

MEDICAL SURGICAL NURSING

PAIN

- gate control theory
- prostaglandin: universal pain stimulus
- nociception

4 Stages of Nociception

I. Transduction Phase

- prostaglandin excretion
- medication: non-opioids
 - acetaminophen
 - NSAIDs

*Acetaminophen:

1. Call the doctor if the patient experiences GI pain, tinnitus and nephrotoxicity.
2. Give with food.
3. Increase OFI.

II. Transmission Phase

- stimulation of small nerve fibers
- medication: Opioids
 - Simple (Codeine, Nubain)
 - Strong (Demerol, Morphine, Tentanyl)

*Morphine S/E

- M – iosis (x-cataract, /-glaucoma)
- O – rthostatic hypotension
- R – espiratory depression (always on bedside: Narcan and mechanical ventilator)
- P – ruritus
- H – istamine release
- I – ntracranial tension
- N – ausea
- E – uphoria
- S - edation

*Universal S/E of morphine: constipation with antispasmodic effect

*Tentanyl S/E

- respiratory depression
- Always on the bedside: Narcan and mechanical ventilator

III. Perception Phase

- brain interprets it
- opening of Gate Control Theory
- nonpharmacologic intervention

IV. Modulation Phase

- endogenous chemicals are excreted (serotonin, enkephalin)
- medication: adjuvant analgesics
 - SSRI
 - antidepressants

2 Types of Pain

- Acute - lasts for less than 6 months
- all vital signs are increased
- patient is restless, noisy and diaphoretic
- Chronic - lasts for more than 6 months
- vital signs are normal
- patient appears to be withdrawn and silent

Child Assessment for Pain

- F – ace
- L – egs
- A – ctivity
- C – ry
- C – consolidability

- scoring is between 0, 1, and 2 with a total of 10

Level of Pain Management by WHO

Pain Score: 1-3

Management: Non-opioids (acetaminophen, NSAIDs)/Adjuvant

Pain Score: 4-6

Management: Simple opioids + Non-opioids + Adjuvant

Pain Score: 7-10

Management: Strong opioids + Non-opioids + Adjuvant

*PCA can lessen the work of the nurse and since pain is subjective, the patient can decide when to administer the drug.

HEMATOLOGY

erythroblast – “baby” RBC
reticulocytes – immature RBC
erythrocytes – mature RBC and also lasts for 120 days

*Hemoglobin has 6 chains: 4 alpha, 2 beta.

Thalassemia A/B Major

- all four major alpha are absent
- Patient will experience splenomegaly because it is full with destructed RBC
- Patient will experience jaundice since the \ release of hemi is every 40 days so there will be buildup in the blood which increases the secretion of bilirubin.
- Hepatomegaly because the liver is overworking.
- Pruritus due to the build-up of bile.

Interventions:

1. BT of PRBC – can cause iron toxicity (antidote: Deferoxamine)
2. Risk for injury

*Heterozygous type only lacks 2 alpha so the person doesn't have s/sx because he has 2 remaining.

ALL

- common to children (4-7 years old)
- prognosis is good

Polycythemia Vera

- increase of RBC, WBC and platelet
- “ruddy” complexion
- no hepatomegaly for a while

Priorities:

1. Wet phlebotomy (removal of blood)
2. Giving of phosphorus to halt or prevent production of RBC for 3 years (for children only).
3. Increase fluid intake to dilute the blood.

Sickle Cell Disease

- mutation of beta cells
- also called homozygous

Types

A. Vaso-occlusive crisis

- increase oxygen
- patient experiences pain
- common to old people

Management:

- H – ydration
- O – xygen

- P – air management
- E – exposure to high altitude areas should be avoided

2. Splenic Sequestration
- hallmark: priapism and colic pain
 - common to pediatric patients
 - priority: empty the bladder and splenectomy

3. Hemolytic Crisis
- decrease hemoglobin
 - shock

Management:

1. Blood transfusion

4. Aplastic Crisis
- decrease of blood products

Management:

1. Transfusion of whole blood.
2. Antibiotics to avoid pneumonia.
3. NSAIDs for bone pain.
4. Hydroxyurea (anti-cancer) to stimulate production of fetal hemoglobin.

*Clotting Cascade:

Platelet → thromboxane → platelet clot → CF 12 → 11 → 9 → 8 → 10 → PT → T → fibrinogen → fibrin → clot

Hemophilia A

- disease common to male
- females are only carrier
- factor 2 replacement

Hemophilia B

- Tx: cryoprecipitate or frozen plasma
- no clotting factor 9

Hemophilia C

- Tx: frozen plasma
- no CF 10 and 11

Disseminated Intravascular Coagulation

- cause: massive bleeding, shock
- there is massive clotting
- defective clotting problem

Management:

1. Blood transfusion
2. Aim to treat the cause.
3. Give frozen plasma.

G6PD

- glucose-6-phosphate
- The function of G6PD is to clean RBC before erythrocyte is released
- genetic, x-link
- hallmark: jaundice
- triggering factors: acetaminophen, antibiotic, excessive stress and sun exposure
- kernicterus: client turns yellowish which means he has impaired liver

CARDIOVASCULAR SYSTEM

- S1 – “lub”, low pitch
- S2 – “dub”, high pitch
- S3 – ventricular gallop
 - normal in children and patients less than 40 years old
 - may indicate CHF/MAI for patients who are more than 40 years old

- S4 – atrial gallop (“Tennessee”)
 - abnormal finding
 - heard on client with advanced CHF, COPD and CAD

*Hallmark of MI:

1. Myocardial ischemia (ST depression)
2. Myocardial injury (ST elevation)
3. Myocardial infarction (pathologic Q wave)

Angina

- Stable - occurs during activities
- pre infarction
 - 1 nitroglycerine

Unstable – 3 nitroglycerine

- Prinzmetal – cause: vasospasm
- calcium channel blockers

Nitroglycerine – expires after 6 months

- store in dark container
- powderize NTG and place between teeth or under the tongue to maximize effect

Myocardial Infarction

ER Management:

1. HR
2. Chest pain (Morphine-O2-NTG-Aspirin)
3. SOB (O2-Morphine-ECG-NTG)
4. Nsg dx: Acute chest pain r/t decrease in O2 supply, increase demand
5. Thrombolytics (Urokinase) – given within 2 to 4 hours
6. Goal: decrease chest pain and increase O2 supply

ICU Management:

1. Obligation is to give medication.
2. Medications:
 - Thrombolytics (Urokinase)
 - Heparin
 - Sodium channel blocker (Lidocaine)

*Safety level: 72 hours

Ward Management:

1. Goal: Prevent future complication.
2. Third, fourth and fifth day is crucial
3. 3rd day – CBR without toilet privileges
4. 4th day – sitting and dangling of legs 3x per shift
 - stand and walk around the room
5. 5th day – walk on the hallway
6. Oral medications:
 - Aspirin (antiplatelet)
 - NTG
 - Clopidogrel (Plavix)
 - Antithrombotics
7. Diagnostic exams:

a. Cardiac catheterization

- confirmatory diagnostic test
- insertion of catheter with dye inserted on the femoral artery
- to check for blockage

Pretest: Check for allergy.
NPO

Intra: Meds needed (Epinephrine)

Post: Bed rest flat on bed, supine 8-12 hours to prevent bleeding.

b. Swan-Ganz catheterization

- definitive diagnostic test for CHF
- pulmonary-artery catheterization
- inserted at the vein with 3 lumen
- L1: (CVP) at the right side of the heart which measures pressure
- L2: (pulmonary pressure) at the left side of the heart which measures the pulmonary pressure PCCOP
- L3: where specimens are injected
- L4: the balloon at the end of the catheter

Pacemaker

- a. Temporary – for bradycardia
- b. Permanent – destructed SA node
- c. Fixed – preset (60 bpm)
- d. Demand – will not turn on if heartbeat is 60 bpm

Dos and Donts:

1. Prepare defibrillator.
2. Do not go near the microwave.
3. Can't use cellphones. Stay away for about 3 meters.
4. No cleaning and pasting of tooth'

*Priority: Check the HR always.

c. PTCA

- insertion and flattening of clot by the use of catheter and inflating the balloon
- minor procedure and a balloon catheter is inserted

d. CABG

- always uses vein

*Five hallmark sign of MI:

- Persistent chest pain
- Upset stomach
- Lightheadedness
- Shortness of breath
- Excessive sweating (diaphoresis)

e. ECG

P wave - SA→AV – atrial depolarization (0.12 sec, 3mm)
PR interval – Av – 0.12 to 0.20 sec, no height
QRS – ventricular depolarization, 0.10 sec, 5-9 mm

AV Block Disease

- tx: atropine sulfate, pacemaker

a. First Degree – PR always greater than 0.20 sec

- example: 0.24, 0.24, 0.24 sec

b. Second Degree (Type 1)

- progressive prolongation of PR interval
- example: 0.16, 0.20, 0.24 sec, ↑
- tx: atropine sulfate

Type 2 – normal ECG (PR), normal HR

- after the third set/box on the ECG strip, PQRS disappears
- with skip beats
- sudden drop of QRS
- tx: place a pacemaker

c. Third Degree – needs permanent pacemaker

- HR = 20 bpm or lower
- only P wave, without QRS
- slow conduction

Cardioversion

- may be done with patient conscious and has pulse
- 100 volts
- should be synchronized with an ECG

Defibrillation

- done when patient is unconscious and without pulse
- 200-300-260 volts
- ELA medications
- temporarily block the stimulation of heart
- for patients with V-tach and D-fib

Atrial Problems

- a. Atrial Flutter – sawtooth appearance
 - tx: cardioversion and anticoagulant
- b. V-tach – number 1 complication of MI
 - without P-wave and T-wave
 - heart is irritable and without rest
 - widened QRS (0.25 sec)
 - tx: Amiodarone 150 mg to stabilize
 - repolarization
- c. V-fib - cardiac arrest
 - low survival
 - bizarre ECG
 - unconscious and without pulse
- d. Asystole – tx: epi and atropine

Congestive Heart Failure

Class I – client has no symptom and no ADLs limitation

Class II – slight ADL limitation no symptom at rest only during performance of increasing activity

Class III

Class IV – all symptoms are present

a. Left-sided Heart Failure

- C – crackles and cough
- H – hemoptysis (pink-tinged, frothy sputum)
- O – orthopnea
- P – pulmonary edema
- S – shortness of breath

b. Right-sided Heart Failure

- systemic effects
- distended neck veins

Management (for both):

- U – upright position
- N – nitrates (vasodilator)
- L – low sodium intake
- O – oxygen supply
- A – anti-anxiety drugs
- D – Digitalis (drug of choice) or Digoxin
- Therapeutic level: 0.5 – 2 mg
- Toxicity: halo around lights

Aneurysm

- pulsating abdominal mass
- cause: HPN or maintenance drugs for HPN
- can cause abdominal pain
- Diagnostic Test: Arteriogram (definitive)

a. Sacular aneurysm – one bulge (fats)

b. Fussiform – two bulges

c. Dissective – there is a tear

Buerger's Disease

- intermittent claudication
- down position
- DOC: Pletaal
- inflammatory occlusive vascular disease
- cause: smoking
- pulseless with rubor on foot
- common in male
- Concern: stop smoking
- Surgery: amputation

Raynaud's Disease

- hereditary or autoimmune
- red-white-blue phenomenon
- needs same to Buerger's
- blockage on small arteries

RESPIRATORY SYSTEM

Medications

Bronchodilators

1. Sympathomimetic Drugs

- tachycardia: number 1 side effect
- should not be given to patient who has cardiac diseases
- can be given to pregnant because it can cause uterine relaxation

- Beta-2 agonist
- Yutopar, Terbutaline
- Mimics SNS

2. Theophylline

- with therapeutic safety profile of 10-20 mcg/mL
- increase greater than 20 can cause arrhythmia

- B – blood sugar should be checked
- R – restless (increase HR)
- O – oral dryness (SE: decrease saliva)
- N – nervousness (may indicate toxicity)
- C – convulsion
- H – headache
- I – insomnia (should be taken in the morning)

Nursing Management:

1. Avoid beverages.
2. Routine check of blood levels.
3. Check nervousness.
4. Cigarette smoking is avoided.
5. Increase fluid intake.
6. Observe toxicity

*Pneumothorax Hallmark:

1. deviated trachea
2. hyperresonance

*Breath Sounds:

- a. tympanic – hemothorax
- b. stridor – high-pitch, crowing sound
 - heard on children with pneumonia
- c. rhonchi – rattling sound (gun-like)
 - chronic bronchitis
- d. rales – fine, crackling sound
 - indicates fluid in the alveoli

Cough

- a. Productive – expectorant (asthma, chronic bronchitis)
- b. Non-productive – emphysema
- c. Barky cough – pneumonia
 - antitussive (Codeine)

- clear sputum – viral
- yellow sputum – bacterial (antibiotic)
- rusty sputum – strep/staph infection (Co-tri)
 - bacterial pneumonia
- pink-tinged – lung cancer
- frothy sputum – pulmonary edema

Types of Respiration

- a. Kussmaul's – patient with DKA
- b. Cheyne-Stoke – patient who is dying
- c. Tachypnea
- d. Bradypnea
- e. Apnea

Asthma

- mast cells
- triggered by animals, stress, temperature changes
- common in patients who are less than 12 years old

- A – animals
- S – stress
- T – temperature changes
- H – hormonal changes
- M – molds
- A – aspirin, ASA

Type I hypersensitivity – like anaphylactic shock

- Hallmark: wheezing
- nsg dx: Altered airway clearance r/t bronchospasm
- attacks the muscles which releases histamine

Management:

- B – bronchodilators
- R – rest
- O – oxygen low flow (2 L)
- N – nebulizer
- C – chest physiotherapy
- H – high-fowler's position
- I – immunotherapy
- A – avoid ...
- L – liberal fluid intake

Medications:

- A – aminophylline
- S – steroid (presence of bronchospasm)
- T – theophylline
- H – histamine antagonist
- M – mucolytics
- A – antibiotics

Chronic Bronchitis

- "blue bloater"
- hallmark: productive cough in 3 months within 2 consecutive years
- cyanosis is early
- cause: smoking
- common to 45-55 years old
- attacks the goblet cells (thick tenacious secretions)
- irreversible
- hits the bronchioles
- diaphragmatic breathing
- common to fat client
- dirty lungs on CXR
- polycythemia vera
- edema
- right-sided heart failure

Medications: bronchodilators and antibiotics

Nsg Dx: Ineffective breathing pattern

Emphysema

- "pink puffer"
- cyanosis is late
- occurs to people who are 65 years old and above
- cause: smoking
- hits the alveolar cells (alpha-antitrypsin or surfactant)
- thin, hyperinflated lungs (barrel chest)
- pursed-lip breathing

Nursing Interventions:

1. Give small feeding.
2. Nasal cannula should be placed while eating.

Nursing Dx: Altered gas exchange

Flail Chest

- F – fractured ribs (hallmark)
- L – loose chest wall
- A – accidents (cause)
- I – inspiration: chest sucks in
- L – light-headedness
- C – cyanotic
- H – hypoventilation
- E – expiration: chest sucks out
- S – SOB
- T – tracheal deviation

Pulmonary Embolism

- result of an illness
- Virchow's Triad:
 - Hypercoagulability of blood
 - Injury
 - Stasis
- complains chest pain
- cure: 6 months of Warfarin
- wear antiembolic stockings

NERVOUS SYSTEM

Tic Douloureux

- hyperstimulation of CN V
- trigeminal: optic, maxillary, mandibular
- assessment: cotton wisp
- common in female elderly
- priority: pain and spasm
- problem with sensory and motor response
- brain interprets the stimulation wrong (ex: wind as electric volts)

Interventions:

- Mouthwash since the patient can't brush.
- Allowed: room and body temperature only
- Avoid: extreme temperatures
- DOC: Tegretol (Carba)
- Diet: soft

Bell's Palsy

- decrease stimulation of CN 7
- unilateral paralysis of the face
- temporary paralysis, heals after 3-5 weeks
- viral (autoimmune/virus)
- Diet: soft
- Focus: paralysis the drying of eyes
- Goal: hyperstimulate through electricity

Interventions:

- Facial exercise
- DOC: Steroids
- TENS

Meniere's Disease

- triad: vertigo (dizziness), tinnitus, hearing loss (sensorineural)
- Priority: safety
- Diet: low salt
- DOC: Antivert (antihistamine)
Valium
Diamos (diuretic)

Parkinson's Disease

- there is a decrease in dopamine which is responsible for fine motor movements produced in the basal ganglia
- triad/cardinal signs
 - Tremors (initial sign, pill-rolling, unintentional, resting)
 - Rigidity
 - Bradykinesia

*Notes on tremors:

- Lithium toxicity – fine to coarse tremors
- Multiple sclerosis – intentional tremors
- Hyperthyroidism – fine tremors
- Parkinson – pill rolling, unintentional, resting
- Hepatic encephalopathy – asterix (waddling or flapping tremors)

Management:

- Tremor: let the client button his shirt, count matchsticks, activities for fingers
- Cogwheel rigidity: PROME
- Bradykinesia: safety
- Micrographia - small penmanship
- Dysphonia
- Dysphagia – difficulty of swallowing, drooling type
- Railings should be placed on the CR, kitchen, steps and anywhere where there is presence of water.
- Stoop posture is the contracture of the hip which leads to shuffling gait (mini steps).
- Fastinating – gradual increase of speed in stepping
- Propulsive – inability to stop
- Diet: thickened liquid, mechanically soft

Medications:

- C – congentin
- A – artane
- P – parlodel
- A – akineton
- B – Benadryl (limits the S/E of other drugs)
- L – L-dopa (DOC because it can pass through blood-brain barrier. When taking this, B6 intake should be decreased.)
- E – eldepryl
- S – sinemet/symmetril (second DOC)

Multiple Sclerosis

- affects the CNS and airway
- demyelination of myelin sheaths
- common in females (20-40 years old), fair skin, cold region
- marked with remission and exacerbation
- remission: rest, stretching exercises
- exacerbation: hot temperature
- patient has diplopia, blurring, scotoma, blindness
- priority: safety
- Charcot's triad:
 - Scanning speech
 - Intentional tremors
 - Nystagmus
- classical sign: Lhermitte's (flexing of the head sends electrical impulse on the lower extremities)
- ataxia
- spasticity: continuous contraction of the muscles (priority: airway, DOC: Baclofen [muscle relaxant], Valium, Dantrium)
- DOC: Interferons (Avonex, Betaserone, Copaxone)
- DT: MRI (there will be plaques), Schumachers

GBS

- sensori-motor
- PNS, autoimmune, demyelination
- bacterial or viral
- "polyneuritis"
- GIT and respiratory infection 2-3 weeks prior to onset of symptoms

- ascending and symmetrical (opposite to ALS which is ascending and asymmetrical)
- initial sign: ataxia – uncoordinated, problem with balance, clumsiness
- classic sign: areflexia
- priority: respiratory
- drugs: IV Ig + plasmapheresis, Erythromycin

Myasthenia Gravis

- decrease acetylcholine at the myoneural junction, increase cholinesterase
- motor problem
- descending paralysis
- initial sign: ptosis (ensure safety and hyperextend the neck)
- mask-like expression
- hoarseness to dysphagia
- exophthalmos
- DT: Tensilon test (rapid-acting)
- Mestinon: initial drug
- oral anticholinesterase drugs for life
- 30 minutes before meals with milk or crackers
- drugs should be given on time

Myasthenia Crisis

- decrease dosage
- given late
- weakness, dysphagia and drooling

Cholinergic Crisis

- increase dosage
- given early
- weakness, dysphagia and drooling
- antidote: atropine sulfate

*To rule out, Tensilon is given. If resolved, myasthenic.

*Should be at the bedside for all neuro problems:

- Suction
- Oxygen
- Endotracheal intubation
- Tracheostomy set

Increased ICP

- s/sx: ALOC (restlessness)
- affect CN 2, 3, 4, 6
- late sign: Cushing's triad (hyperbradybrady, widened pulse pressure)
- decorticate, decerebrate: dangerous
- vomiting: late sign
- fatal: brain stem herniation

Management:

- SFHM (/ for venous return, x edema)
- Oxygen – alkaline in pressure, prevent coma
- Decrease valsalva
- Mannitol – x for edema
- Steroids – x inflammation

Seizures

- abnormal transmission of the motor cortex (impulses)
- "sign"
- epilepsy: chronic seizure/disease
- DOC: Phenytoin (Dilantin) → can cause gingival hyperplasia (oral care, soft bristled brush, gum massage)
- Adverse Effect: agranulocytosis, sore throat/fever

- Status epilepticus – continuous seizure
 - emergency situation
 - can lead to coma (hypoxia → increase CO₂)
 - give oxygen

- Grandmal/Generalized
 - initial sign: loss of consciousness
- Tonic-Clonic – stage of hypoxia or breathing problem
 - Observe the origin (to determine the type) and duration (to determine the extent of hypoxia)
 - convulsion

Spinal Cord Injury

- C – 8 – airway : tetraplegia
- T – 12 – weak upper : paraplegia
- L – 15 – bladder : paraplegia
- S – 5
- C – 1

- damage of the column
- priority: pain

Spinal Shock

- neurogenic shock
- inflammation of spinal cord that appears within the first 24 hours after injury
- no sensory thus no motor
- temporary loss of ANS
- decrease of all vital signs (hyperbradybrady)
- absent reflexes
- may last for 3 months
- brain is not affected, thinking is active
- drug: Steroid
- spasticity: Baclofen

* C1 – T6 – Avoid full bladder because it can cause autonomic dysreflexia (increase BP that can lead to throbbing headache, nasal congestion and decrease HR.

Alzheimer's Disease

- decrease in acetylcholine
- diet: finger foods
- discourage naps
- decrease fluid intake in the afternoon
- confirmative dx: autopsy and biopsy

Stage I: memory loss

Stage II: wandering

Stage III: apraxia, aphasia, agnosia

Stage IV: withdrawn

Medications:

- C – cognex
- A – aricept (DOC)
- R – remenyl
- E – exelon

*COD: pneumonia, fluid and electrolyte imbalance, malnutrition

*Mary had a little lamb tune:

Parkinson's is CAPABLES (3x)

Parkinson's is CAPABLES

Alzheimer's is CARE

Myasthenia tensilon, mestinon, prostigmine

Myasthenia tensilon

Seizure: Dilantin

MUSCULOSKELETAL SYSTEM

Fracture

- break of a limb

 - open – compound fracture
 - close – simple fracture
 - transverse – straight across
 - oblique – diagonal
 - spiral – spiral, circular
 - compress – over-riding, impacted

- g. greenstick – common in children, other side is broken
- h. comminuted – splintering fragment

- Use Velcro clothing.
- Use slip on shoes.

Management:

- Immobilize
- Increase fluids
- If the patient has embolism, place in a high fowler's position and administer O2.
- DOC: Morphine sulfate

Fx → traction → surgery → cast → assistive devices

Assessing Neurovascular Status

- compare extremities' pulse to the apical pulse
- report pulse deficit
- report any deviation to the doctor except pain

Management for sprain and strain:

- P – protect
- R – rest
- I – ice
- C – compress
- E – elevate
- S – support

Rheumatoid Arthritis

- common in children and females
- autoimmune
- swelling, synovial joints, symmetrical
- morning stiffness
- pain after inactivity
- subcutaneous nodules
- systemic: Sjogrens and Felty's
- fever
- fingers has Swan's neck
- presence of ulnar drift
- thumb has Bouttiniere's
- x aspirin

Gouty Arthritis

- common in men
- "rich men's syndrome"
- metabolic problem
- pain: urate crystals → tophi → crippling → Deformities
- swelling, asymmetrical, systemic
- pain at night
- common site: big toe
- pruritus
- arthrocentesis
- diet: low purine (x organ meats, legumes, sardines, anchovies, alcohol)

Medications:

- Colchicine (NSAID) – acute pain, check for diarrhea which might indicate toxicity
- Allopurinol – maintenance, increase fluid intake to prevent uric calculi

Osteoarthritis

- trauma, age, obesity, athlete
- most common in elderly
- non-inflammatory, cartilage degeneration, asymmetrical
- stiffness after activity
- advise to rest
- presence of Bouchard's and Heberden's
- localized

Management:

- Warm up to prevent fracture and deformities.
- Avoid repetitive movements. If writing, use rubber gripping.
- No zipper and buttons on clothes.