HAZARDS OF IMMOBILITY

- Effects are systemic and functional
- Can be gradual or immediate
- No body system is immune
- Amount of impairment depends upon client’s age, overall health and the degree of immobility
- Elderly clients with chronic illnesses develop pronounced effects of immobility more quickly than younger clients

MUSCULOSKELETAL SYSTEM

PRIMARY STRUCTURES

- Skeletal muscles--move bones around joints
- Joints--where bones meet
  - function to provide motion and flexibility
  - composed of ligaments (bind bone together) and cartilage (covers and cushions ends of bones)
- Bones--provide major support--composed of three things
  - osteoblasts deposit the organic matrix
  - osteocytes reabsorb matrix
  - osteoclasts reabsorb matrix

*** if 8 stress is placed on bone as in athletic activity, more bone is deposited
*** if 9 stress or no stress as in prolonged bedrest, bone is reabsorbed
*** Encourage clients to stand and walk as the body functions best in the vertical position
*** Physical activity forces muscles to move and increases blood flow which improves metabolism and facilitates peristalsis
*** When horizontal the abdominal organs press on the diaphragm and inhibit its movement which decreases respiratory efficiency

Osteoporosis
Ankylosis
Spondylosis

EFFECTS OF IMMOBILITY

- Loss of endurance
  - X Caused by changes in the muscles and altered cardiovascular functioning
  - X increased cardiac workload causes decreased muscle endurance because there is a reduction in the ability of the cardiorespiratory system to meet the O$_2$ needs of the tissues

- Decreased muscle mass
  - X Due to metabolic changes than cause the loss of lean body mass which is partially muscle
  - X Reduced mass means the body fatigues easily and is unable to sustain activity
  - X Atrophy
  - X Caused by metabolic changes and disuse
  - X Can be observed and measured

- Decreased stability
  - X Results from loss of endurance, decreased muscle mass, atrophy, and joint abnormalities
  - X Clients move unsteadily and the risk for falls increases
  - X Joint contractures results from disuse, atrophy, and shortening of muscle fibers
  - X Disuse osteoporosis results from bone reabsorption which also causes calcium to be released in the blood

ASSESS
1. Muscle tone
2. Muscle mass
3. Contractures?
4. Range of joint motion
5. Check urine and serum for Ca levels

ACTIONS (INTERVENTIONS)
1. ROM
2. Turning
3. Any activity is better than none
4. Preservative Methods exercises and assisted ambulation
5. Restorative Methods Crutch walking
6. Rehabilitative Methods w/c, adaptive devices
SUMMARY

- 9 muscle size, tone and strength
- 9 joint mobility and flexibility
- bone demineralization
- 9 endurance
- 9 stability
- 8 risk of contracture formation

CARDIOVASCULAR SYSTEM

- Increased cardiac workload
  - results from a decrease in vessel resistance and a change in the distribution of the blood
  - 8 workload causes 8 heart rate, 9 cardiac output and 9 stroke volume
  - resting heart rate can increase 4-15 beats per minute
  - as workload 8=s so does the O2 consumption of the heart 8 it works harder and less efficiently

- Orthostatic hypotension
  - there is 9=d circulating blood volume, pooling of blood in the lower extremities, and 9=d autonomic response
  - the above factors result in 9=d venous return followed by 9=d cardiac output which is reflected in a drop in BP

- Thrombus formation
  - 9=d circulating blood volume results in an 8=d hematocrit level which results in 8=d viscosity of the circulating blood
  - bedrest causes venous stasis
  - 8=d Ca levels in the circulating blood also influences the clotting rate

ASSESS

1. BP
2. Apical and peripheral pulses
3. Temperature of extremities as well
4. Check for edema
5. Check for Homan’s sign 8 passively dorsiflex foot and if client c/o pain in an area in the posterior calf, note any erythema, warmth, and/or tenderness
6. Measure circumference of calves and thighs

ACTIONS (INTERVENTIONS)

1. Get client out of bed ASAP
2. Dangle at bedside first
3. Discourage Valsalva maneuver
4. Low dose heparin therapy
5. TEDS
6. Intermittent compression stockings
7. ROM

SUMMARY

- 8 Cardiac workload
- 8 Risk of orthostatic hypotension
- 8 Risk of venous thrombosis

RESPIRATORY SYSTEM

- Decreased hemoglobin levels
  - Hypovolemia causes false elevations of hematocrit and hemoglobin
  - In fact, red blood cell mass and hemoglobin decline which results in a reduction in O2 delivery to the tissues

- Reduced lung expansion
  - Immobilization changes the distribution of ventilation and blood flow through the lungs
  - Clients are unable to take a deep breath

- Respiratory muscle weakness
  - Caused by limited physical activity and metabolic changes
  - Results in the increase of the work of breathing which causes a decline the ability of the client to
cough

Stasis of secretions
X The distribution of mucous in the bronchi increases and it accumulates
X With decreased lung expansion and weakened respiratory muscles, secretions stagnate and pool which increases the potential of hypostatic pneumonia

Impaired gas exchange
X 9=di respiratory muscle tone causes 9=di vital capacity and 9=di gas exchange
X Immobility results in incomplete expansion of the lungs with a resulting collapse of alveoli themselves

ASSESS
1. Assess respirations q2h
2. Check movements of chest wall
3. Check capillary refill
4. Observe for any difficulties

ACTIONS (INTERVENTIONS)
1. Change client’s position q2h
2. Encourage C& DB q2h
3. Maintain a patent airway
4. Encourage fluids to keep secretions liquid

SUMMARY

Depth of respiration
Rate of respiration
Pooling of secretions
Impaired gas exchange
Respiratory muscle tone

INTEGUMENTARY SYSTEM
Pressure ulcer formation
X Results when there is external pressure on an area and that same area has a decrease in circulation
X Sheering force
X Moist skin
X Altered metabolism and/or nutrition
X Fever

Risk of skin breakdown
Caused by impaired nutrition, loss of lean body mass, and negative nitrogen balance

ASSESS
1. Check skin for breakdown and/or erythema
2. Observe for sensory loss
3. Check for anemia
4. Monitor protein and albumin levels in the blood
5. Monitor WBC levels and other signs of infection

ACTIONS (INTERVENTIONS)
1. Identify clients at risk for skin breakdown
2. Turn and position at least q2h
3. Keep skin clean and dry
4. Avoid using drying agents such as soaps
5. Use therapeutic mattresses
6. Rx pressure ulcers

SUMMARY

Risk of skin breakdown
Formation of pressure ulcers

URINARY SYSTEM

Urinary stasis
X Urine cannot flow uphill so remains in the renal pelvis
X Renal calculi
X Bone demineralization causes increased Ca levels and stasis of urine
X Fluid intake decreases causing concentration of the urine

Decreased urinary output
X Decreased intake results in less urine but it is more concentrated

Decreased intake causes decreased output also there is stasis in a warm moist environment
X Urine becomes more alkaline
X Decreased bladder tone
X Inability to completely empty bladder due to position
X Causes loss of bladder control

**ASSESS**
1. Intake and output q shift
2. Monitor WBC to assess for infection
3. Monitor VS
4. Assess urine for color, odor, clarity

**SUMMARY**
- Urinary stasis
- Risk of renal calculi
- Risk of urinary tract infection
- Bladder muscle tone
- Urinary output

**GASTROINTESTINAL SYSTEM**
- Disturbance in appetite
- Altered protein metabolism
- Altered digestion and utilization of nutrients
- Peristalsis resulting in constipation, poor defecation reflexes and inability to expel flatus

**ASSESS**
1. Bowel sounds q shift
2. Check bowel movement frequency
3. Check intake and output
4. Check appetite
5. Assess protein levels in the blood

**ACTIONS (INTERVENTIONS)**
1. Record appetite at each meal
2. Record intake each shift and compare to output
3. Include client likes and dislikes
4. Observe for diarrhea

**METABOLIC SYSTEM**
- Risk of fluid and electrolyte imbalances
- Results from bone demineralization, cellular metabolic changes, excessive perspiration, and altered hormone production
- Also impacted by fluid volume shifts

**ACTIONS (INTERVENTIONS)**
1. Daily weights
2. Monitor labs for protein
3. Monitor urine for protein
4. Monitor WBC
5. Check muscle mass and strength

**PSYCHOSOCIAL EFFECTS**— All of these are directly related to inactivity
- Sense of powerlessness
- Risk of depression
- Self-concept
- Social interaction
Sensory stimulation
Altered sleep-wake pattern

ASSESS
1. Assess emotional state at least q shift
2. Observe for behavior changes

ACTIONS (INTERVENTIONS)
1. Attempt to determine cause of behavior changes
2. Report any such changes

DEVELOPMENTAL EFFECTS
1. Progression through developmental tasks
2. Independence