**Question 1**

The MOST common cause of infectious arthritis in young adults is?

A S. aureus

B H. influenza

C N. gonorrhoeae

D Salmonella

E S. pneumonia

Explanation C

Gonococcal arthritis is the commonest cause of septic arthritis in adolescents and young adults.

Salmonella is the expected organism in sickle cell patients.

Staphlococcal and gram negative bacteria are expected in patients with co-morbid disease (RA, HIV, cancer), IVDU

Note: septic arthritis is the most important diagnostic consideration in acute joint pain, because bacterial infection and inflammatory response can destroy a joint within days

**Question 2**

In osteoarthritis, whichof the following ststements is CORRECT?

A The knees and hands are more commonly affected in men and the hips in women

B Chrondrocytes play a role in cartilage destruction

C Characteristic symptoms include deep, achy pain that improves with use

D Osteophytes develop on top of the articular surface

E There is a marked synovial reaction

Explanation B

Osteoarthriits implies an inflammatory disease however, even though the inflammatory cells may be present , OA is considered to be an intrinsic disease of cartilage in which biochemical and metabolic alterations in individuals with genetic susceptibility result in its breakdown

The mechanisms leading to OA are unclear, but chondrocytes are at the centre of the disease process, which can be divided into several processes

1-chondrocyte injury, which is related to genetic, ageing and biochemical factors

2- Early OA in which chondrocytes proliferate and secrete inflammatory mediators, collagens, proteoglycans, proteases, which act together to remodel the cartilaginous matrix and initiate secondary inflammatory changes in the synovium and subchondral bone

3- Late OA, repetitive injury results in chondrocyte dropout, marked loss of cartilage and extensive subchondrol bone damage

Morphology: The synovium is usually only mildly congested and fibrotic, and may have scattered inflammatory cells. Bony osteophytes (outgrowths) develop at the margins of the articular surface.

In most cases OA appears insidiously, without apparent cause. The disease is usually oligoarticular but may be generalised. Patients with primary disease are often asymptomatic until they are in there 50s. Gender has some influence on distribution. The knees and hands are more commonly affected in women and the hips in men

Characteristic symptoms include deep, achy pain that worsens with use, morning stiffness, crepitus and limited range of movement

**Question 3**

With regard to rheumatoid arthritis (RA), which of the following is CORRECT?

A In the joint it is confined to the synovium and does not involve the articular cartilage

B It is confined to joints and skin

C Xrays of joints reveal articular marginal erosions

D There is decreased vascularity in the pannus

E Caseous necrosis is typical of rheumatoid nodules

Explanation C

Radiology finding in RA: Initially, joint spaces in the small joints of the hands show widening as a result of effusion; however, with cartilage destruction, joint spaces narrow. Erosions usually begin at the bare area of the joint not covered by cartilage, such as the intracapsular articular margins. Marginal erosions occur as a result of direct mechanical action of the hypertrophied synovium and granulation tissue.

Pannus formation: a vascularised mass of synovium and synovial stroma containing inflammatory cells, granulation tissue and synovial fibroblasts which grows over the articular cartilage and causes its erosion. In time, after the cartilage has been destroyed , the pannus bridges the apposing bone to form an ankylosis, which eventually ossifies and results in bony ankylosis.

Rheumatoid nodules are firm, non tender and contain a central zone of fibrinoid necrosis surrounded by epitheloid histocytes, lymphocytes and plasma cells.

RA is a chronic systemic inflammatory disorder that may affect many tissues and organs-skin, joints, blood vessels, heart, lung and muscles

**Question 4**

Which of the following is a disturbance of bone mineralisation?

A Osteoporosis

B Paget's disease

C Rickets

D Hypertrophic pulmonary osteoarthropathy (HPOA)

Explanation C

Rickets: defect in matrix mineralization, most often due to vitamin D deficiency or vitamin metabolism.

Osteoporosis: increased porosity of the skeleton due to reduced bone mass.

Paget's Disease: osteoclastic bone activity and hectic bone formation.

Hypertrophic pulmonary osteoarthropathy (HPOA): paraneoplastic

**Question 5**

Regarding myositis ossificans in skeletal muscle, which of the following statements is correct?

A Resembles osteosarcoma in the elderly

B Does not resemble normal bone

C Follows resolution of a muscle tear

D Is painless from the start of the disease

Explanation A

In 50% of cases, myositis ossificans follows an episode of trauma in young adults. It does resemble an osteosarcoma in the elderly and must be distinguished from extraskeletal osteosarcoma. It is metaplastic bone- however, this type of metaplasia is less clearly seen as an adaptive response (rather a response form tissue injury) It is initially painful but becomes painless after a while. It is best to wait 6-12months to allow for full bone maturation before surgical excision, otherwise it may reoccur.

Note: it is a pathological-metaplastic process. But metaplasia is where one type differentiated cell type is replaced by another cell type. The cell types are still normal cells just adapting to the environment

**Question 6**

Which of the following statements is correct regarding osteomalacia?

A It is associated with decreased osteoid matrix deposition

B There is increased Ca absorption from gut

C It is associated with decreased parathyroid hormone (PTH)

D It is caused by a (1,25)2DH3-calciferol deficiency

Explanation D

Osteomalacia results FROM hypocalcaemia. Parathyroid hormone (PTH) production is increased, which

 - Activates renal alpha hydroxylase, thus increasing the amount of active vitamin D and calcium absorption

 - Mobilizes calcium form bone

 - Decreases renal calcium excretion

 - Increases renal excretion of phosphate.

Thus the serum calcium level is restored to near normal but hypophosphataemia is present so bone mineralization is impaired. There is an increase in osteoid matrix deposition in this condition

**Question 7**

Regarding bacterial septic arthritis

A The joint most affected in non-gonococcal septic arthritis is the knee

B The different causative organisms affects men and women equally

C The main causative organism in adults is gonococcus

D Joints are affected more commonly by direct inoculation

Explanation A

In bacterial septic arthritis the bacteria usually seed the joint during an episode of bacteraemia. Joints can become infected by direct inoculation or from contiguous spread from a soft tissue abscess or focus of osteomyelitis. H. influenza arthritis predominates in children <2yrs. Staf is the main causative agent in older children and adults. Gonococcus is prevalent during late adolescence and young adulthood. Those with sickle cell anaemia are prone to infection with SALMONELLA at any age. These joint infections affect the sexes equally except for gonococcus which is seen mainly in sexually active women. In 90% of non-gonococcal cases, the infection involves only a single joint, usually the knee followed in frequency by the hip, shoulder, elbow, wrist and sternoclavicular joints.

**Question 8**

Which of the following is true regarding Osteomyelitis?

A In 70% of cases, no organism is found

B The metaphysis is the common site of infection in children

C In 30% of acute cases fail to resolve with drainage and antibiotics

D Staph Aureus is usually the causative organism in neonates

Explanation B

All types of organisms including bacteria, viruses, fungi and parasites can produce osteomyelitis. Pyogenic osteomyelitis is most often caused by bacteria. Organisms reach the bone via haematogenous spread, extension from a contiguous site and direct implantation. Staph. aureus is responsible for 80-90% of cases of pyogenic osteomyelitis. IVDU and patients with genitourinary tract infections often have E.Coli, Pseudomonas and Klebsiella as the causative organisms. In the neonatal period, H.influenzae and group B streptococci are most commonly found and in sickle cell disease, salmonella in prevalent. However in 50% of cases there are no causative organisms found. The location of infection in the long bone varies with age due to the osseous vascular circulation. In the neonate, the metaphysis and epiphysis are the main sites, whereas in children it is the metaphysis and in adults the epiphysis and subchondral regions. 5-25%of acute cases fail to resolve with drainage and antibiotics, and go onto chronic infection.