Knee osteoarthritis

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Definition

- Arthritis is characterized by not only degeneration of the articular cartilage, but also inflammation of the synovium and changes to the underlying subchondral bone to the point where patients are typically debilitated by pain and resultant loss of function.

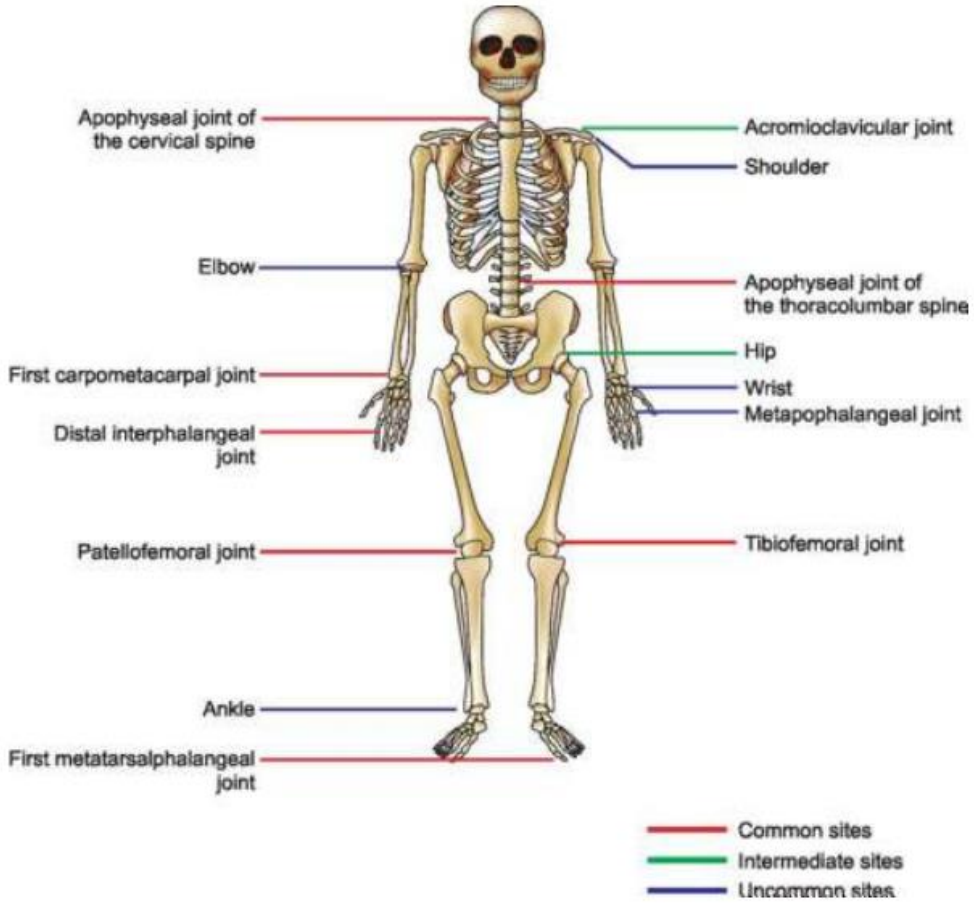
Types of knee OA

- Primary osteoarthritis
- Knee osteoarthritis

Primary osteoarthritis of the knee (also called idiopathic)

- Primary osteoarthritis is articular degeneration without any apparent underlying reason, the following factors are suspected to play an important role in the causation of primary osteoarthritis—obesity, genetics and heredity, occupation involving prolonged standing, sports, multiple endocrinal disorders and multiple metabolic disorders.

Note: Genetic tendency in OA knee is twice as strong as OA hip



Secondary osteoarthritis of the knee

Secondary osteoarthritis is the consequence of either an abnormal concentration of force across the joint as with post-traumatic causes or abnormal articular cartilage, such as rheumatoid arthritis (RA). It occurs in the younger age groups and is more severe than the primary.

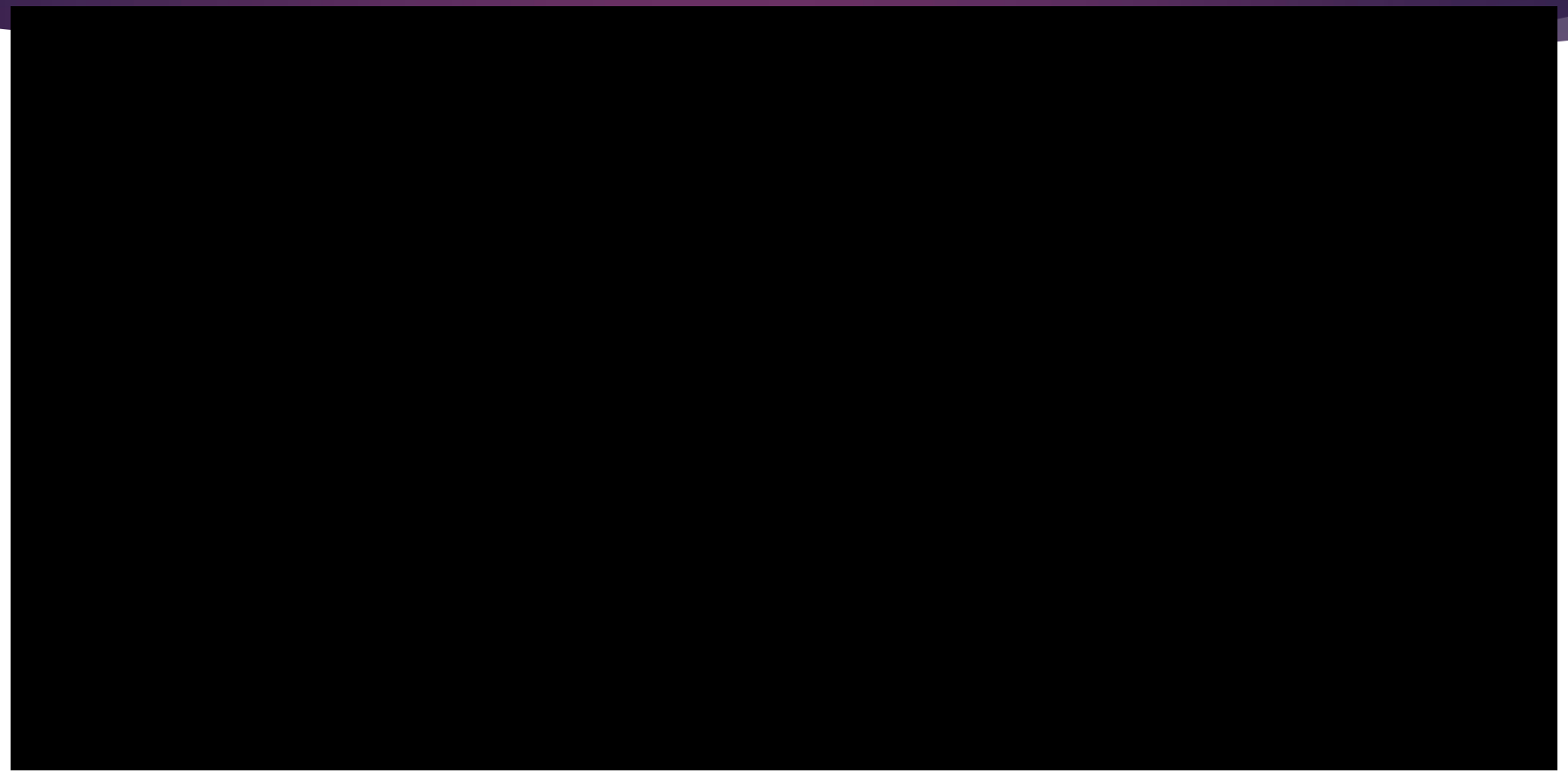
The causes for secondary osteoarthritis of the knee are as follows:

- Obesity.
- Valgus and varus deformities of the knee.
- Intra-articular fractures of the knee, etc.
- Rheumatoid arthritis, infection, trauma, TB, etc.
- Hyperparathyroidism.
- Hemophilia.
- Neurological disease like diabetes.
- Overuse of intra-articular steroid therapy.

prevalence

- It commonly affects the knee joint.
- All races are susceptible.
- Common in older age groups.
- 80% of people are affected by 40 years, but only 40% show symptoms.
- It causes varus deformity of the knee in the late stages.
- More than 50% have bilateral OA knee

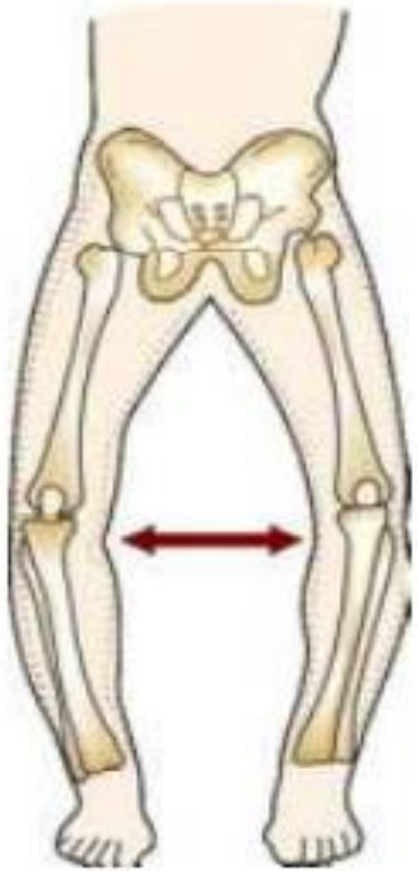
Stages of knee osteoarthritis



clinical finding

1. knee pain that is gradual in onset and worse with activity, pain after prolonged sitting or resting, and pain that worsens over time.
2. Stiffness: The patient complains of early morning stiffness, which subsides over the day after some activity
3. Swelling: The patient has mild swelling of the knee joint
4. Minimal tenderness and crepitus can be elicited

5. loss of normal joint function: If there are loose bodies in a joint, the patient gives history of locking or giving way. Terminal movements of the knee are restricted
6. Minimal effusion may be present.
7. In some cases, osteophytes may be palpable.
8. Genu varum deformity may be seen in very advanced cases



Risk factors

- **Modifiable**
- Articular trauma
- Occupation – prolonged standing and repetitive knee bending
- Muscle weakness or imbalance
- Health – metabolic syndrome

- **Non-modifiable**
- Gender - females more common than males
- Age
- Genetics
- Race

Diagnosis

- Patients typically present to their healthcare provider with the chief complaint of knee pain. Therefore, it is essential to obtain a detailed history of their symptoms.
- Pay careful attention to the history as knee pain can be referred from the lumbar spine or the hip joint.
- It is equally important to obtain a detailed medical and surgical history to identify any risk factors associated with secondary knee OA.

Clinical Symptoms of Knee OA
Knee Pain

- Typically of gradual onset
- Worse with prolonged activity
- Worse with repetitive bending or stairs
- Worse with inactivity
- Worsening over time
- Better with rest
- Better with ice or anti-inflammatory medication
- Knee stiffness
- Knee swelling
- Decreased ambulatory capacity

Physical examination of the knee should begin with

- **a visual inspection.** With the patient standing, look for periarticular erythema and swelling, quadriceps muscle atrophy, and varus or valgus deformities. Observe gait for signs of pain or abnormal motion of the knee joint that can indicate ligamentous instability. Next, inspect the surrounding skin for the presence and location of any scars from previous surgical procedures, overlying evidence of trauma, or any soft tissue lesions.
- **Range of motion (ROM)** testing is an essential aspect of the knee exam. Active and passive ROM with regard to flexion and extension should be assessed and documented.
- **Palpation** along the bony and soft tissue structures is an essential part of any knee exam. The palpatory exam can be broken down into the medial, midline, and lateral structures of the knee.

- A thorough **neurovascular exam** should be performed and documented. It is important to assess the strength of the quadriceps and hamstring muscles as these often will become atrophied in the presence of knee pain. A sensory exam of the femoral, peroneal, and tibial nerve should be assessed as there may be concomitant neurogenic symptoms associated.
- **Palpation of a popliteal, dorsalis pedis, and posterior tibial** pulse is important as any abnormalities may raise the concern for vascular problems.

Investigation

- **Laboratory investigations** are usually within normal limits.
- **Radiological examination** of the knee joint is the most important diagnostic tool. The following are the radiological features seen in osteoarthritis of the knee.

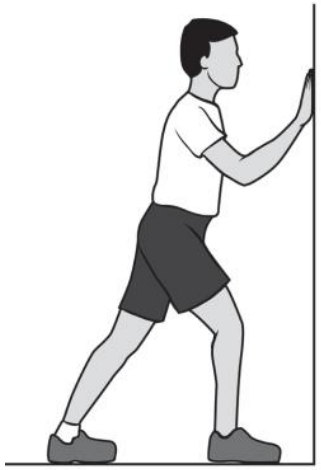
  - Loss of joint space.
  - Sclerosis
  - Subchondral cysts Osteophytes
  - Bony collapse
  - Deformity and malalignment

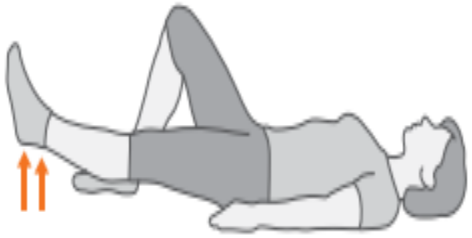
Nonoperative treatment

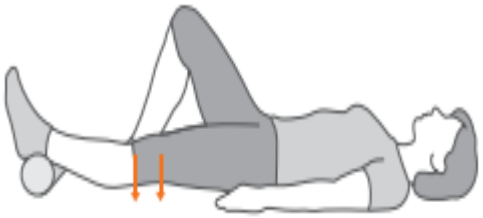
- Canes: Canes could be used to improve pain and function in patients with knee osteoarthritis. Patients are using the cane on the contralateral side.

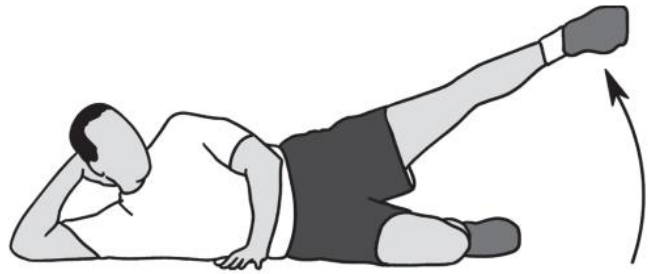
- Brace treatment could be used to improve function, pain and quality of life in patients with knee osteoarthritis.

Supervised exercise, unsupervised exercise, and/or aquatic exercise are recommended over no exercise to improve pain and function for treatment of knee osteoarthritis.

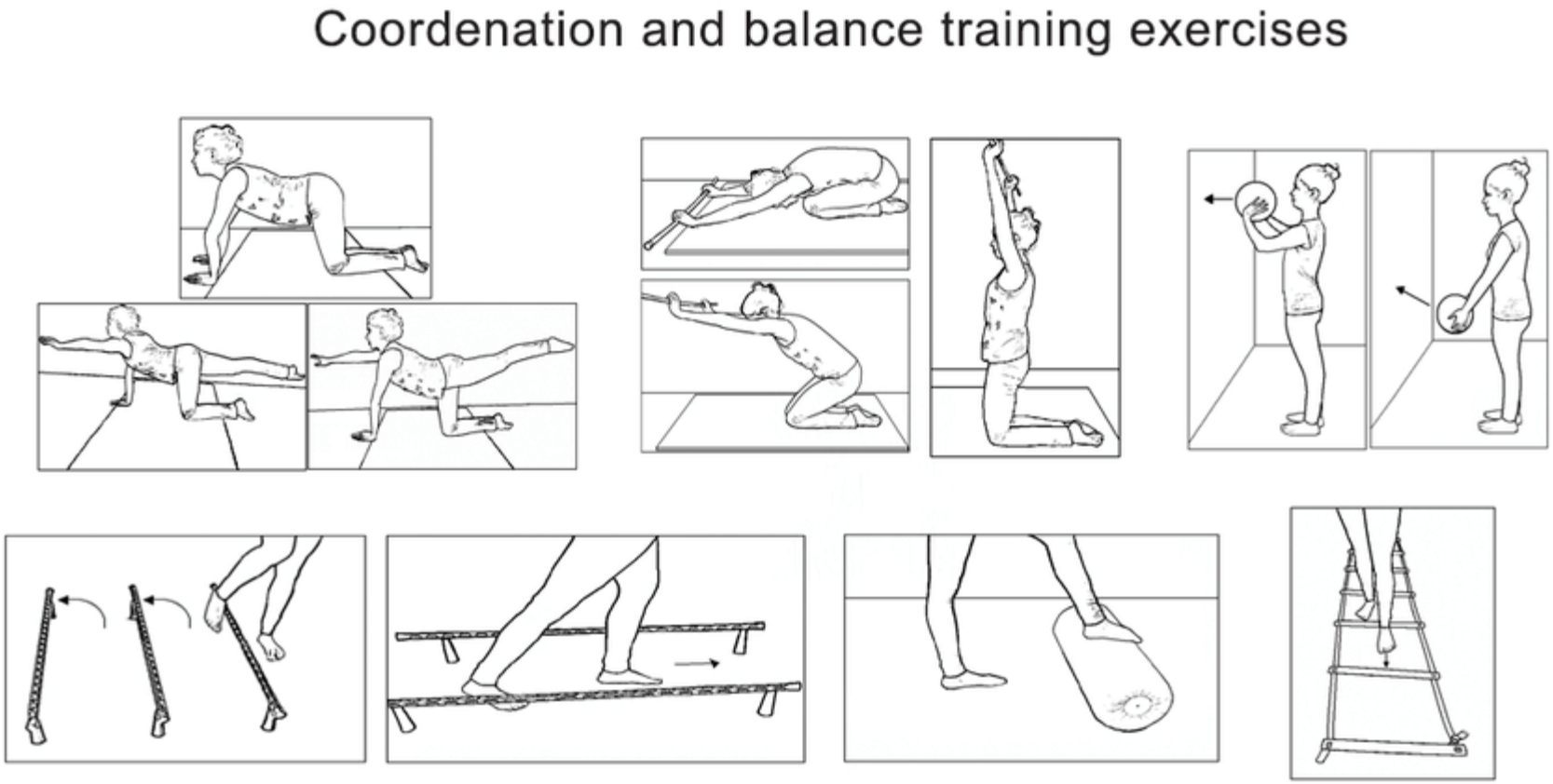








Neuromuscular training (i.e. balance, agility, coordination) programs in combination with traditional exercise could be used to improve performance-based function and walking speed for treatment of knee osteoarthritis.



- Patient education programs are recommended to improve pain in patients with knee osteoarthritis.

1. Understanding knee OA
2. Symptoms and progression
3. Treatment options
4. Joint protection strategies.
5. Follow-up care.
6. Lifestyle modifications.
7. Emotional support

- **Manual therapy** - effective to improve ROM· According to a systematic review, manual therapy (mobilization with movement, passive joint mobilization, patellar mobilization therapy) and exercises effectively reduce knee pain and increase functionality. However, further research is needed to determine the long-term effects of manual therapy on knee OA.

- **Massage** - may be useful to control pain in some subjects, but this has low evidence to show its effectiveness

Sustained weight loss is recommended to improve pain and function in overweight and obese patients with knee osteoarthritis. It is indicated in patients with symptomatic OA with a body mass index greater than 25. The best recommendation to achieve weight loss is with diet control and low-impact aerobic exercise.

Laser Treatment FDA-approved laser treatment may be used to improve pain and function in patients with knee osteoarthritis

- **Transcutaneous Electrical Nerve Stimulation** Modalities that may be used to improve pain and/or function in patients with knee osteoarthritis include:

a) Transcutaneous Electrical Nerve Stimulation (pain)

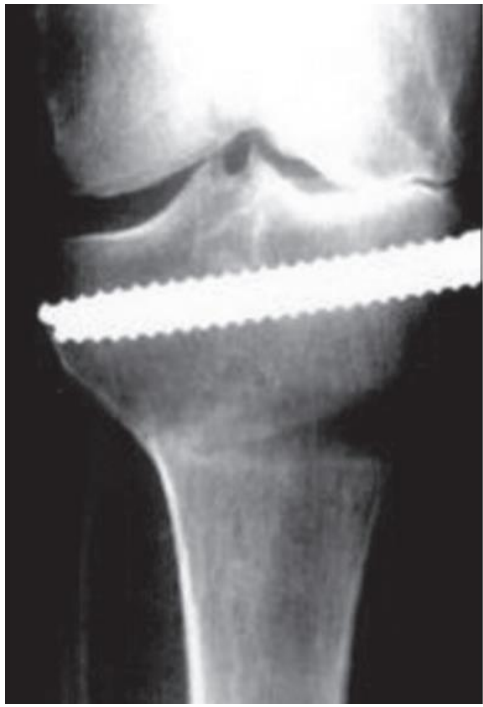
- **Percutaneous Electrical Nerve Stimulation** Modalities that may be used to improve pain and/or function in patients with knee osteoarthritis include:

a) Percutaneous Electrical Nerve Stimulation (pain and function)
b) Pulsed Electromagnetic Field Therapy (pain)

- **Extracorporeal shockwave therapy** may be used to improve pain and function for treatment of osteoarthritis of the knee.

Surgical care

- **A high tibial osteotomy** is considered with unicompartmental medial compartment degeneration
- **A UKA** also is indicated in unicompartmental knee osteoarthritis. It is an alternative to an HTO and a TKA. It is indicated for older patients
- **A TKA** is the surgical treatment option for patients failing conservative management and those with osteoarthritis in more than one compartment. It is regarded as a valuable intervention for patients who have severe daily pain along with radiographic evidence of knee osteoarthritis.



Indications for HTO

- Young (less than 50 years old), active patient
- Healthy patient with good vascular status
- Non-obese patients
- Pain and disability interfering with daily life
- Only one knee compartment is affected
- A compliant patient who will be able to follow postoperative protocol

Indications for UKA

- Older (60 years or older), lower demand patients
- Relatively thin patients

Indications for TKA

- Symptomatic knee OA in more than one compartment
- Failed non-surgical treatment options

An osteotomy performed on patients < 60 years old may delay the need for a knee arthroplasty for up to 10 years

- FWB is restricted for 4 weeks; this may be delayed further with the use of an external fixator.
- Resistance distal to the osteotomy site, such as ankle cuff weights, is also not permitted for 4 weeks. Therefore, cuff weights are placed more proximally on the distal thigh for progressive resistance exercises.
- Full ROM is encouraged immediately following surgery.
- Neuromuscular electrical stimulation may be considered to minimize strength loss and assist recovery of the quadriceps muscle, although the knee position would be modified to a fully extended position.

Prognosis

- Strong evidence shows that age, ethnicity, BMI, the number of co-morbidities, MRI-detected infrapatellar synovitis, joint effusion, and both radiographic and the baseline of OA severity are predictive for clinical progression of knee osteoarthritis.
- The most severe cases will result in total knee arthroplasty.

Complications

Complications associated with non-surgical treatment are largely associated with NSAID use.

- **Common Adverse Effects of NSAID Use**
- Stomach pain and heartburn
- Stomach ulcers
- A tendency to bleed, especially while taking aspirin
- Kidney problems

Common Adverse Effects of Intra-Articular Corticosteroid Injection

- Pain and swelling (cortisone flare)
- Skin discoloration at the site of injection
- Elevated blood sugar
- Infection
- Allergic reaction

Thank you