Musculoskeletal system

Osteoporosis or porous bone is a chronic progressive metabolic bone disease characterized by low bone mass. The more common in women than men for several reasons.

Reasons

Female gender, low body weight, white or Asian ethnicity, current cigarette smoking, sedentary lifestyle, postmenopausal (estrogen deficiency), family history of osteoporosis, **diet low in calcium or vitamin D** deficiency, excessive use of alcohol, low testosterone level in men, **long term use of corticosteroid, heparin**, long acting use of sedatives or anti-seizure medications.

Osteoporosis occurs most commonly in the bones of spine, hips and wrists.

Best diagnostic test: **DXA test.**

Interventions:

Adequate calcium intake (1000mg/day in premenopausal women and postmenopausal women taking estrogen).

1500mg/day for those who are not taking estrogen supplements but are in menopausal stage.

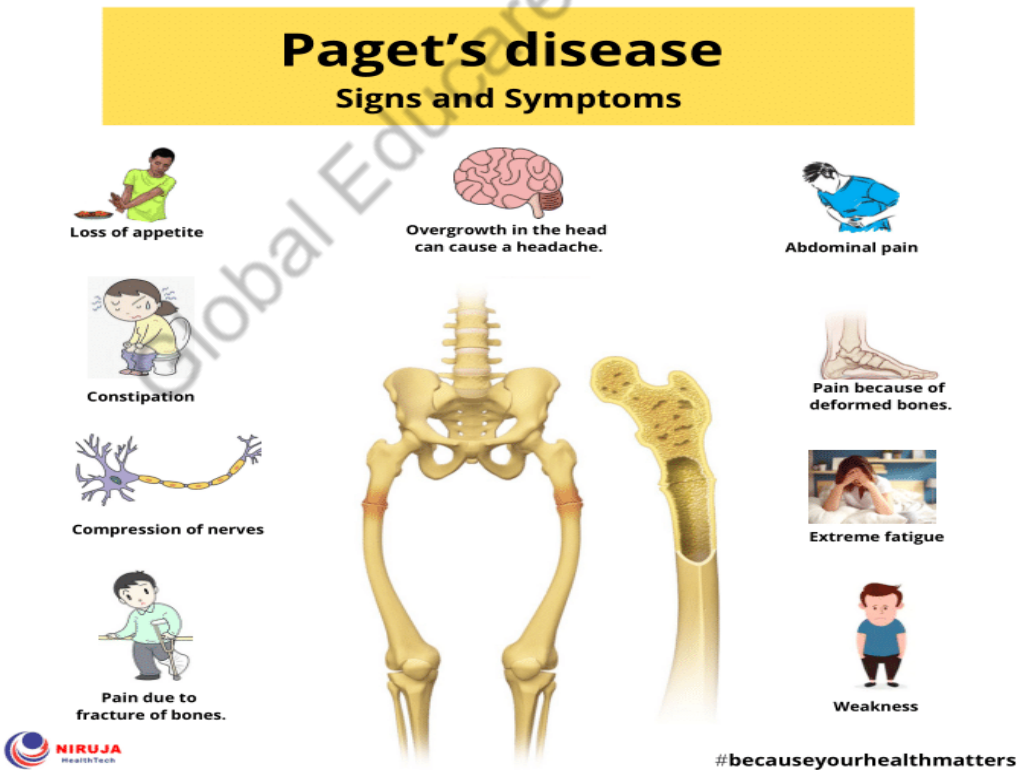
Bisphosphonates drugs (Example: ……?).

Zoledronic acid: OD/ Annually can prevent osteoporosis for 2 years after a single infusion.

Paget's disease

Is a chronic skeletal bone disorder in which excessive bone resorption is followed by excessive replacement of normal marrow by vascular, fibrous connective tissue.

Clinical manifestations:



Bone pain, fatigue and progressive development of waddling gait. Patient may complain that they are becoming shorter or that their heads are becoming larger, headache, dementia, visual defects and loss of hearing can result with an enlarged, thickened skull.

Same treatment like osteoporosis.

Salmon calcitonin can also be used as a subcutaneous or IM injection for treating Paget's disease. Discourage activities such as lifting and twisting. Good body mechanics are essential.

Rheumatoid arthritis (RA)

Is a chronic, systemic autoimmune disease. Although the exact cause is unknow. It probably results from a combination of genetics and environmental triggers.

Clinical manifestations:

Fatigue, anorexia, weight loss and generalized stiffness, pain, limitation of motion and signs of inflammation: heat, swelling and tenderness. Rheumatoid nodules, sjogren's syndrome and felty syndrome.

The patient characteristically experiences joint stiffness after periods of inactivity.

Morning stiffness may lasts from 60 minutes to several hours or more, depending on disease activity.

Medical management: DMARDs…….?

Steroid therapy, balance of rest and activity with joint protection, heat and cold applications can help prevent heat, pain and spasms. Moist heat is a better preventive measure for chronic stiffness.

Gout

Two types:

Primary Gout: hereditary error of Purine metabolism leads to the over production or retention of uric acid.

Secondary Gout: May be related to another acquired disorder or may be the result of drugs known to inhibit uric acid excretion.

Causes: Obesity in men increases the risk, hypertension, diuretic use and excessive alcohol consumption. A diet high in purine rich food will not cause gout, but can trigger an acute attack if a person is susceptible to gout.

Sign and symptoms: Inflammation of the great toe (Podagra).

Medical management: **Colchicine and NSAIDS**. **Allopurinol** which blocks the production of uric acid. **Probenecid** inhibits renal tubular reabsorption of urates.

Bed rest may be appropriate with affected joints properly immobilized.

Lyme disease

Is a spirochetal infection caused by Borrelia burgdorferi and transmitted by the bite of an **infected deer tick.**

The peak season for the human infection is the summer months.

Clinical symptoms

Erythema migrans (EM), a skin lesion (bull's eye rash" that occur in 70-80% of people at the site of the tick bite within 3-30 days.

Acute flu like symptoms such as low grade fever, chills, headache, stiff neck, fatigue, swollen lymph nodes and migratory joint and muscle pain are also present.

Medical management

Doxycycline: given within 3 days after the bite of deer.

Discourage deer, wear long pants or nylon tights of tightly woven, light colored fabrics so tick can be easily seen.

Tuck pants into boots or long socks, wear long sleeved shirts tucked into pants and wear closed shoes when hiking.

Spray insect repellent containing **DEET sparingly** on skin or apply **permethrin** to boots.

Remove attached ticks with tweezers not fingers. Grasp tick's mouth parts as close to skin as possible and gently pull straight out. Do not twist or jerk. Avoid folk solutions such as painting the tick with nail polish or petroleum jelly.

Save the tick in a bottle of alcohol (if you need it latter for identification).

Wash bitten area with soap and water and apply antiseptic wash hands.

Ankylosing spondylitis

Is a chronic inflammatory disease that primarily affects the sacroiliac joints.

Best game: table tennis.

Cauda equine syndrome

Compression of the nerves at the end of the spinal cord) can also result, contributing to lower extremity weakness and bladder dysfunction.

Later sign: “Bamboo spine”. NSAIDs and salicylates are commonly prescribed.

Best intervention: Swimming and racquet games are encouraged.

Systemic lupus erythematosus (SLE)

Is a multisystem inflammatory autoimmune disease. SLE typically affects the skin, joints and serous membranes (pleura, pericardium) along with renal, hematologic and neurologic systems.Wome are 10 times more likely than men to develop SLE.

Sun exposure and sun burns are the most common environmental triggers.

The classic butterfly rash over the cheeks and bridge of the nose occurs in 50% of patients with SLE. Malar rash, discoid rash,

Avoidance of physical and emotional stress.

Avoid to use drying soaps use mild body soap. Use of sun screen protection at least SPF 15 and protective clothing with minimal sun exposure from 11:00am to 3:00pm. Oral ulcers, renal, hematological and neurological disorders

Medical management

Anti malarial agents such as hydroxychloroquine and chloroquine are often used to treat fatigue and moderate skin and joint problems.

Scleroderma (systemic sclerosis)

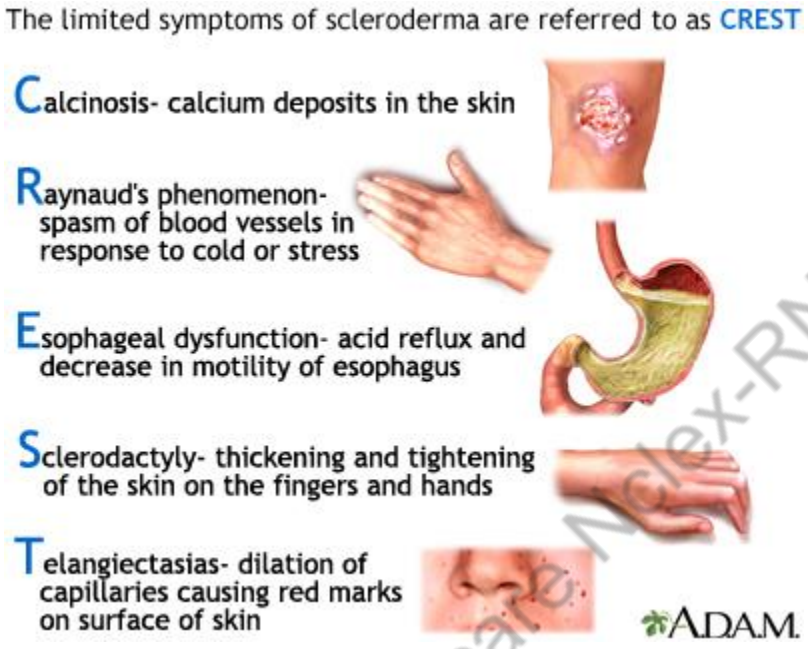
Is a disorder of connective tissue characterized by fibrotic, degenerative and occasionally inflammatory changes in the skin, blood vessels, skeletal muscles and internal organs.

Exact cause is unknown. Immunological and vascular abnormalities are suspected. In scleroderma, collagen (protein that gives normal skin it’s strength and elasticity) is overproduction. Excessive production of collagen leads to progressive tissue fibrosis and occlusion of blood

vessels. Proliferation of collagen disrupts the normal functioning of internal organs such as lungs, kidney, heart and GI track.

Clinical manifestations

Calcinosis, Raynaud's phenomenon, esophageal dysfunction, sclerodactyly and telangiectasia, sjogren's syndrome.



Pulmonary artery hypertension and interstitial lung disease may occur.

Interventions

Instruct patient with scleroderma not to have finger stick blood testing done, because of compromised blood circulation and poor healing of the fingers.

Mouth excursion (yawning with open mouth) is a good exercise to help with temporomandibular joint function.

Protect the skin from cold exposure and possible burns or cuts that might heal slowly. Smoking should be avoided.

Sprain

Ligament damage.

Strain: is an excessive stretching of a muscles, it's fascial sheath, or a tendon. Most strains occur in the large muscle groups, including the lower back, calf and hamstrings.

Prevention: Warming up muscles before exercising. If an injury occurs, the immediate care focuses on **"RICE".**

Stopping the activity and limiting movement. Applying ice compresses to the injured area. Compressing the involved extremity. Elevate the extremity. Provide analgesia as necessary.

Ice is most useful when applied immediately after the injury has occurred. Ice application should not exceed 15-20 minutes per application and ice should not be applied directly to the skin.

Elastic compression bandage can be wrapped around the injured part. To prevent edema and encourage fluid return, wrap the bandage starting distally to proximally.

The bandage can be left in place for 30 minutes and then removed for 15 minutes. Mild analgesics and NSAIDs may be necessary to manage patient discomfort.

Carpal tunnel syndrome

Is a condition caused by compression of the median nerve, which enters the hand through the narrow confines of the carpal tunnel.

The syndrome is associated with hobbies or occupations that require continuous wrist movement. Example: musicians, carpenters, computer, operators.

Women are more likely to develop CTS due to smaller carpal tunnel as compared to men.

Clinical manifestations

Weakness, pain, numbness or impaired sensation in the distribution of the median nerve. Shaking the hands often relieves these symptoms.

Collaborative care: the patient with CTS is directed toward relieving the underlying cause of the nerve compression.

Rotator cuff injury

Injury of the shoulder while falling (especially overhead arm motions).

Diagnostic test: Drop arm test.

Patient with the partial tear or cuff inflammation may be treated conservatively with rest, ice and heat, NSAIDs, steroid injection into the joint, ultrasound and physical therapy.

Fracture

Is a disruption or break in the continuity of the structure of bone.

Open fracture: skin is broken, exposing bone and causing soft tissue injury.

Closed fracture: skin has not been ruptured and remains intact.

Complete fracture: if the break is completely through the bone.

Incomplete fracture: if the fracture occurs partly across the bone shaft.

Clinical signs: localized pain, decreased function and inability to bear weight on or use the affected part. If the **fracture is suspected, the extremity is immobilized in position in which it is found.**

Green stick fracture

Communicated fracture

Compartment syndrome

Six Ps are characteristics of compartment syndrome

Pain, pressure, paresthesia, paralysis, pulselessness and pallor.

Interventions: elevation of the extremity may lower venous pressure and slow arterial perfusion. Therefore, the extremity should not be elevated above the heart level.

The application of cold compresses may result in vasoconstriction and exacerbate compartment syndrome.

It may be necessary to remove or loosen the bandage and split the cast in half.

Fasciotomy.

Fat emboli syndrome

It is characterized by the pressure of systemic fat globules from fractures that are distributed into tissues and organs after a traumatic skeletal injury. Most common with the fracture of the long bone, ribs and pelvis.

Fat emboli in the lungs causes the “ **Hemorrhagic interstitials pneumonitis”**

Sign and symptoms of ARDS: chest pain, tachypnea, cyanosis, dyspnea, apprehension, tachycardia, decreased PaO2, confusion. Change in LOC, petechia around neck, chest, axilla, mouth and eye conjunctiva.

Chest X-ray: **Snowstorm.**

Treatment: Fluid, O2, change position, cough and deep breathing.

Points to remember

Buck's : hip fracture

Russell's: Femoral fracture

Pin site care: sterile technique, remove crusts as they will grow bacteria

Complication of fracture: Osteomyelitis

Hip fracture: trochanter rolls to prevent external rotation.

Phantom limb pain: any painful sensation that are referred to the absent limb. Begins immediately after surgery.

Rehabilitation:

To fit the prosthesis: limb shaping

No weight wearing on new stump.

Massage the stump to promote circulation and decrease tenderness.

How to toughen the stump?

Press into soft pillow. Then a hard pillow. Then a bed. Then a chair

Instruct patient to wear a compression bandage at all the times.

Crutches

2-3 finger widths below anterior axillary fold to a point lateral to and slightly in front of foot.

Types of gait

2-point gait, 3-point gait, 4-point gait

Stairs: Up with the good, down with the bad”

Canes: cane opposite affected leg, advance cane with the weak side for a wide base of support.