Preconference Form

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Medical Diagnosis/Disease: Osteoarthritis

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

Anatomy and Physiology

Normal Structures

The musculoskeletal system consists of bones, muscles, joints, cartilage, tendons, ligaments, and connective tissues, functioning together to provide support, movement, and protection for the body. The bones main functions are support, protect internal organs, voluntary movement, blood cell production, and mineral storage. Bone marrow contains the tissues responsible for making red and white blood cells. They can be classified by shape as long, short, flat, irregular, or sesamoid. Bones serves a point of attachment for muscles and ligaments. Muscles are connected to bones by tendons. Bones act as a lever for muscles. Movement occurs because of muscle contractions applied to these levers. Ligaments provide stability to joints. Joints can be classified by the degree of movement they allow. Diarthrodial are freely movable, amphiarthrosis are slightly movable, synarthrosis do not move. Each joint is enclosed in a capsule of fibrous connective tissue that joins 2 bones together to form a cavity. The capsule is lined by a synovial membrane, which secrets thick synovial fluid. The fluid lubricates the joint, reduces friction, and allows opposing surfaces to slide smoothly over each other. It supplies oxygen and nutrients to and removes carbon dioxide and metabolic wastes from the chondrocytes within articular cartilage. The end of each bone is covered with articular (hyaline) cartilage. There are 3 types of cartilage, hyaline (most common), elastic, and fibrous. Cartilage in synovial joints supports soft tissue and provides the articular surface for joint movement. It protects underlying tissues. Articular cartilage is avascular and must receive nourishment by the diffusion of material from the synovial fluid. Low direct blood supply contributes to the slow metabolism of cartilage cells and is why

Pathophysiology of Disease

Osteoarthritis, also known as degenerative joint disease, is a condition marked by the gradual breakdown of articular cartilage. It is a localized, nonsystemic disorder that is generally noninflammatory, except in specific cases. It was considered to be solely a wear-and-tear disease of aging, but is now understood as a process where new tissue forms in response to cartilage damage within the joint, though the rate of destruction surpasses repair. This leads to the erosion of cartilage and the underlying bone, along with the development of osteophytes (bone spurs), which narrow the joint space. These joint changes result in pain, stiffness, reduced mobility, muscle spasms, and occasional inflammation. In its early stages, OA may be challenging to differentiate from rheumatoid arthritis (RA).

The degeneration of articular cartilage begins with excessive mechanical stress or injury, which disrupts the balance between cartilage production and degradation by chondrocytes, the cells responsible for maintaining the extracellular matrix. Chondrocytes release matrix metalloproteinases and aggrecans, enzymes that break down collagen and proteoglycans, key components of the ECM. As cartilage thins and its structure weakens, it loses its ability to absorb shock and reduce friction, leading to further mechanical damage. Over time, the cartilage surface becomes irregular and may completely erode, exposing the underlying bone.

As cartilage deteriorates, the subchondral bone (the bone beneath the cartilage) absorbs increased stress, triggering a remodeling process. The bone becomes denser and undergoes subchondral sclerosis, a thickening that reduces its ability to act as a shock absorber. The bone also forms **osteophytes** (bone spurs) at the joint margins in an attempt to stabilize the joint. These bony outgrowths can cause pain, restrict joint movement, and

NCLEX IV *(7)*: Reduction of Risk

Anticipated Diagnostics

Labs

Erythrocyte sedimentation rate

High-sensitivity C-reactive protein

CBC- for NSAID use

BUN, creatinine

Renal and liver function tests

Synovial fluid analysis

Additional Diagnostics

-Radiographs (x-ray): to determine changes to joints

-CT scan and Magnetic resonance imaging: for examining knee joint and vertebrae

-H&P

healing and repair of cartilage tissue occurs slowly. Skeletal muscle is enclosed by a continuous layer of deep fascia called the epimysium. Within the muscle, connective tissue extends to form the perimysium, which encases bundles of muscle fibers, and the endomysium, which surrounds each individual fiber. The structural unit of skeletal muscle is the muscle fiber, a highly specialized, multinucleated cell designed for contraction. Muscle fibers contain numerous mitochondria to support their high energy demands and are made up of myofibrils, which consist of protein filaments. The sarcomere is the functional contractile unit of myofibrils, composed of myosin (thick) and actin (thin) filaments, whose arrangement creates the striated appearance seen under a microscope. Muscle contraction occurs as these filaments slide past each other, shortening the sarcomeres.	contribute to joint deformity. As OA progresses, the overall joint structure is affected. Ligaments may weaken, and surrounding muscles can atrophy due to reduced activity caused by pain and limited joint movement. The joint capsule thickens, and the joint space narrows, leading to further stiffness and instability.	

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

Contributing Risk Factors	Signs and Symptoms
Aging Genetic factors Obesity Metabolic disorders – diabetes, sickle cell Women Joint injury due to acute or repetitive stress on joints	Joint pain and stiffness Pain with ROM Muscle atrophy, loss of function Crepitus Enlarged joints Joint effusion Inflammation Heberden's nodes enlarged at the distal interphalangeal joints Bouchard's nodes

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

Possible Therapeutic Procedures	Prevention of Complications
Non-surgical Intra-articular injections Acupuncture Surgical Total joint arthroplasty or replacement Osteotomy Arthroscopy Joint fusion	(What are some potential complications associated with this disease process) Muscle atrophy chronic pain and disability joint deformities infection synovitis

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

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

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

Anticipated Medication Management	Non-Pharmacologic Care Measures	What stressors might a patient with this diagnosis be experiencing?
Acetaminophen Prescription lidocaine patches 5% to relieve joint pain, topical salicylates and topical buspirone cream NSAIDS and analgesics to relieve pain Opioid analgesics (oxycodone) Muscle relaxants such as cyclobenzaprine corticosteroids	-Apply heat to joints to alleviate pain -Reduce the amount of exercise on days with increased pain -Foot insoles in shoes -Nutritional therapy -assistive devices such as braces or splints -physical therapy and exercise -massage	Lifestyle adjustments Chronic pain Decreased mobility Disability and functional impairment Ability to care for their family Financial stress Uncertainty about disease body

Client/Family Education

List 3 potential teaching topics/areas
Maintain joints in functional position. Use good posture when standing to maintain spinal curvature and proper weight distribution Heat can help with joint tenderness and muscle stiffness On days when pain is increased, attempt exercise, but reduce the number of repetitions and avoid resistance exercises.

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

Multidisciplinary Team Involvement (Which other disciplines do you expect to share in the care of this patient)
Physical therapist Dietitian Case manager Radiologist Nurse