Musculoskeletal

1. Imaging techniques: indications and limitations (including radiography, CT, MRI, nuclear scintigraphy/PET, diagnostic and therapeutic aspiration and injections, percutaneous biopsy, ultrasound and bone mineral density)

2. Normal/normal variants (including primary and secondary ossification centers and sequence of ossification, physiologic radiolucencies, vascular channels, physiologic bowing, transverse/growth line, sesamoids and accessory ossicles, accessory muscles, tug lesions)

3. Congenital and developmental spine abnormalities (including scoliosis, os odontoideum, Klippel-Feil, vertebral anomalies, Schmorl node, Scheurmann disease, limbus vertebra)

4. Congenital anomalies and dysplasias
    - Lower extremity (including developmental hip dysplasia, Blount disease, discoid meniscus, foot deformities, syndactyly, polydactyly)
    - Upper extremity (including Madelung deformity, congenital dislocation of the radial head, carpal coalition, syndactyly, polydactyly, Sprengel deformity)
    - Diffuse/multifocal (including achondroplasia, osteogenesis imperfecta, sclerosing osseous dysplasias, osteopetrosis, cleidocranial dysplasia/dysostosis, amniotic band syndrome, connective tissue disorders such as Ehlers-Danlos syndrome and Marfan syndrome, neurofibromatosis, cerebral palsy, muscular dystrophies, congenital insensitivity to pain)
    - Miscellaneous (including mucopolysaccaridosis, tuberous sclerosis, Down syndrome, Turner syndrome, Apert syndrome, fibrodysplasia/myositis ossificans progressive, macrodystrophia lipomatosa, pachydermoperiostosis, nail-patella syndrome)

5. Infection (including routes of spread, predisposing factors, common and other organisms including syphilis, rubella, leprosy, parasitic)

    - Osteomyelitis (common sites, terminology including sequestrum, involucrum, cloaca, Brodie abscess, sclerosing osteomylitis, multifocal)
    - Septic arthritis (bacterial, Tb, Lyme disease)
    - Soft tissue (including abscess, cellulitis, myositis, gas gangrene, necrotizing fasciitis)

6. Tumors and tumor-like conditions
    - Imaging features (including size, location, aggressiveness/growth pattern, internal characteristics, involvement of adjacent structures, margin/zone of

transition, pattern of osteolysis, periosteal reaction, soft tissue mass, matrix/calcification, biopsy techniques, therapy options)

- Benign bone lesions (including cartilaginous, fibrous, osteogenic, lipoid, vascular and miscellaneous)

- Miscellaneous lesions including Ollier disease, Maffucci syndrome, osteofibrous dysplasia (ossifying fibroma), liposclerosing myxofibrous tumor (LSMFT), hemophilic pseudotumor, hemangiopericytoma, Gorham disease, giant reparative granuloma

- Malignant bone lesions (including cartilaginous, fibrous, osteogenic, vascular, miscellaneous and secondary tumors from radiation, Paget disease, metastases)
- Benign soft tissue lesions (including fibrous, neural, cartilaginous, vascular, lipoid, muscle and miscellaneous
- Malignant soft tissue lesions (primary and secondary from leukemia, lymphoma, metastases)

7. Trauma
    - General principles including relationship of force and deformation to fracture, mechanisms of injury, relevant anatomy and terminology, fracture patterns and associated injuries, fracture description, bone and soft tissue stress injuries, fracture healing, complications, open fractures)
    - Repetitive trauma (tendinopathy, enthesophytes)
    - Soft tissue injuries and myositis ossificans, (including grades of muscle and ligament tear)
    - Thermal trauma (including burns and cold injuries)
    - Foreign bodies (including gunshot wounds)
    - Adult trauma
    - Pediatric trauma (including non-accidental trauma/child abuse)

8. Metabolic disorders (including osteoporosis, hyperparathyroidism, thyroid diseases, rickets and osteomalacia, renal osteodystrophy, pituitary disorders, intoxication/poisoning such as heavy metal/lead, fluorine, hypervitaminosis A and D)

9. Hematologic disorders (such as anemia, sickle cell, thalassmia, hemophilia, myelofibrosis, extramedullary hematopoiesis, marrow reconversion)

10. Osteonecrosis (causes, site specific disease)

11. Periosteal reaction (including primary and secondary hypertrophic osteoarthropathy and infantile cortical hyperostosis/Caffey disease)

12. Miscellaneous (including Paget disease, sarcoidosis, radiation induced marrow changes, mastocytosis, amyloidosis,, lipid storage diseases)

13. Arthropathy
    - General features (including distribution, soft tissue changes, joint space width, bone density, osteophytes, subchondral cysts, osseous erosions, proliferative new bone, joint deformity, calcification)
    - Osteoarthritis
    - Inflammatory (including rheumatoid, psoriatic, Reiter syndrome, ankylosing spondylitis, enteropathic, spondyloarthropathy, juvenile chronic arthritis)
    - Connective tissue diseases (SLE, scleroderma, dermatomyositis, polymyositis)
    - Crystal-associated (including gout, CPPD)
    - Joint replacement procedures and complications
    - Miscellaneous (including hemochromatosis, pigmented villonodular synovitis, synovial chondromatosis, osteitis condensans ilii, degenerative disc disease, DISH, alkaptonuria/ochronosis)

Sample Questions:

1. The ilopsoas bursa normally communicates with the hip joint at which of the following sites?

A. Between the iliofemoral and pubofemoral ligaments

B. Between the ischofemoral and iliofemoral ligaments

C. Between the pubofemoral and zona orbicularis ligaments

D. Between the ischiofemoral and zona obicluaris ligaments

2. Study the image and proceed to the following screen

The most likely diagnosis is?

- A. Rheumatoid arthritis
- B. Reactive arthritis
- C. Multicentric reticuloshistiocytosis
- **D. Gout**

3. Study the image and proceed to the next screen

The best next step is?

- A. Biopsy
- B. Additional sequences with conrast enhancment
- C. CT
- D. Radionuclide scan
- **E. Compare to radiographs**

Study the images and proceed to the next screen

The diagnosis is?

- A. Metastasis
- B. Hemangioma
- C. Lymphoma
- **D. Paget disease**