Activity and Exercise

Chapter 44

Activity and Exercise

refers to the persons rotten of exercise, activity , leisure, and recreation

Include: 1. Activity of daily living

2. The type, quality, and quantity Of exercise

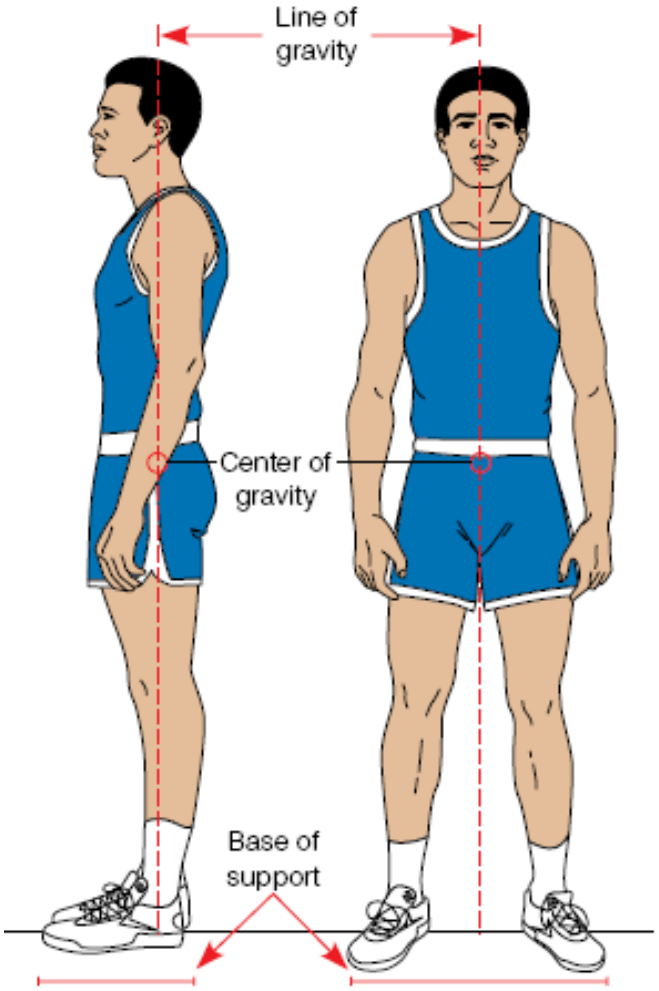
- ***Mobility*** the ability to move freely, easily, rhythmaticly and purposefully in the environment.

Normal movement and stability are the result of

- An intact musculoskeletal system.
- An intact nervous system.
- An intact inner ear structure responsible for equilibrium.

Four Basic Elements of Normal Movement

- Body alignment (posture)
- Joint mobility
- Balance
- Coordinated movement



Body Alignment/Posture

- Brings body parts into position that promotes optimal balance and body function
- Person maintains balance as long as line of gravity passes through center of gravity and base of support

Joint Mobility

- ROM is maximum movement possible for joint
- ROM varies and determined by:
  - Genetic makeup
  - Developmental patterns
  - Presence or absence of disease
  - Physical activity

Balance

- Smooth, purposeful movement
- Result of proper functioning of:
  - Cerebral cortex
    - Initiates voluntary movement
  - Cerebellum
    - Coordinates motor activity
  - Basal ganglia
    - Maintains posture

Coordinated Movement

- Complex mechanisms
- Proprioception
  - Awareness of posture, movement, changes in equilibrium
  - Knowledge of position, weight, resistance of objects in relation to body

- Physical activity: body movement produced by musculoskeletal that required energy and produce health benefits.

- Exercise: type of physical activity defined by planned, structured and repetitive body movement done to improve or maintain body movement.

- Activity tolerance: type and amount of exercise individual is able to perform without experiencing adverse effect.

Type of exercise

- isotonic(dynamic exercise).
- Isometric (state or setting) exercise.
- isokinatic exercise muscle contraction against resistance.

Isotonic (Dynamic) Exercise

- Muscle shortens to produce muscle contraction and active movement
- Increase muscle tone, mass, and strength
- Maintain joint flexibility and circulation
- HR and CO quicken increase
- running, walking, swimming, activity of daily living , range of motion.

Isometric (Static or Setting) Exercise

- Muscle contraction without moving the joint (muscle length does not change)
- Involve exerting pressure against a solid object
- Produce a mild increase in HR and CO
- No apparent increase in blood flow to other parts of the body

Isokinetic (Resistive) Exercise

- Muscle contraction or tension against resistance
- Can either be isotonic or isometric
- Person moves (isotonic) or tenses (isometric) against resistance
- An increase in blood pressure and blood flow to muscles occurs

Exercise according to the source of energy

- Aerobic.
- Anaerobic.

Aerobic Exercise

- Activity during which the amount of oxygen taken in the body is greater than that used to perform the activity
- Improve cardiovascular conditioning and physical fitness
- use large muscle group
- Performed continually e.g walking, dancing ….

Anaerobic Exercise

- Activity in which the muscles cannot draw enough oxygen from the bloodstream
- Anaerobic pathways are used to provide additional energy for a short time

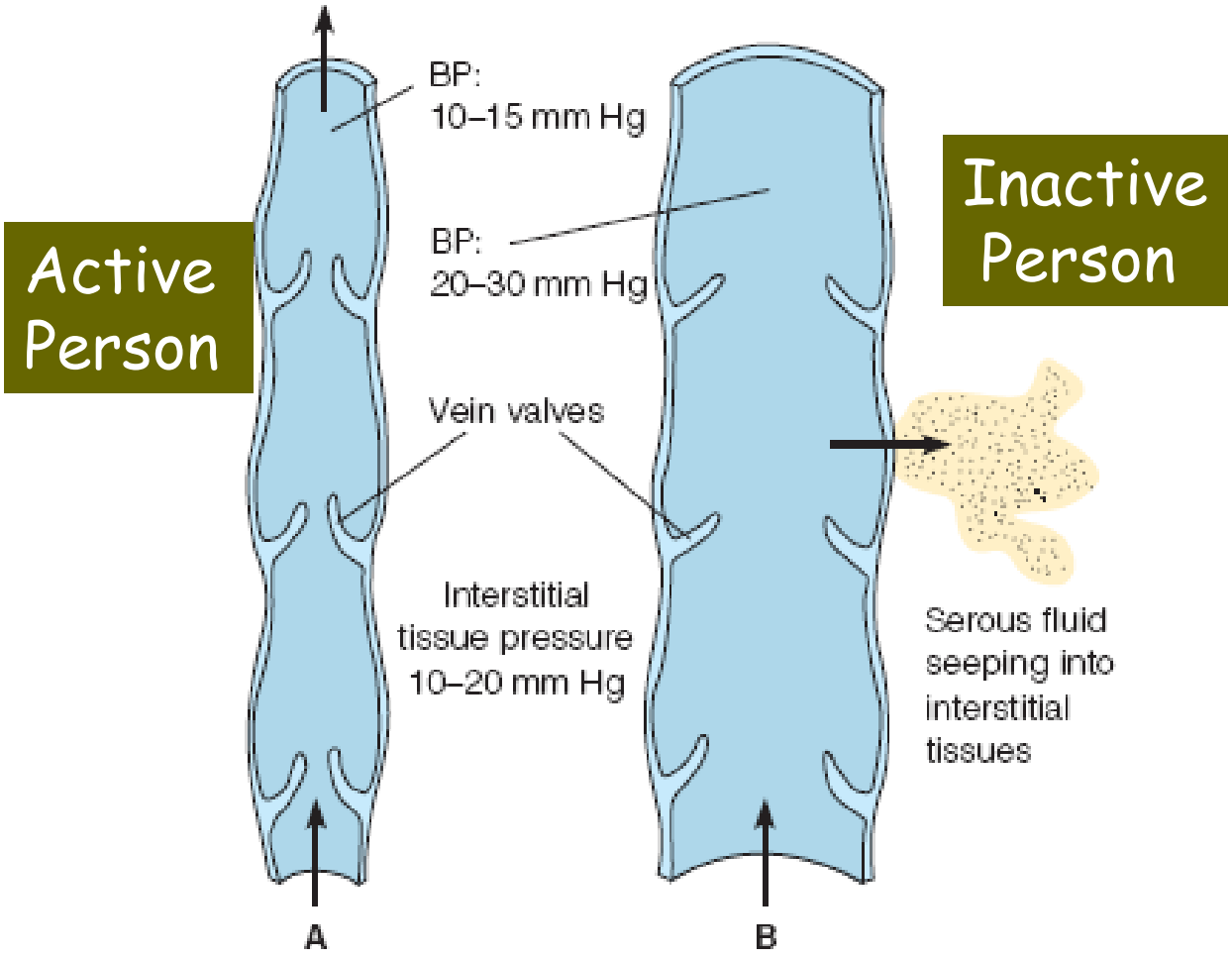
Effect on Musculoskeletal System

- Exercise
  - Maintain size, shape, tone, and strength of muscles (including the heart muscle)
  - Nourish joints
  - Increase joint flexibility, stability, and ROM
  - Maintain bone density and strength
- Immobility
  - Disuse osteoporosis
  - Disuse atrophy
  - Contractures
  - Stiffness and pain in the joints

Effects on the Cardiovascular System

- Exercise
  - Increases HR, strength of contraction, and blood supply to the heart and muscles
  - Mediates harmful effects of stress
- Immobility
  - Diminished cardiac reserve
  - Increased use of the Valsalva maneuver
  - Orthostatic hypotension
  - Venous vasodilation and stasis
  - Dependent edema
  - Thrombus formation

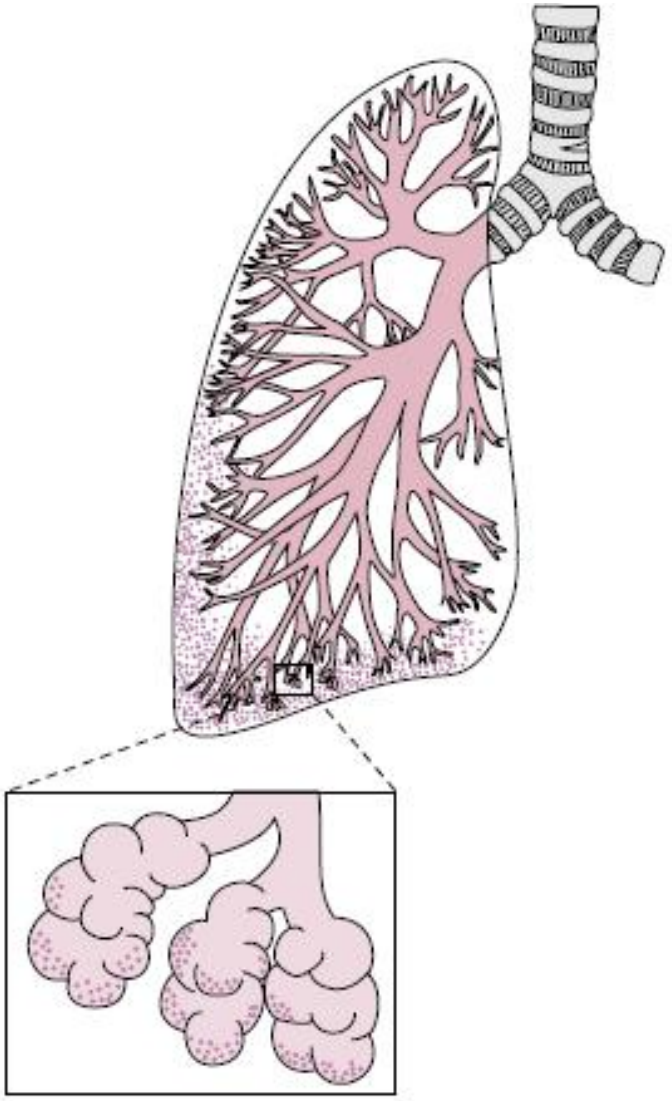
Leg Veins


Active Person
Inactive Person
BP:
10–15 mm Hg
BP:
20–30 mm Hg
Vein valves
Interstitial
tissue pressure
10–20 mm Hg
Serous fluid
seeping into
interstitial
tissues
A
B

Effect on the Respiratory System

- Exercise
  - Increase ventilation and oxygen intake improving gas exchange
  - Prevents pooling of secretions in the bronchi and bronchioles
- Immobility
  - Decreased respiratory movement
  - Pooling of respiratory secretions
  - Atelectasis
  - Hypostatic pneumonia

Pooling of Secretions: Immobile Person



Effects on the Metabolic/Endocrine System

- Exercise
  - Elevates the metabolic rate
  - Decreases serum triglycerides and cholesterol
  - Stabilizes blood sugar and make cells more responsive to insulin
- Immobility
  - Decreased metabolic rate
  - Negative nitrogen balance
  - Anorexia
  - Negative calcium balance

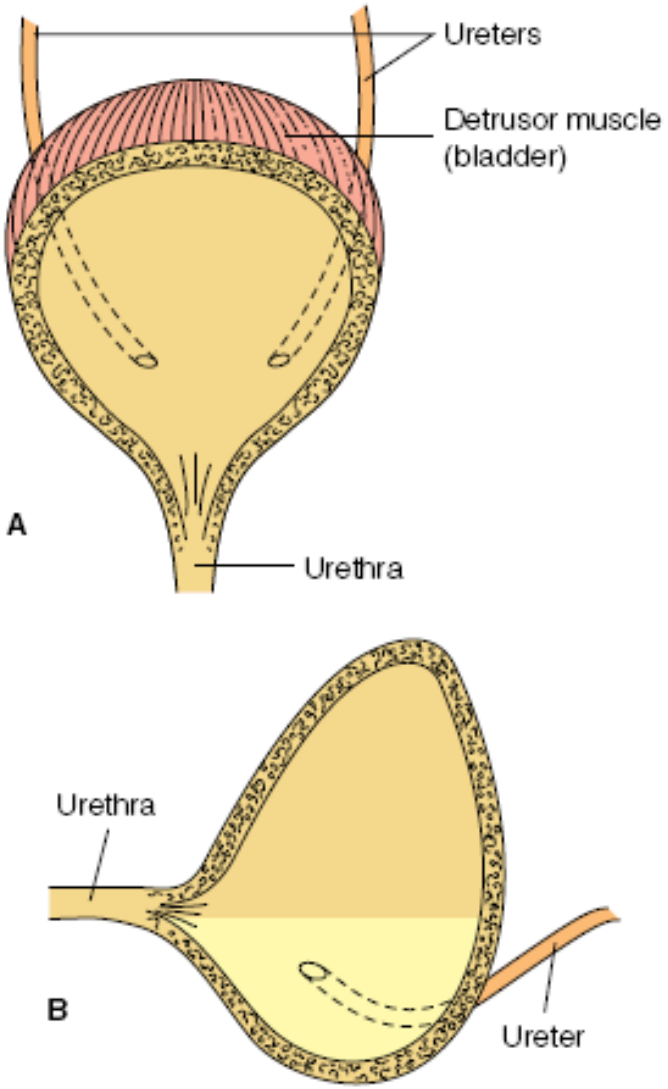
Effects on the GI System

- Exercise
  - Improves the appetite
  - Increases GI tract tone
  - Facilitates peristalsis
- Immobility
  - Constipation

Effect on the Urinary System

- Exercise
  - Promotes blood flow to the kidneys causing body wastes to be excreted more effectively
  - Prevents stasis (stagnation) of urine in the bladder
- Immobility
  - Urinary stasis
  - Renal calculi
  - Urinary retention
  - Urinary infection

Pooling of Urine



Effect on the Immune System

- Exercise
  - Pumps lymph fluid from tissues into lymph capillaries and vessels
  - Increases circulation through lymph nodes
  - Strenuous exercise may reduce immune function
    - Leaving window of opportunity for infection during recovery phase

Effect on the Psychoneurologic System

- Exercise
  - Elevates mood
  - Relieves stress and anxiety
  - Improves quality of sleep for most individuals
- Immobility
  - Decline in mood elevating substances
  - Perception of time intervals deteriorates
  - Problem-solving and decision-making abilities may deteriorate
  - Loss of control over events can cause anxiety

Effect on Cognitive Function

- Exercise
  - Positive effects on decision-making and problem solving processes, planning, and paying attention
  - Induces cells in the brain to strengthen and build neuronal connections

Other Effects of Exercise and Immobility

- Evidence that certain types of exercise increase spiritual health
- Immobility causes reduced skin turgor and skin breakdown

Factors Affecting Body Alignment, Mobility, and DAL

- Growth and development
- Nutrition, personal values and attitudes
- External factors
  - i.e., Temperature, humidity, availability of recreational facilities, safety of the neighborhood
- Prescribed limitations
  - i.e., Casts, braces, traction, activity restrictions including bed rest

Assessment of Activity and Exercise

- Nursing History
- Physical Examination:
  - Body alignment
  - Gait
  - Appearance and movement of joints
  - Capabilities and limitations for movement
  - Muscle mass and strength
  - Activity tolerance
  - Problems related to immobility

NANDA Nursing Diagnoses

- For activity and exercise problems
  - *Activity Intolerance*
  - *Risk for Activity Intolerance*
  - *Impaired Physical Mobility*
  - *Sedentary Lifestyle*
  - *Risk for Disuse Syndrome*

NANDA Nursing Diagnoses

- The mobility problem becomes the etiology:
  - *Fear (of falling)*
  - *Ineffective Coping*
  - *Low Self-Esteem*
  - *Powerlessness*
  - *Risk for Falls*
  - *Self-Care Deficit*

NANDA Nursing Diagnoses

- Prolonged immobility:
  - *Ineffective Airway Clearance*
  - *Risk for Infection*
  - *Risk for Injury*
  - *Risk for Disturbed Sleep Pattern*
  - *Risk for Situational Low Self-Esteem*

Examples of Desired Outcomes (NOC Labels)

- Activity tolerance
- Body positioning
- Bowel elimination
- Fall prevention behavior
- Immobility consequences both physiological and psychocognitive
- Joint movement
- Mobility
- Respiratory status
- Ventilation and gas exchange
- Self-care
- Sleep
- Stress level
- Weight control

Overall Goals for Problems Related to Mobility or Activity

- Increased tolerance for physical activity
- Restored or improved capability to ambulate and/or participate in ADLs
- Absence of injury from falling or improper use of body mechanics
- Enhanced physical fitness
- Absence of any complications associated with immobility
- Improved social, emotional, and intellectual well-being

Safe Practice for Positioning, Moving, Lifting, Ambulating Clients

- Correct body mechanics required for nurse to prevent injury
- Correct body alignment for the client also so that undue stress is not placed on the musculoskeletal system

General Guidelines for Moving and Lifting

- Before moving, assess
- If indicated, use pain relief modalities
- Prepare any needed assistive devices
- Plan around encumbrances
- Be alert to the effects of any medications
- Obtain required assistance
- Explain the procedure to the client

General Guidelines for Transferring a Client

- Plan what to do and how to do it
- Obtain essential equipment before starting
- Remove obstacles
- Explain transfer to client and assistive personnel
- Support or hold client rather than equipment
- Explain what client should do
- Make written plan, including client's tolerance

General Guidelines for Ambulating

- Assess the amount of assistance the client will require
- Assess for signs and symptoms of orthostatic hypotension
- Prepare client for ambulation
- Apply transfer or walking belt
- Physically support client
- Obtain assistance to follow with wheelchair or assist with physical support
- Teach client to correctly use mechanical aids

Questions?