Tikrit university
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Metabolic disorders of the skeleton

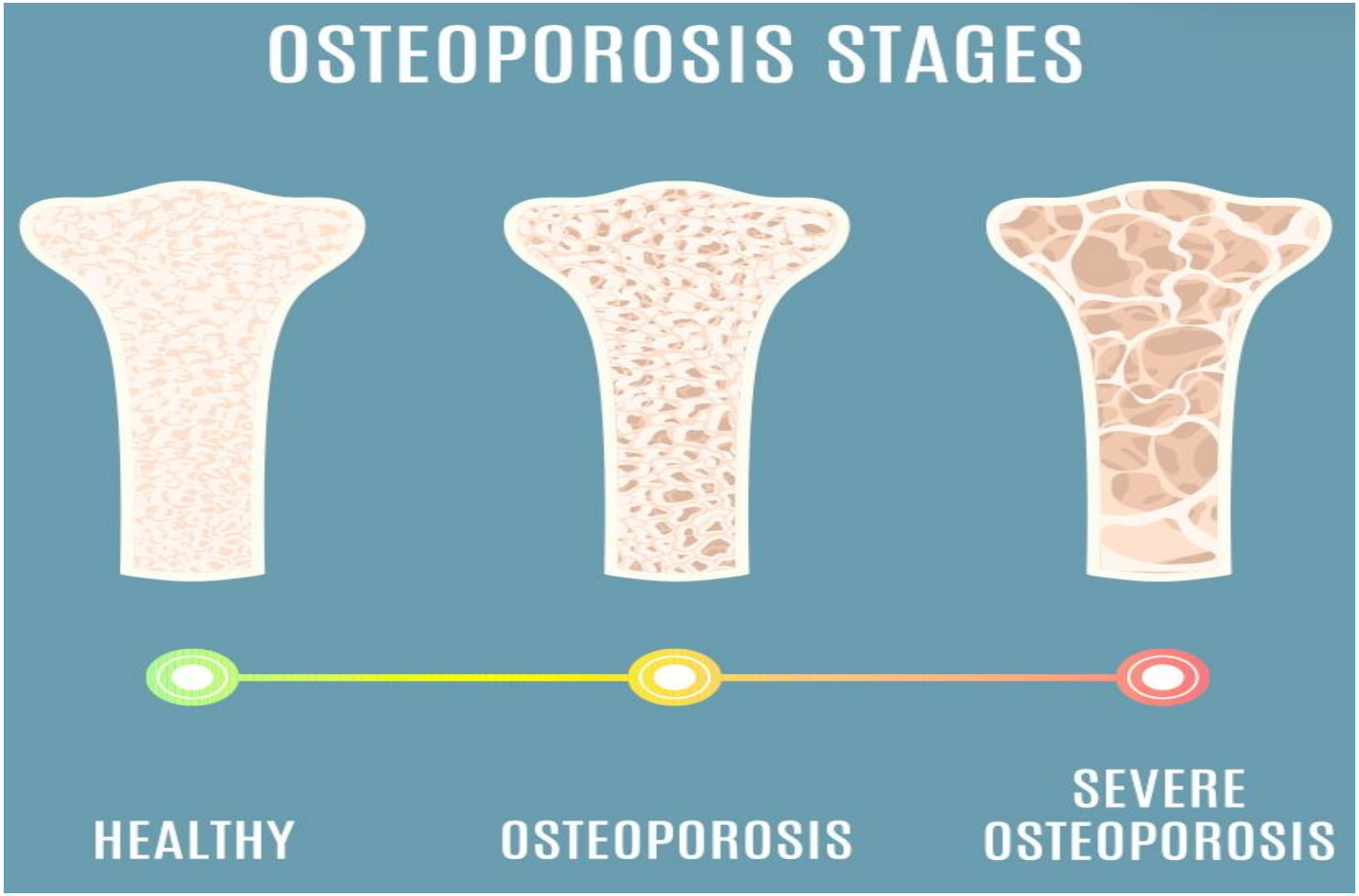
Metabolic disorders of the skeleton ;

- It affect bone as a tissue,so that all bones are involved histologically, although radiologic features are not always evident. Such diseases can be caused by genetic, endocrine, nutritional, or biochemical disorders.Osteoporosis is the most common metabolic bone disease . It is a *quantitative* abnormality of bone (“too little bone”), in contrast to rickets and osteomalacia, which are *qualitative* abnormalities of bone (reduced mineral-to osteoid ratio).

osteoporosis

In osteoporosis there is reduction in bone mass and altered trabecular structure. Bones become brittle and fracture with little or no trauma (insufficiency fractures).

Osteoporosis is defined as a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture.


OSTEOPOROSIS STAGES
HEALTHY
OSTEOPOROSIS
SEVERE OSTEOPOROSIS

Causes of Primary Osteoporosis

- Idiopathic juvenile Osteoporosis
- Postmenopausal
- Senile
- Osteogenesis imperfect

Causes of Secondary Osteoporosis

Endocrine

Glucocorticoid excess/Estrogen/testosterone deficiency / Hyperthyroidism/Hyperparathyroidism/Growth hormone deficiency (childhood onset)

Nutritional

Intestinal malabsorption/Chronic alcoholism/Chronic liver disease Partial gastrectomy/Vitamin C deficiency (scurvy)

Hereditary

Homocystinuria/Marfan syndrome/Ehlers-Danlos syndrome

Hematologic

Sickle cell disease/Thalassemia/Gaucher disease

Others

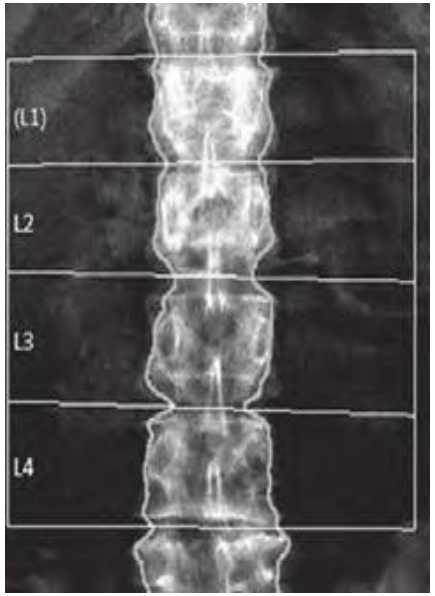
Rheumatoid arthritis/Ankylosing spondylitis/Systemic sclerosis Hemochromatosis/Long-term heparin therapy

Causes of Regional Osteopenia :

- Disuse osteoporosis
- Reflex sympathetic osteodystrophy (Sudeck atrophy)
- Regional migratory osteoporosis
- Periarticular osteoporosis (of inflammatory arthritis)

Regional osteoporosis: hand radiograph in early RA, showing periarticular osteopenia at the MCP and IP joints, with joint space narrowing and juxta-articular erosions. The periarticular osteopenia is the earliest radiographic feature of RA and is related to hyperemia, synovial inflammation, and local cytokines that stimulate osteoclastic bone resorption

Diagnosis of osteoporosis





Dual-energy X-ray absorptiometry (DXA) provides "areal" bone mineral density (BMD) (g/cm2) and is currently the **gold standard for diagnosis of osteoporosis by bone densitometry** (**normal** T score -1 and above, **osteopenia** between -1 and -2.5 ,**osteoporosis** T score −2.5 or below, 2.5 ,**severe osteoporosis** T score −2.5 or below and presence of at least one fragility fracture) . (A) PA **lumbar spine** (L1-4) or (B) **hip** (femoral neck or total). C, DXA of the **whole body** can provide information on total and regional BMD and body composition (fat and muscle mass).