**ORTOPEDIC QUESTIONS**

1. A spontaneous fracture of the left ankle, unrelated to trauma in a 69 year old with osteoporosis is called:
2. Stress fracture.
3. Oblique fracture.
4. Transverse fracture.
5. Pathological fracture.\*
6. Arthritis can severely restrict movement of joints. Which type of joint will be most affected by arthritis?
7. Cartilaginous
8. Synovial\*
9. Fixed
10. Membranous
11. Mr. R suffered a fracture of the left femur. The healing process begins by the formation of:
12. Osteoclasts
13. Osteoblasts
14. Trabeculae
15. A hematoma\*
16. When examining some humerus and radius bones the nurse noted that the metaphysis is a cartilaginous area. The nurse can assume that these bones were from a/an:
17. 60-year-old female
18. 25-year-old male
19. 8-year-old female\*
20. 75-year-old male
21. An important aspect in nursing care of a patient with a fracture and on continuous traction is to ensure that:
22. There is no obstruction along the cords and pulleys.\*
23. The patient lies in prone position
24. The Steinmann’s pin is adjusted regularly.
25. Analgesics are administered throughout.
26. Muscles are kept in a state of readiness by remaining partially contracted. This is termed as;
27. Pronation
28. Tone\*
29. Articulation
30. Supination
31. During exercise, an oxygen debt may develop. This means there is accumulation in the muscles of what?
32. Carbon dioxide
33. Sugar
34. Lactic acid\*
35. Ketoacidosis
36. Skull traction is used to maintain reduction in fractures of the:
37. Skull.
38. Cervical vertebra.
39. Thoracic vertebra.
40. Lumber vertebra.
41. An appropriate health message shared with a patient on traction to avoid constipation includes:
42. Drinking large quantities of fluids.\*
43. Eating food rich in proteins.
44. Getting accustomed to opening bowels twice a day.
45. Avoiding strenuous muscular exercises.
46. Paget’s disease is:
47. a systemic condition of overall reduction in bone mass or density
48. an infectious musculoskeletal disorder; an infection of the bone
49. a progressive deforming disease resulting from increased resorption of bone and increased but abnormal regeneration\*
50. is softening of the bones due to lack of calcium and phosphorus balance due to a lack of vitamin D
51. List six (6) factors that can affect bone healing (3 marks)

*Tissue fragments between bone ends.*

*Deficient blood supply*

*Poor alignment of bone ends*

*Continued mobility of bone ends*

*Infection*

*Systemic illness*

*Malnutrition*

*Drugs e.g. corticosteroids*

*Ageing*

1. State five (5) complications that may occur following a compound fracture of the femur (5 marks)

***Infection*** *- devitalized and contaminated tissue is an idea medium for many common pathogens.*

***Compartment syndrome*** *- increasing oedema may lead to pressure increase within the closed spaces of the tissue compartments.*

***Venous thrombosis*** *- this is precipitated by venous stasis caused by incorrectly applied casts or traction, local pressure in a vein, or immobility.*

***Fat embolism syndrome*** *- this may be due to fat being released from the marrow of injured bone to the circulation.*

***Severe haemorrhage*** *- related to open wound and severed blood vessels.*

***Malunion*** *- due to inappropriate alignment.*

1. State the differences between a sprain, a strain, and a dislocation giving an example of each. (6 Marks)
2. State four (4) indications for cast application (4 marks)

*1. May be used to immobilize fractures to relieve pain and allow healing to take place*

*2. Casts are used on sprains for immobilization a relief of pain*

*3. Casts are used on joint infections for immobilization and rest to prevent movement which causes pain and spread of the infection*

*4. They may be used to relieve and immobilize joints suffering from acute arthritis/gouts*

*5. They are used to protect lacerations over joints*

*6. They are used to protect certain wounds of hands and feet e.g. bite wounds*

1. State five (5) stages of the healing process of bones (5 marks).

*A* ***hematoma*** *forms between the ends of bone and in surrounding soft tissues.*

*Development of* ***granulation tissue*** *begins following development of acute inflammation and accumulation of inflammatory exudate, containing macrophages that phagocytose the hematoma and small fragments of bone without blood supply (this takes about 5 days); fibroblasts migrates to the site.*

***Callus formation*** *begins as large number of osteoblasts secretes spongy bone, which unites the broken ends, and is protected by an outer layer of bone and cartilage.*

***Maturation of callus*** *takes place over the next few weeks and the cartilage is gradually replaced with new bone.*

***Reshaping/modeling*** *of the bone continues and gradually the medullary canal is reopened through the callus (in weeks or months).*

1. State six (6) types of fractures (6 marks)

*Avulsion is a fracture of bone resulting from strong pulling effect of tendons or ligaments at the bone attachment.*

*Closed or simple fracture—skin is not broken*

*Open or compound fracture—skin is broken (high risk of infection)*

*A comminuted fracture is a fracture with more than two fragments. The smaller fragments appear to be floating.*

*A displaced/overriding fracture involves a displaced fracture fragment that is overriding the other bone fragment. The periosteum is disrupted on both sides.*

*A greenstick fracture is an incomplete fracture with one side splintered and the other side bent.*

*An impacted fracture is a comminuted fracture in which more than two fragments are driven into each other.*

*An intraarticular fracture is a fracture extending to the articular surface of the bone.*

*A longitudinal fracture is an incomplete fracture in which the fracture line runs along the longitudinal axis of the bone.*

*An oblique fracture is a fracture in which the line of the fracture extends in an oblique direction.*

*A pathological fracture is spontaneous fracture at the site of a bone disease.*

*A spiral fracture is a fracture in which the line of the fracture extends in a spiral direction along the shaft of the bone.*

*A stress fracture is a fracture that occurs in normal or abnormal bone that is subject to repeated stress, such as from jogging or running.*

*A transverse fracture is a fracture in which the line of the fracture extends across the bone shaft at a right angle to the longitudinal axis.*

*Comminuted facture—bone crushed*

*Impacted fracture—bone pushed into another bone*

*Depressed fracture—skull bone pushed in*

*Complicated fractures: include fracture of skull, fracture of vertebrae—>spinal injury; fracture of rib*

1. Draw and label a diagram showing the posterior view of the femur. (5 marks)



1. Explain five (5) specific observations you will make on a patient after application of a plaster of Paris for the first 24 hours **(5 marks).**

*Monitor the neurovascular status of the casted extremity every 1-2 hours for the first 24 hours.*

*Examine the skin around the cast edges for redness and irritation.*

*Inspect the cast for an increase in drainage every shift.*

*Ask the patient/client about pain and the intensity of pain.*

*Assess for pallor by pressing the nail beds distal to the area of application.*

*Check sensation by asking the patient/client if numbness or tingling is present (paresthesia).*

*Check pulses by palpating the pulses at the distal end to the cast.*

1. Describe two examination procedures that can be used in the diagnoses of Congenital Hip Dysplasia/Dislocation **(2 Marks)**

***Diagnostic evaluation:***

***Ortolani’s test****—examiner abducts and externally rotates the flexed thigh with infant lying supine—normal is to hear no sounds or clicks*

***Barlow’s test****—if child is 6 months or less old, after Ortolani’s test then use the thumb to apply pressure backward and outward on the inner thigh—normal is that the head of the femur should remain in the acetabulum*

***X-ray*** *for confirmation of the diagnosis (in older children)*

1. List five predisposing factors to osteoporosis. **(2.5 marks)**

*Immobility.*

*Age – postmenopausal women (60 years +)*

*Nutritional disorders; malabsorption syndrome*

*Endocrine disorders; Cushing’s syndrome, hyperparathyroidism, large doses of steroids*

*Excessive exercise (running more than 65 km per week) in young women may alter menstrual function and estrogen levels causing low bone mineral (calcium) density*

*Smoking (women who smoke an average of 12 cigarettes per day have lower*

* + *serum estrogen)*

*Alcohol abuse*

*Use of corticosteroids, which induce osteoporosis because they depress activity of osteoblasts*

*Caffeine intake (causes calcium loss)*

*Decreased calcium intake*

*Lack of weight-bearing exercise/physical inactivity*

1. List **five** predisposing factors to osteomyelitis **(2.5 marks**

***Predisposing factors:***

*Open wound*

*Sore throat*

*Systemic infections that can be transmitted to the bone e.g. diabetes or*

*Peripheral vascular disease,*

*Sickle cell disease*

*and malignancies*.

1. During assessment of a patient with osteomyelitis, the nurse makes a diagnosis of "impaired physical mobility related to presence of infection". State five **(5)** nursing actions related to the above nursing diagnosis? **(5 marks)**

*Assess range of motion of joints and ability to bear weight. (Activity maintains musculoskeletal strength. Rest to affected part decreases spread of*

*Purulent material.)*

*Help patient move affected tissue. (Assistance maintains comfort and use of affected part.)*

*Encourage ROM exercises for affected parts.*

*(ROM movements maintain strength of muscles and joints and prevent atrophy of tissues.)*

*Encourage self-care as able; assist as needed. (Self-care maintains independence and strength.)*

*Assist with use of ambulatory aid if allowed out of bed. (Ambulation maintains body functions, prevents loss of strength, and helps patient maintain*

*Interactions and socialization.)*

*Encourage diversionary activities. (Helps maintain interactions, interest, hopefulness, and positive outlook.)*

1. Briefly describe the pathophysiology of rheumatoid arthritis. **(5 marks)**

***Pathophysiology:***

*The synovial lining of the joint is one of the major tissues initially inflamed. The inflammation is noted by marked oedema, tenderness, pain and limitation of motion. The involved joint becomes reddened and hot.*

*As the inflammatory changes continue, the synovium thickens and proliferates inside and outside the joint (panus formation). The joints are symmetrically inflamed bilaterally, a characteristic that aids in the diagnosis of rheumatoid arthritis.*

*As the joint inflammation progresses, other joint tissues become secondarily involved, especially the cartilage. Inflammatory changes lead to deterioration of the cartilage, and erosion of its surfaces leaves exposed bone surfaces; these in turn develop erosions, bone fissures, cysts or bone spurs (osteophytes).*

*Ligaments and tendons around or in the inflamed joints also become inflamed, leading to shortening and fibrosis (stiffening and scarring); consequently, contractures and subluxation of the joint are noted.*

*Pain develops from oedema, inflammation and grating of unprotected bone surfaces that rub against each other with movement and weight bearing. Systemic manifestations of rheumatoid arthritis may be noted in the heart, lungs, kidneys and skin.*

1. State four (4) indications of amputation. (4 marks)

*Indications:*

*Amputation may be required after severe trauma, crush injuries, or severe sepsis (gas gangrene) or gangrene due to loss of circulation:*

* *Inadequate tissue perfusion as a result of diabetes mellitus or other vascular diseases, resulting in gangrene since lack of perfusion leads to death and once a bone has undergone necrosis it cannot regenerate.*
* *Trauma may be so severe that*
* *Malignant tumour.*
* *Congenital deformities.*
* *Uncontrolled infection (usually of the bone).*

1. State the difference between a brain contusion and concussion **(4 marks*)***

*A brain contusion is a bruise of the brain tissue while a brain concussion is a transient and reversible post-traumatic alteration in mental status lasting for seconds to minutes.*

*In a contusion there is bleeding in the brain tissue due to small blood vessel leaks. In concussion there is no bleeding involved.*

*Contusions are more serious than concussions**they can involve variable neurological effects depending on the location and size of brain tissue involved.*

*Treatment of concussion involves principally of observation for signs of intracranial bleeding and increased intracranial pressure. Treatment of a contusion may include surgical intervention to relieve a blood clot.*

1. Describe the management you would give to a patient with gout. (10 marks)

*Laboratory investigations to check the amount of uric acid in the body should be done in order to establish the extend of the disease process and plan the care. Indocid 25-50 mg should be given three times a day as this is an anti-inflammatory as well as an analgesic. Allopurinol (Zyloprim) 200-600 mg daily in divided doses twice a day to reduce uric acid synthesis. Give Colchicine 0.5-1 mg every hour during the actute pain episode until pain relieved or until side effects occur (nausea, vomiting, and diarrhoea) to a maximum of 4 mg in 24 hours to decrease phagocytosis and inflammation of the joints.*

*Probenecid (benemid) 250 mg twice a day for one week should be given, then 500 mg twice a day for six months. This should lnot exceed 2 g/day. This acts by inhibiting tubular reabsorption of urates, with increased excretion of uric acid. Application of ice bags help to decrease inflammatory process; allow affected joint to rest on ice bag so pain is not increased. Do not allow patietn to bear weight on the involved joint. Bed cradle should be used to keep covers off extremely sensitive joints. Diet: weight reduction, force fluids to prevent formation of kidney stones; avoid alcohol, liver which will raise the uric acid level.*

*Apply splint to affected joint if ordered to rest the joint. Perform gentle ROM exercises after acute pain has subsided in order to prevent contractures. Encourage ambulation when pain relief has been achieved to aid in preventing complications related to immobility. Encourage return to normal activities in order to promote independence. Give health education on the following: methods of keeping weight off painful limbs, importance of continuing drugs, importance of weight reducing diet, importance of reducing alcohol ingestion, importnce of taking plenty of oral fluids, recognition of side effects of drugs and recognition of impending gout attack.*

1. Mr. Juma is admitted to the ward having a simple mid-shaft fracture of the right femur and a skeletal traction is applied.

(a) State four (4) clinical features of a fracture (4 marks)

(b) Describe the specific nursing management of Mr. Juma till discharge (14 marks)

(c) List four (4) complications that Mr. Juma may develop (2 marks)

(a) State four (4) clinical features of a fracture (4 marks)

* *Pain & tenderness when moving or palpating fracture site—don’t touch open fracture site (cover with dressing)*
* *Abnormal movement of the part (inability to use injured part—pain or paralysis)*
* *Swelling and sometimes bruising*
* *Deformity or misalignment of the injured (difference in length or shape of extremity)*
* *Symptoms and signs of shock (especially at risk if thigh bone or pelvis injured)*

*SometimesCoarse bony grating”crepitis” from bone ends rubbing together*

*Sometimes “snap” is heard or felt by casualty*

***NOTE****: May also have internal injuries such as bleeding, a collapsed lung, perforations*

(b) Describe the specific nursing management of Mr. Juma till discharge (14 marks)

***Two main aims:***

***a) Prevent simple fracture becoming a compound fracture***

***b) Arrange the transportation of patient as quickly as possible for an X-ray and essential treatment.***

* ***Reduce pain****—stop ends of broken bones from moving. Whole bone must be immobilized so it cannot move by SPLINTING. [Carefully support affected part]*

*Splints—can use bandages to tie bone firmly to the body OR can provide other rigid support. Splints can be made from wood, magazines or newspapers, wood, umbrellas, sticks, pillows. Belts, ties, scarves, kangas may be used as bandages. Splints must be LONG enough to include joints ABOVE and BELOW the injury to avoid movement of the bone. Bone ends which move increase pain and shock. Splints should be well padded. Knots should be tied on the splint to prevent pressure on the skin.*

* ***Prevent infection:*** *remove or cut away victim’s clothing for visual inspection.*

***Control bleeding****. Cover open injury with cleanest cloth possible, but do not try to replace bone ends or fragments. Apply splints and elevate limb and transport to medical facility as soon as possible.*

***Prevent/Reduce shock:*** *Control bleeding and give adequate support to the broken limb when splinting (may need to TREAT for shock) [keep warm & comfortable as possible]*

***Prevent further injury***

***a) During transportation****—careful lifting & positioning—Elevate (immobilize first) to decrease swelling, put casualty on hard surface to transport if leg is fractured.*

**b) Monitor for changes in peripheral neurovascular function.**

***1. Circulatory Care:*** *(Arterial or venous insufficiency) Check peripheral circulation:* ***Pulses*** *(if distal pulses are present then proximal pulses are present), capillary refill, colour—check for* ***pallor****, temperature and oedema-monitor for signs of swelling). Monitor degree of* ***pain****—(pain can be due to bandage, splint or plaster being too tight). Remember to protect extremity from further injury. Place extremity in a dependent position.*

*Peripheral Sensation Management: Prevention or minimization of injury or discomfort in client with altered sensation. Monitor for* ***paranesthesia****: numbness, tingling, hyperesthesia and hypoesthesia. Monitor for* ***Paralysis*** *(check movement/muscle function-check fingers/toes)*

(c) List four (4) complications that Mr. Juma may develop (2 marks)

*Arthritis*

*Deep vein thrombosis*

*Pulmonary embolism*

*Fat embolism*

*Blood vessel injury*

*Compartment syndrome*

*Internal bleeding*

*Nerve injury, such as foot drop*

*Osteomyelitis*

*Reflex sympathetic dystrophy*

*Shortening of the leg*

*Non-union*