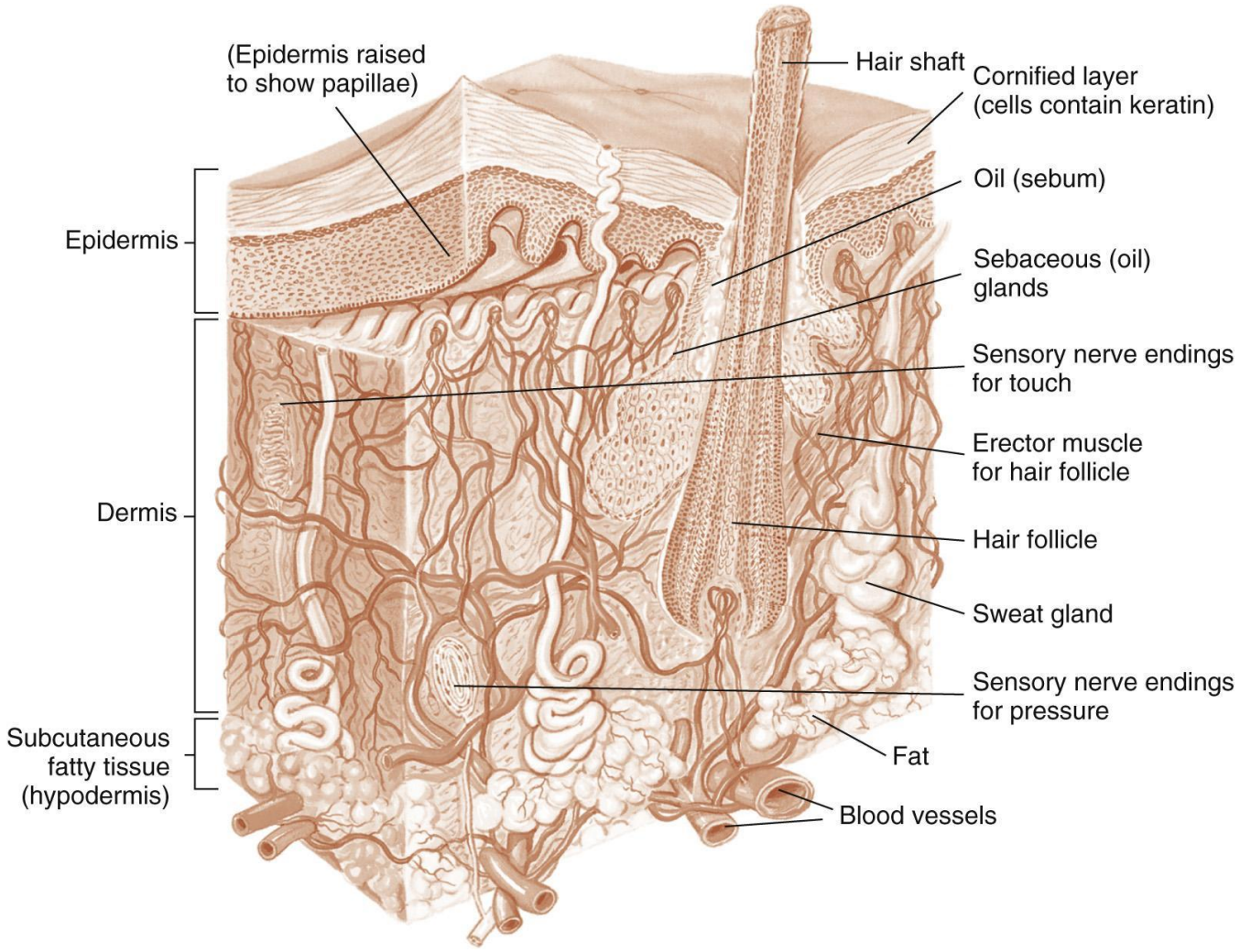
Prone: Lying with the face downward

Supine: Lying on the back

FUNCTIONS OF SKIN

- Protects underlying tissues from pathogenic (disease-causing) microorganisms and other environmental hazards
- Regulates body temperature
- Regulates synthesis of vitamin D
- Sensory – specialized receptors of the skin pass messages of pain, temperature, pressure, and touch to the brain.

THE SKIN


(Epidermis raised to show papillae)
Hair shaft
Cornified layer (cells contain keratin)
Oil (sebum)
Epidermis
Sebaceous (oil) glands
Sensory nerve endings for touch
Erector muscle for hair follicle
Dermis
Hair follicle
Sweat gland
Sensory nerve endings for pressure
Subcutaneous fatty tissue (hypodermis)
Fat
Blood vessels

CANCER'S SEVEN WARNING SIGNALS

Change in bowel or bladder habits

A sore that does not heal

Unusual bleeding or discharge

Thickening or lump in the breast, testes, or elsewhere

Indigestion or difficulty in swallowing

Obvious change in a wart or mole

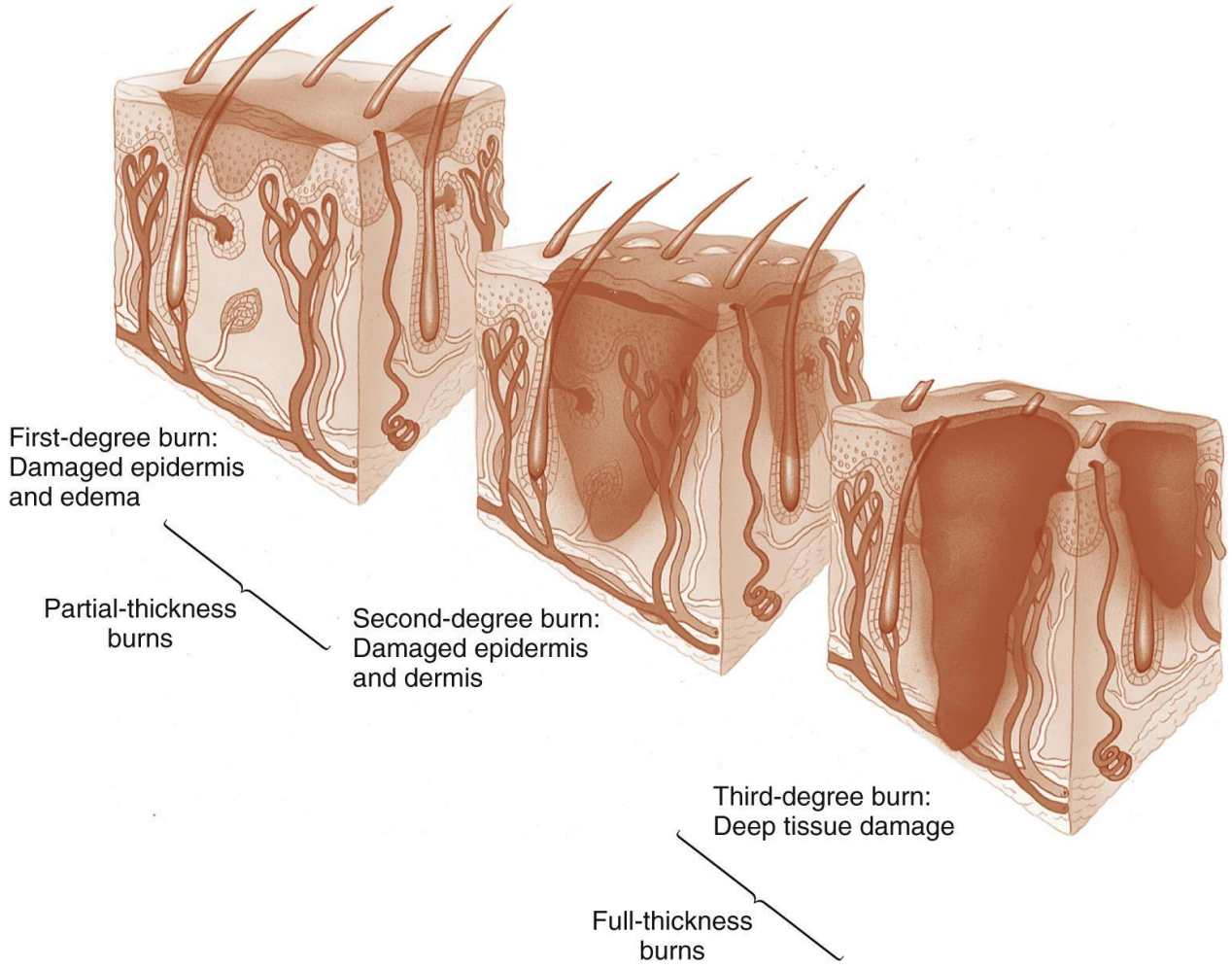
Nagging cough or hoarseness

BURNS

Burns are classified according to degree of severity, which reflects the depth of the burn (full or partial thickness) and the extent of surface area involvement:

- First-degree burns: damage the epidermis
- Second-degree burns: damage the epidermis and the dermis
- Third-degree burns: destroy the epidermis, dermis, and subcutaneous tissue

ILLUSTRATION OF BURNS



ABSCESSES

A cavity that contains pus

Usually caused by pathogenic microorganisms that invade the tissue through a break in the skin

- As microorganisms destroy the tissue, an increased blood supply is rushed to the area, causing inflammation in the surrounding tissue.

Formed by the body to wall off the pathogenic microorganisms and keep them from spreading throughout the body

LACERATIONS AND ABRASIONS

Laceration: a wound that is produced by tearing of body tissue

Abrasion: a scraping away of the skin

Keeping lacerations and abrasions clean is important because of the danger of infection.

GANGRENE

The death of body tissue caused by lack of blood supply to an area of the body; often, it is the result of infection or injury.

Symptoms:

- Fever, pain, darkening of the skin, and an unpleasant odor

Treatment:

- Surgical debridement (removal with a sharp instrument) of necrotic tissue or amputation
- Administration of intravenous (IV) antibiotics
- Use of hyperbaric oxygen therapy to help kill the bacteria

INFECTION

The invasion of the body by pathogenic microorganisms that reproduce and multiply, causing disease

Infections may be caused by streptococcal, staphylococcal, or Pseudomonas bacteria; by viruses; or by other organisms.

Bacterial infections are treated with antibiotic therapy.

DECUBITUS ULCER (BEDSORE OR PRESSURE SORE)

A vascular condition that arises in patients who sit or lie in one position for long periods of time

The weight of the body, typically over bony projections such as the hips, heels, and ankles, slows blood flow, causing ulcers to form, and infection may develop when microorganisms enter the affected area.

Categorized according to severity in terms of stages (stage I to stage IV)

UNIT 2 ABBREVIATIONS

AP anteroposterior

Ca cancer

Lat lateral

LLQ left lower quadrant

LUQ left upper quadrant

PA posteroanterior

RLQ right lower quadrant

RUQ right upper quadrant

Sq subcutaneous

Lesson 22.3

UNIT 3: THE MUSCULOSKELETAL SYSTEM

1. Describe five functions of the skeletal system.
2. List four types of bones and describe bone structure.
3. Name, specify numbers, and spell correctly the bones of the body.
4. Briefly describe 80 bones contained in the axial skeleton and 126 bones contained in the appendicular skeleton.
5. Explain the functions of joints and ligaments.
6. Describe the four main functions of the muscular system.

Lesson 22.3

UNIT 3: THE MUSCULOSKELETAL SYSTEM (CONT'D)

7. Identify and discuss three types of muscles and describe the function of tendons relating to skeletal muscle.
8. Discuss arthritis, a ruptured disk, osteoporosis, and Paget disease.
9. List six types of fractures and describe the purpose and process of joint replacements.
10. Read the objectives related to medical terminology and demonstrate ability to meet the objectives by correctly completing Exercises 1 through 13.
11. Define the unit abbreviations.

FUNCTIONS OF THE SKELETAL SYSTEM

Protection: protects the internal organs from injury

Support: provides a framework for the body

Movement: acts with the muscles to produce body movement

Blood cell production: produces blood cells (hematopoiesis) in the red marrow of certain bones

Mineral storage: stores calcium and phosphorus

TYPES AND STRUCTURE OF BONES

Types: long, short, flat, and irregular

Have their own system of blood vessels and nerves

Contain *red bone marrow* (produces red blood cells, white blood cells, and platelets) and *yellow bone marrow* (consists mostly of adipose tissue, or fat).

Covered with a thin membrane called periosteum

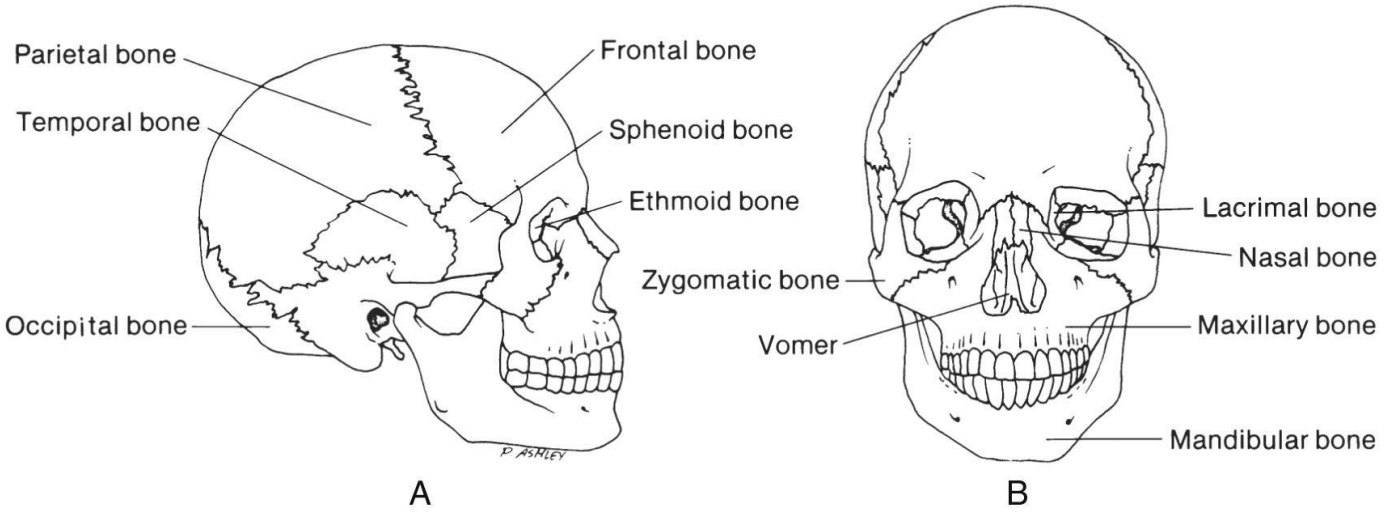
AXIAL AND APPENDICULAR BONES

Axial Skeleton (80 bones): consists of skull, hyoid bone, vertebral column, and rib cage

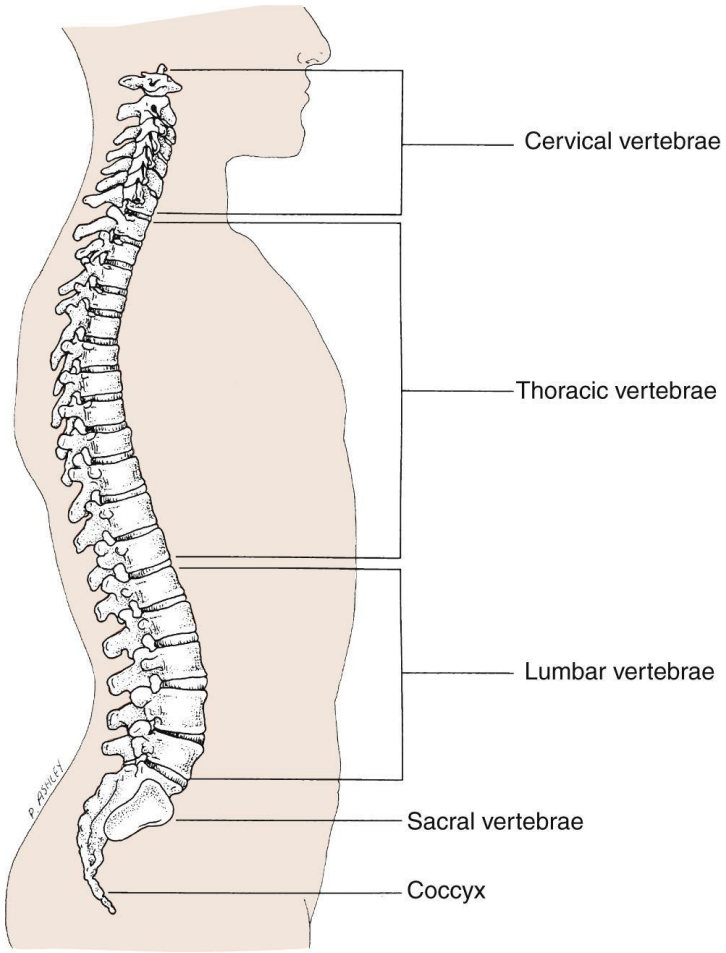
Appendicular Skeleton (126 bones): consists of the limbs that have been appended to the axial skeleton

- upper extremities, clavicle & scapula (64 bones)
- lower extremities, pelvic or hip bones (62 bones)

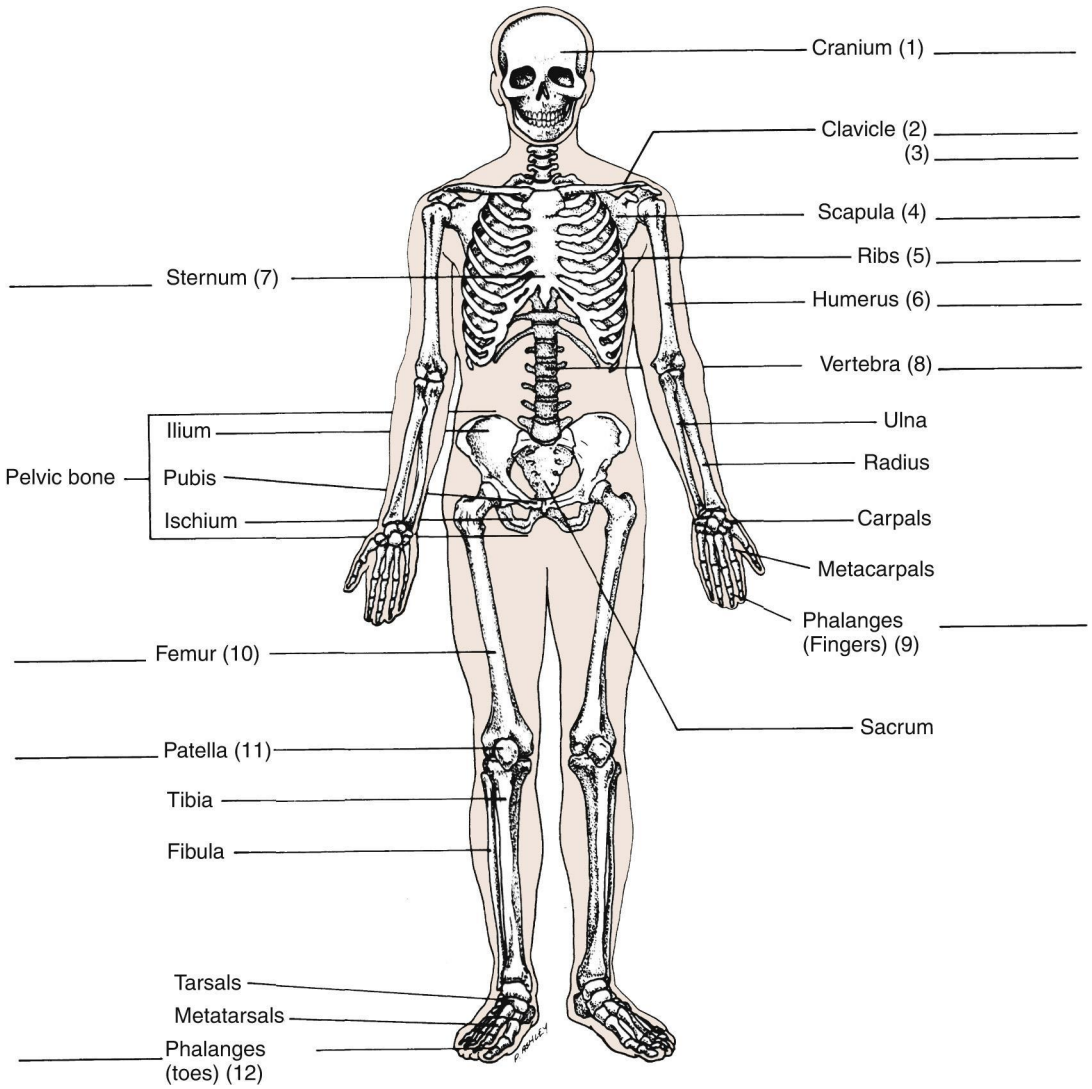
BONES OF THE SKULL, CRANIUM AND FACE



THE VERTEBRAL COLUMN



SKELETAL BONES



JOINTS AND LIGAMENTS

Joint: that place in the skeleton where two or more bones meet – allow for movement and hold bones together

Immovable joints: found only in the skull – called sutures

Ligaments: tough bands of tissue that connect one bone with another bone at a joint

FUNCTIONS OF THE MUSCULAR SYSTEM

Enable movement of body parts (including blood through blood vessels, food through the digestive system, and glandular secretions through ducts)

Maintain posture

Stabilize joints

Generate heat

TYPES OF MUSCLES

Skeletal muscles: voluntary muscles as they are controlled by the conscious portion of the brain and enable the body to move

Smooth muscles: involuntary muscles (not under the control of the conscious part of the brain), generally make up the walls of hollow organs and serve to propel substances through body passageways

Cardiac muscle: involuntary muscle

- Does respond to impulses from the autonomic nerves

RHEUMATOID ARTHRITIS

Usually occurs between the ages of 35 and 50 years and more common in women

Onset of symptoms includes malaise, fever, weight loss, and stiffness of the joints.

Is gradual and symptoms come and go

If chronic, degeneration of the joints, with permanent damage, occurs.

- Treatment: heat and drugs such as aspirin, nonsteroidal anti-inflammatory drugs, and corticosteroids to reduce inflammation and pain

OSTEOARTHRITIS

Most common form of arthritis

Usually occurs in weight-bearing joints, such as the hips or knees, as chronic inflammation of the bone and joints caused by degenerative changes in the cartilage covering the surfaces of the joints

- Treatment: drugs to reduce pain and inflammation and physical therapy to loosen the impaired joints

RUPTURED DISK

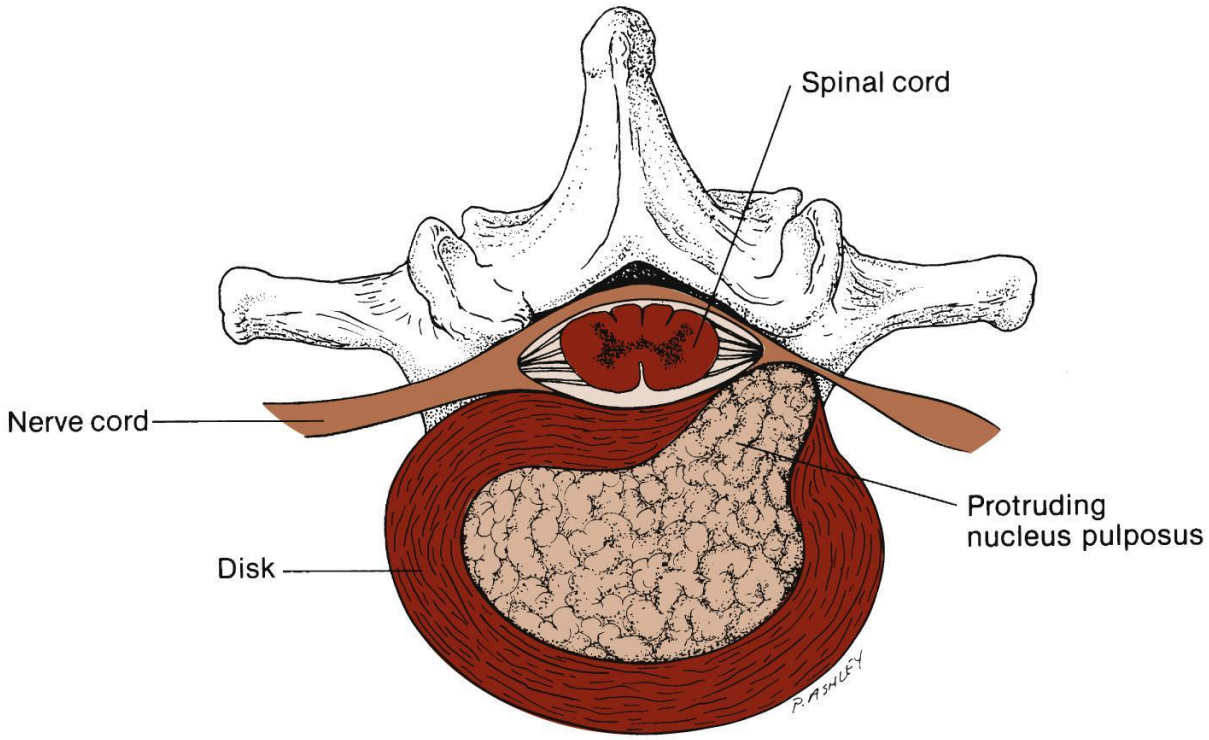
Also referred to as Slipped or Herniated Disk or Herniated Nucleus Pulposus (HNP)

The abnormal protrusion of the soft, gelatinous core of an intervertebral disk (nucleus pulposus) into the neural canal that causes pressure on the spinal cord

Generally occurs in the lumbar spine (lower back)

- Treatment: bed rest, physical therapy, and analgesics

RUPTURED DISK, CONT'D



OSTEOPOROSIS

An abnormal decrease in bone mass; is the leading cause of fractures because the bone tissue becomes porous, thin, and brittle

Most prevalent bone disease in the world – more than 20 million people in the United States have osteoporosis.

Symptoms include pain and loss of height due to the bent-over position that the person assumes.

- Treatment: bisphosphonates and calcitonin;, drugs slow down the dissolving process of the osteoclasts.

PAGET DISEASE

Causes bones to become extremely weak

Affects people generally older than 40 years of age

Bones may fracture with a very slight blow.

If the vertebrae are involved, they may collapse.

Imbalance of dissolving and rebuilding process results in weak areas or lesions of the bone.

Diagnosis is confirmed by abnormal radiologic studies.

- Treatment: bisphosphonate or calcitonin to slow down the dissolving process of the osteoclasts

TYPES OF FRACTURES

Closed (simple): broken bone with no open wound

Open (compound): broken bone with an open wound in the skin

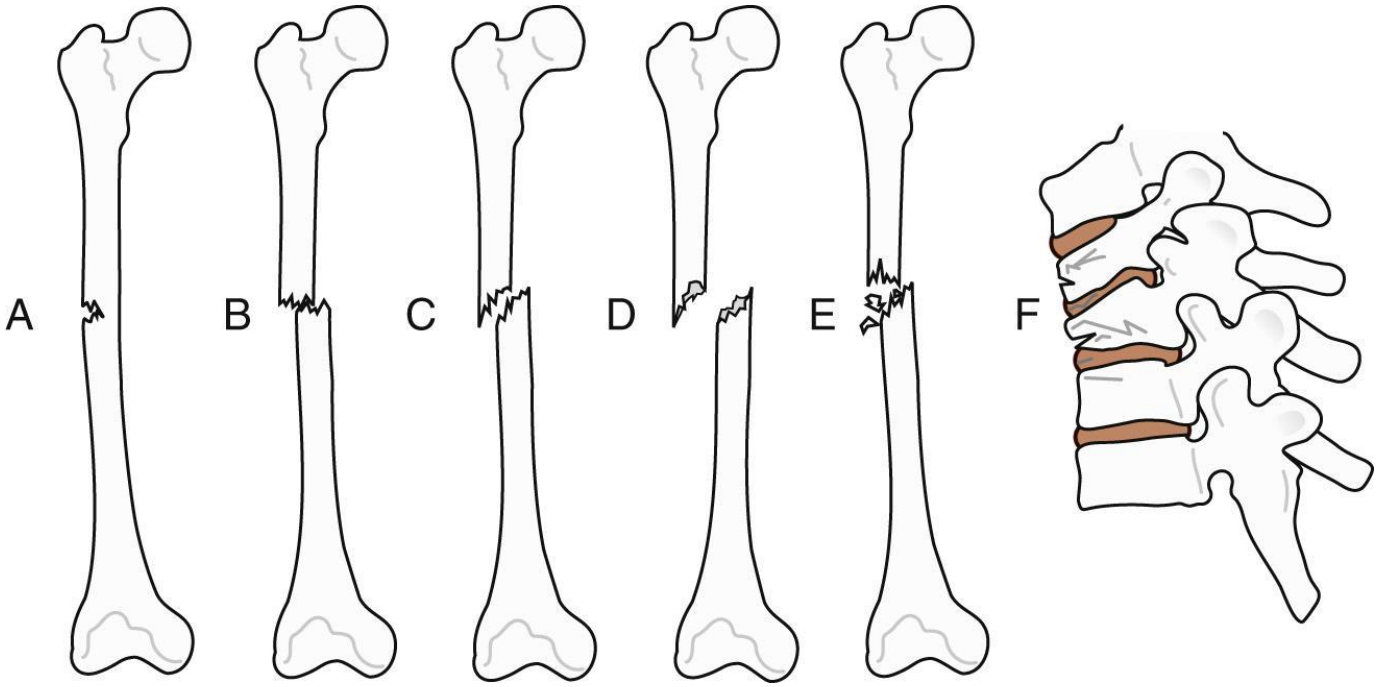
Greenstick (incomplete): partially bent and partially broken bone

Comminuted: splintered or crushed bone

Spiral: bone that has been twisted apart

Compression: occurs when the vertebrae collapse through trauma or pathology

TYPES OF FRACTURES, CONT'D



JOINT REPLACEMENT (ARTHROPLASTY)

Performed to replace an arthritic or damaged joint

An artificial joint, or prosthesis, is used to replace the patient's hip or knee joint.

Total or partial arthroplasty, hip and knee joints and, less commonly, ankle, elbow, shoulder, wrist, and finger joints are replaced in cases of advanced osteoarthritis and improperly healed fracture, or to relieve a chronically painful or stiff joint.

UNIT 3 ABBREVIATIONS

AKA	above the knee amputation
BKA	below the knee amputation
EMG	electromyogram
Fx	fracture
HNP	herniated nucleus pulposus
NSAID	nonsteroidal anti-inflammatory drugs
ORIF	open reduction, internal fixation
THA	total hip arthroplasty
THR	total hip replacement