Preconference Form

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Medical Diagnosis/Disease: Osteoarthritis and THA

NCLEX IV *(8)*: **Physiological Integrity/Physiological Adaptation**

Anatomy and Physiology
Normal Structures

Composed of voluntary muscle and 6 types of connective tissue: Bone, cartilage, ligaments, tendons, fascia, and bursae. The purpose is to protect body organs, provide support/stability, store minerals, and allow coordinated movement.

Bone: Main function is to support, protect organs (like rib cage protects heart) voluntary movement, blood cell production and mineral storage. Keep body from collapsing, allowing it to bear weight. Serve as point of attachment for muscles & ligament. Muscles connect to bones by tendons and act as a lever. Ligaments provide stability to joints. Bone marrow contains tissues that make red and white blood cells. Bones are also a storage site for inorganic minerals like calcium & phosphorus. Bone is constantly changing form and composition. It has both organic material (collagen) and inorganic (calcium, phosphate). Internal and external growth and remodeling are ongoing process forever.

Bones have structure is made of dense connective tissue and have both an outer (cortical or compact) and inner spongy layer (trabecular or cancellous) that is filled with red or yellow marrow. Blood reaches the bones by passing through spaces in the marrow.

Bone structure: Epiphysis (stability), diaphysis (structural support, for bending and twisting) and metaphysis. Epiphyseal plate (growth plate). Periosteum covers the bone.

Three types: Osteoblasts (make organic bone matrix(collogen), osteocytes (mature bone cells), and osteoclasts (bone remodeling by breaking down bone tissue)

Bone remodeling is removal of old bone by osteoclasts, and deposit of new by osteoblasts.

Joints: Where two bones meet and types: Fibrous (immovable), cartilaginous (partially moveable) & synovial (freely moveable) that

Pathophysiology of Disease

A degenerative joint disease from a gradual loss of articular cartilage and formation of osteophytes (bony growths) at joint margins. Non inflammatory of the synovial joints unlike inflammatory arthritis.

Articular cartilage that covers the ends of the bone that typically provide a smooth friction free environment for movement, becomes dull, yellow, granular, softer, and less elastic. Over time the cartilage breaks down causing fissuring, erosion, and exposure of the subchondral bone. When the cartilage wears off the synovial membrane gets irritated leading to mild synovitis leading to increased synovial fluid production causing edema. When the cartilage breaks down, the underlying bone thickens and forms osteophytes (spurs) at the joints edges leading to deformity and loss of ROM in in the joints. The bone may develop cysts also and microfractures due to the increased stress. Typically affects weight bearing joints like hips, knees, and lumbar and cervical spine. It can also impact the hands specifically the distal interphalangeal and the proximal interphalangeal.

THA: Goal is to alleviate pain, restore mobility, and improve quality of life of pt with hip joint disease who have not responded to conservative treatments like medications, physical therapy, and joint injections.

Damaged portions of the hip joint are removed and replaced with prosthetic components. There are two:

Acetabular Component- the damaged cartilage and bone of the hip socket (acetabulum) are removed and replaced with a metal or plastic socket.

Femoral component: The head of the femur (thigh bone) is removed, and a metal stem with a prosthetic ball is inserted into the femoral canal.

Both may be cemented in place or cementless

NCLEX IV *(7)*: **Reduction of Risk**

Anticipated Diagnostics

Labs:

Rheumatoid Factor
ESR (Synovitis)
C- Reactive Protein
BMP or CBC

Additional Diagnostics

Synovial Fluid Aspiration
X ray
MRI
CT
Bone scan
Ultrasound
Arthroscopy
DEXA

have joint capsule, synovial membrane and cartilage to reduce friction.
Joints facilitate movement and flexibility. Synovial fluid in synovial joints act as lubricant, while cartilage prevents bones from rubbing against each other.
Muscles: Made of fibers that contain proteins (actin & myosin) that are essential for contraction. They attach bones via tendons. Function is to contract and relax to produce movement. Also help maintain posture, heat, and stabilize joints. Contraction is Regulated by the nervous system and requires adequate blood flow for oxygen and nutrient delivery.
Types: Cardiac (striated, involuntary, only in heart), smooth (nonstriated, involuntary, hallow structures like airways, arteries, GI, bladder), and skeletal (striated, voluntary, has sarcomere that is the contractile unit of myofibril that has myosin and actin sliding past one another).
Skeletal muscle contractions: posture Maintenace, body movement, facial expressions. Has Isometric (increase tension in muscle but no movement) and Isotonic (shortened muscle to produce movement).
Skeletal muscle fibers: Slow twitch (prolonged activity like marathon running) and fast twitch (rapid muscle contraction like eye blinking)
Cartilage: 3 types: Hyaline (most common, collagen fibers found in trachea, bronchi, nose) elastic (collagen & elastic, flexible, ear, epiglottis, larynx), and fibrous (collagen, shock absorber, in-between vertebral discs, and provides cushion between bones of pelvic, knee, shoulder)
Skeletal muscle requires nerve impulse to contract. Nerve fiber and skeletal muscle fibers called motor endplate. Junction between axon of the nerve and adjacent muscle cell is called neuromuscular junction. Presynaptic neurons release acetylcholine (neurotransmitter), and it diffuses across neuromuscular junction to bind with receptors on the motor endplate of the muscle. In response the sarcoplasmic reticulum releases calcium into the cytoplasm, and triggers contraction in the myofibrils. When calcium is low involuntary muscle contractions can occur.

relying on bone growth to secure the implant over time.
Performed over general anesthesia and is minimally invasive surgery.
Post op care: Pain management with analgesics, or NSAIDS, opioids. PT, early mobilization, wound care, and prevention of dislocation.

Direct energy source is ATP.
Ligaments & Tendons: Dense fibrous connective tissue, Tendons attach muscles to bones. Ligaments connect bones to bones and provide stability. They have poor blood supply, making their repair slow.
Fascia: Layers of connective tissue that can withstand stretching. Surrounds muscle bundles and provides strength and helps contraction.
Bursae: Small sacs of connective tissue lined with synovial membrane and contains fluid. At bony prominences or joint to relieve pressure and decrease friction when moving. Found between patella and skin, elbow and skin.
Periosteum: Connective tissue that Covers outside of bone

NCLEX II *(3)*: **Health Promotion and Maintenance**

NCLEX IV *(7)*: **Reduction of Risk**

<u>Contributing Risk Factors</u>
Age (natural wear and tear)
Previous joint injuries
Gender (Women)
Genetics
Obesity
Repetitive stress on joints
Lack of physical activity

<u>Signs and Symptoms</u>
Joint pain
Joint stiffness
Decreased ROM
Crepitus
Joint swelling and tenderness
Bone spurs
Joint deformity
Joint instability

<u>Possible Therapeutic Procedures</u>
<u>Non-surgical</u>
Physical Therapy
Occupational Therapy
Medications
Weight management
Braces/splints
Hot/Cold therapy
TENS
Acupuncture
Injections
Nutritional Supplements
<u>Surgical</u>
Total Hip replacement
Arthroscopic Surgery
Osteotomy
Arthrodesis
Partial Joint replacement
Cartilage Restoration
Synovectomy
Revision Joint surgery

<u>Prevention of Complications</u>
(What are some potential complications associated with this disease process)
Chronic Pain
Decreased mobility and joint function
Joint deformity
Muscle weakness
Increased Risk of falls
Sleep disturbances
Depression and anxiety
Impaired balance and gait
Disability

		Debridement	

NCLEX IV *(6)*: **Pharmacological and Parenteral Therapies**

<u>Anticipated Medication Management</u>

Acetaminophen, NSAIDS, Topical Analgesics, Corticosteroid injections, Opioid analgesics, muscle relaxants, dietary supplements.

NCLEX IV *(5)*: **Basic Care and Comfort**

<u>Non-Pharmacologic Care Measures</u>

Physical therapy, weight management, joint protection like assistive devices, heat and cold therapy, education and self management, acupuncture, dietary modifications

NCLEX III *(4)*: **Psychosocial/Holistic Care Needs**

<u>What stressors might a patient with this diagnosis be experiencing?</u>

Chronic pain, decreased mobility, loss of independence, depression, anxiety, impact on work, financial, fear of further joint damage, body image, sleep, limitation in physical activities

Client/Family Education

<u>List 3 potential teaching topics/areas</u>

Pain management strategies

Exercise and physical activity

Lifestyle modifications like diet and weight

NCLEX I *(1)*: **Safe and Effective Care Environment**

<u>Multidisciplinary Team Involvement</u>

(Which other disciplines do you expect to share in the care of this patient)

Primary care physician, physical therapist, occupational therapist, pain specialist, dietician or nutritionist, social worker, psychologist, podiatrist, pharmacist, surgeon