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Differential Diagnoses in Musculoskeletal Disease

DDX In MSK

I see a disclaimer in your future*



***These differentials are not intended to be all inclusive.**

Consult a textbook for all-inclusive differentials.

They are designed as an aid to remembering a few of the most important causes for each of the findings shown.

Diffuse Increase in Bone Density

1. 1° malignancy – none
2. 2° malignancy - metastases
3. Non-malignant disease - Paget's Disease
4. Myelosclerosis, e.g. Sickle Cell Anemia
5. Fluorosis
6. Mastocytosis
7. Osteopetrosis
8. Hypervitaminosis D

Diffuse Decrease in Bone Density

1. Osteoporosis
 - a. Multiple myeloma
 - b. Steroid administration
2. Osteomalacia
3. Hyperparathyroidism
4. Immobilization
5. Osteogenesis imperfecta

Focal Sclerotic Lesion(s)

A. Primary malignancy

1. Osteosarcoma

B. Secondary malignancy

1. Metastases
2. Lymphoma

C. Non-malignant

1. Paget's Disease
2. Bone island(s)
3. Healed fracture(s)
4. Bone infarct(s)
5. Osteoid osteoma

Focal lytic lesion

A. 1° malignancy

1. Myeloma

B. 2° malignancy

1. Metastases

C. Non-malignant

1. Eosinophilic granuloma

2. Brown tumors

Round Cell Lesions

1. Lymphoma and leukemia
2. Ewing's sarcoma
3. Multiple myeloma
4. Osteomyelitis
5. Neuroblastoma

Expansile Lesion

1. 1° malignancy – Plasmacytoma
2. 2° malignancy - Mets
3. Non-malignant – Aneurysmal bone cyst
4. GCT
5. Fibrous dysplasia
6. Brown tumor
7. Enchondroma

Expansile Lesion of Rib

1. 1° malignancy – Plasmacytoma
2. 2° malignancy – Mets
3. Non-malignant – Fibrous dysplasia
4. Chondrosarcoma
5. Enchondroma
6. Eosinophilic granuloma
7. Neurofibromatosis

Blowout Lesion

1. Metastases, esp. kidney, thyroid, lung
2. Giant Cell Tumor
3. Plasmacytoma
4. Chondrosarcoma

Soap-bubbly Lesion

1. 1° Malignancy - Plasmacytoma
 1. Chondrosarcoma
2. 2° Malignancy - Mets
3. Non-malignant - Fibrous dysplasia
4. GCT
5. ABC
6. Chondromyxoid fibroma
7. Enchondroma
8. EG

Lesions with Associated Soft Tissue Masses

1. Multiple myeloma
2. Metastases
3. Osteomyelitis
4. Primary malignancies of bone
 1. Osteosarcoma
 2. Chondrosarcoma
 3. Fibrosarcoma
 4. Ewing's sarcoma

Sclerotic Cortical lesions

1. Osteoid osteoma
2. Brodie's abscess
3. Healing stress fracture

Short Thumb

1. Myositis ossificans progressiva
2. Fanconi's syndrome
3. Holt-Oram Syndrome

Short 4th Metacarpal

1. Turner's syndrome
2. Pseudohypoparathyroidism*
3. Pseudopseudohypoparathyroidism

*Short, obese, retarded, abnormal dentition, corneal opacities, hypocalcemia, hypophosphatemia

Clinodactyly

Inward curvature of 5th finger

1. Down's syndrome
2. Cornelia de Lange syndrome*
3. Carpenter's syndrome**

*Retarded, hirsutism, feeble cry, arched palate, small nose, brachycephalic skull

** Acrocephalopolysyndactyly = retardation, hypogonadism, PDA, polysyndactyly

Polydactyly

1. Isolated anomaly
2. Ellis-Van Creveld syndrome*
3. Carpenter's syndrome**

*Chondroectodermal dysplasia = pointy teeth, brittle nails, scant hair, accelerated maturation, Wormian bones, shortening of all bones

** Acrocephalopolysyndactyly = retardation, hypogonadism, PDA, poly-syndactyly

Syndactyly

Osseous c or s soft tissue fusion

1. Apert's syndrome*
2. Carpenter's syndrome
3. Down's syndrome

*Hypertelorism, exophthalmus, underdeveloped sinuses, pseudarthroses, high palate

Erosion - Distal Clavicle

1. Rheumatoid Arthritis
2. Hyperparathyroidism
3. Scleroderma
4. Cleidocranial dysplasia

Protrusio Acetabuli

1. Paget's disease
2. RA
3. Osteomalacia
4. Osteoporosis
5. Mucopolysaccharidosis

Acro-osteolysis

1. Thermal injury, burns, frostbite
2. Scleroderma
3. Hyperparathyroidism
4. Psoriasis
5. Raynaud's disease
6. PVC worker

Avascular Necrosis

1. Idiopathic (Legg-Calve-Perthe's Disease)
2. Steroid administration
3. Sickle cell anemia
4. Arteritis - collagen-vascular disease
5. Trauma
6. Gaucher's
7. Pancreatitis
8. Fat embolism

Hypertrophic Osteoarthropathy

1. Carcinoma of the lung
2. Mesothelioma
3. Chronic lung infection (TB)
4. Chronic liver disease, e.g. cirrhosis
5. Ulcerative colitis

Lesions That Affect The Spine

1. Osteoblastoma
2. Chordoma
3. Aneurysmal bone cysts
4. Metastases

Lesions That Affect The Pelvis

1. Chondrosarcoma
2. Plasmacytoma
3. Chordoma

Posterior Scalloping

1. Neurofibromatosis
2. Achondroplasia
3. Spinal cord tumor (ependymoma)

Anterior Scalloping

1. Aortic aneurysm
2. TB
3. Neurofibroma

Lucent Metaphyseal Bands

1. Normal
2. Leukemia
3. Neuroblastoma
4. TORCH infection

Dense Metaphyseal Bands

1. Normal
2. Lead poisoning
3. Treated leukemia
4. Healing rickets

Bone Within a Bone

1. Osteopetrosis
2. Paget's disease
3. Thorotrast

Chondrocalcinosis

1. Pseudogout
2. Gout
3. DJD
4. Hyperparathyroidism
5. Hemochromatosis
6. Wilson's Disease

Ankylosis of SI Joints

1. Ankylosing spondylitis
2. Psoriasis
3. Reiter's syndrome
4. Inflammatory bowel disease
5. TB

Intramedullary Calcification

1. Enchondroma
2. Bone infarct
3. Chondrosarcoma

Thinned Ribs (Ribbon-Ribs)

1. Neurofibromatosis
2. Osteogenesis imperfecta
3. Trisomy 18
4. Gorham's Disease

Wide Ribs

1. Achondroplasia
2. Fibrous dysplasia
3. Rickets (rosary)
4. Marrow packing disorders
 1. Thalassemia
 2. Mucopolysaccharidosis, esp. Hunter's and Hurler's
 3. Gaucher's disease

Lytic Lesion - Finger

1. Enchondroma
2. Epidermoid inclusion cyst
3. Glomus tumor
4. ABC
5. GCT
6. Met from lung, hepatoma

Wormian Bones

1. Normal
2. Hypothyroidism
3. Down's Syndrome
4. Cleidocranial dysostosis
5. Osteogenesis imperfecta