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# Joint Pain Management: Focusing on Osteoarthritis

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**Abstract**

Joint pain can be classified as either mechanical which is activity related or inflammatory in nature. Osteoarthritis (OA) is the most common cause of mechanical joint pain. It is due to the inefficient repair process of synovial joints and not a disease, as commonly thought. Sometimes this process fails and patients presents with symptoms of pain and functional impairment. As joint pain classification is based on signs and symptoms; x-rays are usually not needed.

**Keywords:** Joint pain; Osteoarthritis; Management option

## Introduction

### Joint Pain Classification

Joint pain can be classified as either mechanical which is activity related or inflammatory in nature [1,2]. Osteoarthritis (OA) is the most common cause of mechanical joint pain. It is due to the inefficient repair process of synovial joints and not a disease, as commonly thought. Sometimes this process fails and patients presents with symptoms of pain and functional impairment. As joint pain classification is based on signs and symptoms; x-rays are usually not needed.

### Clinical features of Mechanical Joint Pain

This will include joint pain that is worse when exercising and relieved by rest. Other common symptom includes stiffness that lasts for less than 30 minutes in the morning and exacerbated by inactivity. Physical examination and imaging of the affected joints often shows reduced joint space, reduced range of movement, crunching (crepitus) sound on movement and fluid collection known as effusion [1,2].

### Risk Factors for Osteoarthritis

a) Age and gender: Rare under the age of 40 years but then increases with age; more common in women, except in cases of hip OA.

b) Obesity: In patients with new-onset knee pain, 25% of cases were related to being overweight or obese.

c) Genetics: Inheritance plays a major factor in causing osteoarthritis, accounting for around 60% of hip OA and 40% of knee OA.

d) Major joint injury: Ligament rupture leads to early-onset knee OA in 13% of cases after a period of 10-15 years.

e) Certain Occupations: There is a more than five-fold greater risk of knee OA among workers aged ≥55 years exposed to heavy lifting, kneeling, squatting or stairs climbing.

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f) Abnormal leg alignment: Bow-legged knee alignment doubles the risk of knee OA and increases its rate of progression

**Commonly Affected Joints**

OA is most commonly encountered in the hands, feet, knees (18% of those aged over 45 years) and hips (11% of those over 45 years), but other joints can also be affected. It is not unusual to have OA in more than a single joint.

**There are a few differential diagnosis. This includes:**

1. Inflammatory arthritis (Exp: gout, rheumatoid arthritis)- Differs from OA in that pain is more on resting and improves on movement. Stiffness and joint descruction are also cardinal features of these conditions.
2. Fibromyalgia – a difficult condition to diagnose but characteristerised more by fatigue,musculoskeletal pain and multiple trigger points over the joints.
3. Malignancy – characteristics by swelling, pain and is often unilateral.More common in the younger age group and on the long bones such as humerus and femur rather than joints.

## Pharmaceutical Care Issues

### Therapy Goals

To relieve pain and swelling, maintain or improve joint function, prevent further loss of function, and maintain or improve quality of life.

### Cases that are within the domains of expertise of Community Pharmacist (CP)

a) Usage exacerbated pain that is improved by rest

b) Morning stiffness that lasts less than 30 minutes

c) No fever or unexplained weight loss

d) No previous injury

### Cases that must be referred by the Community Pharmacist to a General Practitioner (GP) or specialist

a) Pain that is worse on rest and improves with usage

b) Morning stiffness that lasts longer than 30 minutes

c) Rapid worsening of symptoms

d) Hot, swollen joints

e) Systemic upset

f) History of trauma or cancer

## Pharmaceutical Care Plan [3,4,5]

### Recommendation at First Presentation

a) Non-Pharmacological

CP can conduct patient education and counseling, emphasizing on usage-related joint pain and weight management. CP may also recommend alternative dietary supplements. One option is glucosamine sulfate 400–500mg taken three times daily, with or without chondroitin and methylsulfonylmethane (MSM). These maybe considered to prevent joint degradation and relieve pain. Evidence to support treatment is contradictory; many studies that support its use are low quality. The adverse effect profile of glucosamine is similar to that of placebo.

b) Pharmacological

First-line drug Treatment

Topical non-steroidal anti-inflammatory drug (NSAID) that is both effective and safe. This is helpful for knees or smaller joints that are located near the surface of skin. However, it has limited efficacy for widespread joint pain. Its formulation includes creams, gels, ointments & plasters. In term of side effects, only rarely does a local reaction develop. Exp: methyl salicylic 25% ointment (Menzza), diclofenac 1% gel (Voren), ketoprofen 2.5% gel (Fastum), diethylamine salicylate 5g with aesin 1g gel (Reparil), flurbiprofen plaster (Accustop). Diclofenac 1% gel (or patch is FDA labeled for minor trauma): Four short-term trials showed a 50% reduction in pain in 40% of subjects (Number Needed to Treat (NNT) = 5); longer-term trials had NNT = 10. Comparative trials with oral NSAIDs administration showed no difference in the proportion who achieved satisfactory pain relief. Oral NSAIDs is a controlled medication and only can be prescribed by a registered physician.

c) Refer to other Relevant Healthcare Professionals

i. Physiotherapist or Occupational Therapist

Assists in advising for strengthening and flexible aerobic exercises, provide support with braces and Transcutaneous Electrical Nerve Stimulation (TENS) therapy. They may even advice for appropriate footwear, if managing lower limb joint pain to assist in stability and increased muscle strength.

ii. Dietician or Nutritionist

Can advise appropriate dietary plan for patient to assist in weight loss that relieves the stress on the knees and therefore help reduce the symptoms of osteoarthritis.

## Recommendation at Second Presentation

a) If symptoms improve, review and continue if necessary.

b) If symptoms persist, consider second-line drug treatment.

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i. Oral Paracetamol

Good for mild-to-moderate pain. With as-needed doses followed by scheduled dosing to maximum of 3g daily in divided doses. Maximum of 4g daily may be allowed for healthy older adults with closer monitoring. Dose can be 1000 mg every 6 hours for up to three times daily or 650 mg every 6 hours. Ensure that patient knows to watch for often "hidden" acetaminophen in other products, example in cases where patient is already taking tablet Ultracet. There is a need to monitor for hepato toxicity in patients with elevated risk of liver disease via periodic liver function tests. These high risk patients are those with previous liver problems or history of regular and heavy alcohol consumption.

ii. Oral Non-Steroidal Anti-inflammatory Drugs (NSAIDs)

Usually used if oral paracetamol response is inadequate in relieving the joint pain. NSAIDs can be further classified into predominant Cyclooxygenase (COX) 1 blocker which is tablet aspirin 300mg, nonselective COX-1 and COX-2 blockers which are tablet diclofenac 50mg, tablet ibuprofen 200mg, capsule mefenamic acid and predominant COX-2 blocker which is tablet meloxicam 7.5mg. NSAIDs should be used in a low to moderate daily dosefor a short term period only. This is due to the fact that NSAIDs are responsible for 30% of hospital admissions for Adverse Drug Reactions (ADR), mainly due to rash, upper Gastro Intestinal (GI) bleeding, hypertension, heart failure and renal impairment. In a published report by Pharmacovigilance Section of National Pharmaceutical Regulatory Agency (NPRA), Ministry of Health, Malaysia, when ADR reports for 2017 is categorized by pharmacological group, analgesics is second most reported after anti-infective agents.

Also to be noted is that pharmacodynamic and pharmacokinetic changes are common with aging. In older population, drug pharmacological action may have an increased sensitivity towards body. Older populations also have slower gastric emptying rates. Due to these factors, in case of NSAIDs, older people are prone to the ADRs. One of the most common and serious side effects is upper GI bleeding. Hence, it is advicable to avoid chronic use, prescribe an alternative or if needed, to add on gastro protection agents. Syrup magnesium trisilicate mixture (MMT) is commonly dispensed with NSAIDs. Histamine-2 Receptor Antagonist (H2RA) such as oral ranitidine or Proton Pump Inhibitors (PPI) such as oral omeprazole, pantoprazole, esomeprazole, rabeprazole or dexlansoprazole are also used to reduce the incidence of upper gastrointestinal (GI) side effects of oral NSAIDs. However, PPI use is only recommended for short term use as studies have shown long term use may lead to fractures and even increase risks for serious GI infections. The National Institute for Health & Care Excellence (NICE) recommends using oral paracetamol, topical NSAID or oral opiods, depending on the individual risk factors for adverse effects, for pain relief in older people. Frequent review and monitoring for ADRs are required in patients taking long term NSAIDs. Monitor complete blood cell count, Blood Urea Nitrogen (BUN), serum creatinine, and aspartate aminotransferase at least annually.

### Third-line drug treatment

These are only initiated after a CP review and manage, symptoms worsen and CP decides to refer to a GP or specialist for further management.

i. Oral COX-2 Selective Inhibitors

Examples of drugs are capsule celecoxib 200mg, tablet etoricoxib 90mg and 120mg.

The benefit is that this drugs may not cause adverse GI effects but can still predispose to renal failure, hypertension and heart failure. Therefore, its use is only for short term.

ii. Opioids

These are poorly tolerated owing to central nervous system side effects; can be addictive; use at lowest dose for shortest time; constipation. Examples of drugs are tablet Ultracet which is a combination of paracetamol 325mg and tramadol 37.5mg. Capsule tramadol 50mg, is rarely prescribed alone.

iii. Intra-articular Injections

Methylprednisolone or triamcinolone 10 to 40mg injection depending on size of joint; may be repeated every 3 months. Primary adverse effects are risk of septic arthritis, synovitis Intra-articular hyaluronans may be used if glucocorticoid injections are ineffective. Meta-analysis indicates effects last up to 30 weeks. Frequency of injection is undetermined, maybe annual or often more. It should only be administered by a registered physician with sufficient training and experience in performing similar procedures.

## Conclusion

All CPs clearly have an important role to play in the management of joint pain and in supporting patients with their day-today pain relief. However, as with many areas of extended scope for pharmacists, this needs to be improved and recognized more widely. Referal to registered physician may be needed for unresolved cases and in cases where more specialized treatment is needed.

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