

Week 7 & 8: Neurological and Musculoskeletal disorders

Osteoporosis- Postmenopausal osteoporosis occurs in middle-aged and older women and is caused by increased osteoclast activity (probably caused by changes in osteoprotegerin), decreased IGF levels, a combination of inadequate dietary calcium intake and lack of vitamin D

Decreased levels of estrogen and testosterone, reduced physical activity lessens muscle stress on bone, inadequate vitamins C and D, insufficient dietary magnesium and calcium, corticosteroid use

Osteomyelitis- Osteomyelitis is a bone infection caused most often by bacteria (e.g., *S. aureus*) that can enter bone from outside the body (exogenous osteomyelitis) or from infection sites within **the body** (hematogenous osteomyelitis)

Most often a staphylococcal infection, contaminated open wound, or hematogenous bone infection.

Acute inflammation of marrow and cortex; impaired blood supply leads to necrosis that forms a sequestrum and an involucrum that surrounds the infected bone

Myelomeningocele - Myelomeningocele, or spina bifida cystica, is a herniation of the meninges, spinal fluid, a portion of the spinal cord, and nerves through a vertebral defect; 80% are located in the lumbosacral region. The Arnold-Chiari malformation is a serious association with myelomeningoceles that displaces the cerebellar tonsils downward and can result in cysts within the spinal cord.

Seizures- during infancy and childhood may be the result of asphyxia, intracranial bleeding, CNS infection, fever, electrolyte imbalance, or inborn errors of metabolism. Febrile seizures between ages 6 months and 5 years are usually benign. Many seizure disorders are idiopathic, having no known cause. Epilepsy is a neurologic condition characterized by a predisposition to recurrent seizures. The incidence of epilepsy varies greatly with age and likely occurs during infancy or childhood in 0.5% to 1% of children; the incidence decreases with age.

A seizure is a sudden, explosive disorderly discharge of cerebral neurons and is characterized by a sudden, transient alteration in brain function, usually involving motor, sensory, autonomic, or psychic clinical manifestations and an alteration in one's level of arousal. The alteration in level of arousal is temporary. Among the causes of seizure activity are the following: metabolic defects motor syndromes congenital malformations infections genetic predisposition brain tumors perinatal injury vascular diseases postnatal trauma fever

Partial seizures (unilateral) were previously termed jacksonian or psychomotor seizures. They are now classified as simple, complex, or secondary. Simple are without impairment of consciousness, but have somatosensory, autonomic, psychic symptoms. Complex seizures have impaired consciousness with or without automatism. Secondary seizures evolve into generalized tonic-clonic seizures.

Generalized seizures (bilateral) were earlier termed petit-mal or grand mal. They are now classified as absence, myoclonic, clonic, or tonic-clonic. An aura is a sensation, such as a light, a taste, warmth, or a sound, that precedes a generalized seizure. A prodroma is a set of early manifestations, such as malaise or headache, that may precede the onset of a seizure.

Spinal cord injuries- Spinal cord injuries occur most often as a result of vertebral injuries. Traumatic forces injure the vertebral or neural tissues by compressing the tissue, pulling or exerting traction on the tissue, or shearing tissues so that they slide into one another

Ankylosing spondylitis- . is characterized by stiffening or fusion of the spine

is a chronic, inflammatory joint disease characterized by stiffening and fusion or ankylosis of the spine and sacroiliac joints.

common symptoms of early ankylosing spondylitis are low back pain and stiffness

Autonomic hyperreflexia- Autonomic hyperreflexia (dysreflexia) is a syndrome of sudden massive reflex sympathetic discharge associated with spinal cord injury at level T5-T6 or above and can cause life-threatening hypertension.

Duchenne Muscular dystrophy- The most common and severe of all X-linked recessive disorders is Duchenne muscular dystrophy, which affects males. This disorder is characterized by progressive muscle degeneration; individuals are usually unable to walk by age 10 or 12. The disease also affects the heart and respiratory muscles, and death due to respiratory or cardiac failure may occur before age 20 years. These cases result from an absence of dystrophin, without which the muscle cell cannot survive, and muscle deterioration follows.

Pathological fractures- A broken bone caused by disease, often by the spread of cancer to the bone.

More than 80% of pathologic fractures occur in patients with breast (50%), kidney, lung, or thyroid cancer. Approximately 10% to 30% of pathologic fractures that occur in long bones where a metastatic lesion is present require surgical intervention

Inflammatory joint disease - Noninflammatory joint disease is differentiated from inflammatory joint disease by the absence of synovial membrane inflammation, the absence of systemic signs and symptoms, and the presence of normal synovial fluid

Guillain Barre syndrome- a rare demyelinating disorder caused by an antibody and cell mediated immunologic reaction directed against peripheral nerves that cause weakness or paralysis and can have irreversible effects. Different subtypes have been identified, and clinical manifestations depend on the subtype. **Usually preceded a viral infection**

Legg-Calvé-Perthes disease - Legg-Calvé-Perthes disease is one of the most common osteochondroses. This disorder is characterized by epiphyseal necrosis or degeneration of the head of the femur followed by regeneration or recalcification

Heat Stroke-Heatstroke is a condition caused by your body overheating, usually as a result of prolonged exposure to or physical exertion in high temperatures. This most serious form of heat injury, heatstroke, can occur if your body temperature rises to 104 F (40 C) or higher. The condition is most common in the summer months.

Heatstroke requires emergency treatment. Untreated heatstroke can quickly damage your brain, heart, kidneys and muscles. The damage worsens the longer treatment is delayed, increasing your risk of serious complications or death.

Heatstroke signs and symptoms include:

- **High body temperature.** A core body temperature of 104 F (40 C) or higher, obtained with a rectal thermometer, is the main sign of heatstroke.
- **Altered mental state or behavior.** Confusion, agitation, slurred speech, irritability, delirium, seizures and coma can all result from heatstroke.
- **Alteration in sweating.** In heatstroke brought on by hot weather, your skin will feel hot and dry to the touch. However, in heatstroke brought on by strenuous exercise, your skin may feel dry or slightly moist.
- **Nausea and vomiting.** You may feel sick to your stomach or vomit.
- **Flushed skin.** Your skin may turn red as your body temperature increases.
- **Rapid breathing.** Your breathing may become rapid and shallow.
- **Racing heart rate.** Your pulse may significantly increase because heat stress places a tremendous burden on your heart to help cool your body.
- **Headache.** Your head may throb

Myelin - A myelin sheath around selected axons forms an insulation that allows quicker nerve impulse conduction, referred to as saltatory conduction. Changes with age

CVA- Cerebrovascular disease causes (a) ischemia with or without infarction and (b) hemorrhage. The common clinical manifestation is a cerebrovascular accident (CVA) or stroke syndrome. Hypertension is the greatest risk factor followed by other preventable risks

- CVAs are classified according to the pathophysiology and include ischemic (thrombotic, embolic, and hypoperfusion), lacunar (small vessel disease), and hemorrhagic strokes.
- An **ischemic stroke** occurs when blood clots or other particles block the blood vessels to the brain. Fatty deposits called plaque can also cause blockages by building up in the blood vessels. **An ischemic stroke occurs when a blood vessel supplying the brain becomes blocked, as by a clot**
- **hemorrhagic strokes** - An emergency condition in which a ruptured blood vessel causes bleeding inside the brain.
 - High blood pressure and trauma are two leading causes. Taking blood-thinning drugs may also increase a person's risk.
 - Symptoms can vary based on the location of the hemorrhage in the brain, but may include numbness or weakness in part of the face, difficulty speaking, or difficulty walking.
 - Emergency treatment is needed for cerebral hemorrhage. It usually involves medications and close monitoring in an intensive care unit. In rare cases, surgery may be needed to relieve pressure around the brain.
- **TIA** - A transient ischemic attack is a transient episode of neurologic dysfunction resulting from focal cerebral ischemia with risk for progressing to stroke
- The blockage in the blood vessels responsible for most TIAs is usually caused by a blood clot that's formed elsewhere in your body and travelled to the blood vessels supplying the brain. It can also be caused by pieces of fatty material or air bubbles
 - A brief stroke-like attack that, despite resolving within minutes to hours, still requires immediate medical attention to distinguish from an actual stroke.
 - A transient ischemic attack may be a warning sign of a future stroke.
 - Symptoms include weakness on one side of the body, vision problems, and slurred speech. These are transient and often resolve within 24 hours.
 - Treatment includes medication, surgery, and healthy lifestyle changes.