NR577 Final Exam Study Guide for Weeks 5-8

If you understand the concepts below and how to diagnose, treat, and manage, you will be successful on the Final exam.

Week 5: Musculoskeletal and Neurological Disorders

Musculoskeletal Disorders

- Scoliosis

- Patellofemoral stress syndrome

Patellofemoral overuse syndrome occurs during running and sports that involve repetitive stress in the lower extremity. The athlete presents with activity-related pain in the anterior knee. In young athletes, it is occasionally associated with swelling and crepitus of the knee joint.

Evaluation of these injuries is comprehensive and requires a "top-down" evaluation of the athlete's leg from the hip to the foot. Most athletes with this condition, regardless of level or physical condition, typically have hip/core weakness that results in altered knee biomechanics. A comprehensive evaluation of hip alignment and rotation, muscle development, tightness in the hamstrings and IT band, and foot mechanics is necessary to fully understand and treat the cause of this disorder. Most athletes with this complaint often have a multifactorial cause for their symptoms.

Treatment should be geared toward identifying the cause. Often, athletes are overtraining and need to modify current activities. Cross-training may help. Addressing hip and pelvic stability is now a mainstay of treatment for this disorder. Stretching and strengthening of the hamstrings and quadriceps are recommended. The use of braces providing proprioceptive feedback during competition is controversial.

- Growing Pains

"growing pains" of presumed bone and joint origin of children.
Growing pains, a common cause of leg pain in childhood, are characterized by poorly localized pain at night, which frequently wakes the child from sleep; no objective signs of inflammation; and no daytime symptoms. Patients with growing pains often ask to be massaged, which is not typical of those with arthritis.

- Shin splints

The term *shin splints* is widely used for shin pain, but it is not a diagnostic term. A more specific diagnosis should be made if possible. Shin splints usually occur in the beginning of training after a relatively inactive period. The pain and tenderness are located over the anterior compartment and disappear in 1 to 2 weeks as the athlete becomes conditioned to the exercise. Care must be taken to differentiate shin splints from stress fractures of the tibia, which cause more localized pain and have many more potential complications if not cared for properly.

- Osgood-Schlatter disease (OSD)

active adolescents during growth spurts, ages of 9 and 15 when the tuberosity has not yet been ossified

area is not hard enough to resist traction of the patellar ligament, common in young adolescents who play sports requiring repetitive quadriceps contractions, such as basketball, soccer, or figure skating

overuse syndrome that presents with pain, tenderness, and edema to the affected knee.

typically resolves by itself as ossification of the tuberosity continues as the child grows.

S i g n s a n d S y m p t o m s

- pain worsened by activity such as running, jumping, squatting, using stairs
- palpable lump below the knee
- localized erythema, swelling, and tenderness
- may be unilateral or bilateral

Treatment for Osgood-Schlatter disease includes:

- anti-inflammatory medication (ibuprofen) to reduce pain and swelling
- stretching, flexibility, and physical therapy exercises for the thigh and leg muscles
- surgery may be required for persistent pain or progressive disease
- RICE (rest, ice, compression, elevation) may be helpful to manage pain and inflammation

Neurological Disorders

- EEG

a patient with suspected epilepsy, the presence of seizure activity during the EEG establishes the diagnosis.

The absence of seizure activity does not exclude the diagnosis of a seizure disorder since focal seizures can originate from areas of the cortex that cannot be detected by scalp electrodes.

It is often difficult to obtain an EEG during a seizure. Procedures may be used to provoke abnormal activity:

- hyperventilation
- photic stimulation
- sleep deprivation on the night prior to the EEG

- Seizures

1. Simple partial seizures

Focal seizures are classified by whether there is preserved awareness (formerly called simple partial seizures) or impaired awareness (formerly called complex partial seizures), and whether the first manifestation is a motor feature or not.

In focal seizures, the seizure is confined to one area of the brain. It usually involves just one hemisphere or one small part of a hemisphere. The symptoms are dependent upon the area of the brain affected as well as the spread of the seizure. If the focal seizure is confined to the motor area of the brain, the symptoms produced are the muscle jerking in one area. Some patients also exhibit turning of the head to one side. If the focal seizure occurs in the vision part of the brain, the symptoms are usually flashings of light which are only perceived by the patient. If the focal seizures occur in the auditory cortex, the patient will perceive a ringing sound in the ear. If it occurs in the sensory area of the brain, it is perceived as false touch sensations.

Focal seizures without dyscognitive features: there is no impairment of consciousness. The patient remains conscious during the seizure and able to interact normally with the surroundings. These were previously classified as simple partial seizures.

Focal seizures with dyscognitive features: there are marked impairment of consciousness without loss of consciousness. The patient appears to be awake but does not interact or answer questions. These were previously classified as complex-partial seizures.

2. Grand mal seizures

Major motor seizure—grand mal

Consciousness is lost without warning and the patient is amnestic for the event. Except for the absence of any evidence of focal onset, the seizure is identical to a secondary generalized seizure.

3. Anti-epileptic/Seizure medications

The American Academy of Neurology (2015) provides guidelines on the decision to initiate AED treatment. Immediate AED treatment after a first unprovoked seizure should be based on individualized patient assessments that account for the risk for seizure recurrence against the adverse effects of AED therapy. Patient preferences should also be considered. Patients should be advised that immediate treatment will not improve the long-term prognosis for seizure remission but will reduce the seizure risk over the subsequent 2 years. Provoked seizures should initially be treated based on the underlying cause.

Phenytoin should be monitored for therapeutic drug levels. Creatinine, CBC, and liver function should be monitored annually. The patient should also receive regular dental exams.

Valproic acid and its derivatives can cause leukopenia, thrombocytopenia, and hepatotoxicity. Monitor CBC and LFTs every 3 months for 1 year and then annually.

Carbamazepine can cause blood dyscrasias, hepatotoxicity, and renal failure. Draw CBC, LFT, and renal function every 3 months for 1 year and then annually.

- Headaches (Tension, Cluster, Migraine)
- **S**-systemic signs and disorders (fever, malignancy, pregnancy, thrombotic therapy)
- **N**-neurologic symptoms (loss of consciousness, seizure)
- **O**-onset new or changed and patient > 50-years-of-age
- **O**-onset in thunderclap presentation
- **P**-papilledema, pulsatile tinnitus, positional provocation, precipitated by exercise

Post-Concussion Syndrome- A concussion is a mild traumatic brain injury that affects normal brain function. It occurs as a result of a direct or indirect blow to the head.

Signs and symptoms of concussion may be subtle and may appear immediately or even hours after impact. S/S include:

- Headache, drowsiness, dizziness, sensitivity to light, memory difficulties, difficulty concentrating, feeling slowed down

Typically, patients with a concussion present without abnormalities on a neurologic physical exam

T r e a t m e n t

Patients should be observed for at least 48 hours for worsening signs that include:

- loss of consciousness
- increasing headache, repeated vomiting, slurred speech, confusion, unusual behaviors, seizures, limb weakness or numbness

The presence of any worsening symptoms requires emergency care.

Concussions usually resolve on their own within 2-4 weeks with proper physical and cognitive rest. During recovery, the brain is much more vulnerable to further insult. Any activity that has the potential to cause another impact should be avoided. A repeated injury while the brain is recovering may exacerbate symptoms and result in permanent brain damage.

athletes who are at risk for developing a concussion and initiate appropriate prevention and treatment strategies:

Before activity

- Complete preparticipation sport evaluation using graded symptom and clinical sign checklists to establish a baseline.
- Reinforce safety gear and safe practice for sports.

Immediately after injury

- Conduct serial assessments since signs and symptoms may not appear for minutes to hours after the injury or may evolve over time.
- Apply guidelines for assessment and management that support the use of a multidisciplinary approach including qualified sports medicine specialists.
- Use the Balance Error Scoring System (BESS) assessment tool at the sideline to objectively assess balance after a concussion.

Return to play/school

- Approval of unrestricted return-to-play should be made by the team physician or other medically qualified individual. A step-wise approach is recommended:
    - symptom-limited activity