# ORTHOPAEDICS

## FOR PRIMARY HEALTH CARE

**Volume 2**

**Non-Emergency and Non-Trauma Pathology**


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**ORTHOPAEDIC DEPARTMENT**

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# Multiple painful joints

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## Learning objectives

- Evaluate a patient with multiple joint pains (polyarthralgia).
- Formulate a description of an x-ray.
- Develop a differential diagnosis of polyarthralgia.
- Outline a basic initial non-surgical management plan.
- Understand the indications and options for surgical management.

## Case presentation

A 70-year-old obese female patient presents complaining of multiple painful joints. She localises the pain to both hips, both knees and her right elbow. She has had no recent trauma, no comorbidities and no family history of arthritis. She states that the pain started insidiously about 1 year ago and has gradually worsened. The pain is worse when the weather is cold, on movement and especially in the evening at the end of an active day.

Examination reveals swollen knees with mild synovitis, small effusions and palpable crepitus, but full stable range of movement. Passive rotation of both hips reveals groin pain and limited range of movement with fixed flexion contractures of 30º. Her right elbow similarly has decreased range of movement (10º to 100º), synovitis and crepitus. There is no neurovascular deficit.

***Figure 1**: Anterior-posterior (AP) x-ray of the patient's left hip shows markedly narrowed joint space, subchondral cysts and sclerosis, and osteophytes*

## Blood tests

A rheumatic screen is negative.

## Differential diagnosis

See the list at the end of the chapter. After correlation with the patient's history and examination findings and negative blood results, the diagnosis of osteoarthritis is made.

## Management

### Non-surgical

**ELMPOPI:**

**E**ducation: The patient is informed about the nature of the condition – a form of degeneration of the articular cartilage.

**L**ifestyle **M**odification: A discussion is held with the patient to see if avoiding activities that exacerbate the pain, such as long walks or sitting on low chairs, is an option. Weight loss is advised and a dietician is consulted.

**P**hysiotherapy: Weight loss exercises that avoid causing more joint pain are commenced. Other specific exercises include dynamic stabilisation of the knees and gait training. A walking aid, such as a crutch or walking stick, is offered to the patient and she is educated on its use.

**O**ccupational therapy: The occupational therapist (OT) provides an assistive device to allow the patient to open tight jars and taps without hurting her elbow. They discuss and consider hinged knee braces should her knees feel unstable in the future.

**P**ills: Paracetamol, nonsteroidal anti-inflammatory drugs (NSAIDs) and Tramadol are prescribed for the patient to use as required.

**I**njections: After 3 months of the above treatment, the patient requests an injection. A local anesthetic and steroid injection (LASI) is performed with aseptic technique into both knees. The patient reports transient improvement of the symptoms.

### Blood tests

After 6 months of adequate therapy as above and successful weight loss to a body mass index (BMI) of below 40, the patient is still not coping with the pain in her lower limbs. A careful history and repeat examination reveal that the left hip joint is causing the most pain, and she is scheduled for a total hip replacement. The surgeon opts for a metal-on-polyethylene bearing surface and an uncemented cup and stem. In this case a single screw was used to secure the acetabulum sufficiently. The operation is successful and she elects to continue non-operative treatment for her other joints for the time being

## Introduction

Polyarticular joint pain is a common complaint seen at primary care facilities. There is a wide differential diagnosis to the cause of polyarticular joint pain making the diagnostic process challenging. However, a comprehensive history and physical exam help point towards the most likely cause of the complaint.

In this chapter, a general approach to the differential diagnosis of polyarticular pain and the management thereof is provided. A case study is provided to demonstrate an approach to a patient complaining of multiple painful joints.

## History

Ask for important components in the history such as:

**Duration:** How long has the pain been there?

**Progression:** Is it getting better or worse or the same? Are the joints mostly painful and stiff in the morning (suggestive of autoimmune inflammatory arthritis) or painful after exercise (suggestive of osteoarthritis)?

**Associations:** Is there any rash, synovitis or effusion? Is there any fever indicative of an infection? Is there weight-loss, night sweats or loss of appetite (suggestive of TB).

**Aetiology:** History of trauma? Symptoms suggestive of infection?

Previous or other joint pains? Previous

medical history? Previous surgical history?

## Examination

Structure your examination into inspection, palpation and movement.

### Look

Site: Determine location of the joint pains – which joints?

Any erythema, scars or sinuses?

Any swelling or bony deformity noted?

### Feel

Temperature: Does the overlying skin feel warm?

Is there synovitis?

Is there an effusion? In the knee, for a small effusion, do the swipe test; for a large effusion, the patellar tap test.

Tenderness: Is it tender? Is it joint line pain or enthesitis (pain at insertion of ligaments)?

### Move

What is the range of movement of the joint in degrees, both active and passive? If less than $10^0$ or $20^0$ and passive movement causes extreme pain, consider bacterial arthritis. If mechanically decreased range, consider osteoarthritis.

Is there crepitus on movement?

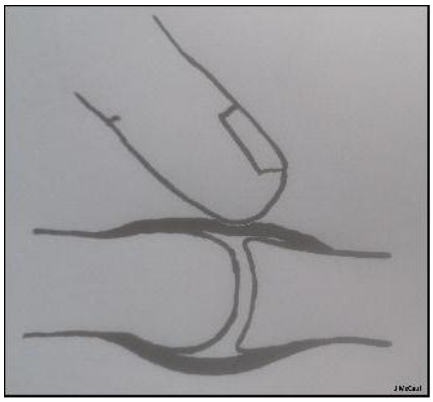

***Figure 2**: Synovitis – joint space is not easily palpable due to thickened synovium (feels like a blanket)*

## Systemic examination

General examination.

Identify any other joints involved.

## Special investigations

### Plain film x-rays

On x-rays you will gain important information (see chapter on approach to orthopaedic x-rays).

Specifically look for:

- Identify view, patient and date.
- Is the patient skeletally mature?
- What joint is involved?
- Is there markedly reduced joint space without many osteophytes? And is there periarticular osteopaenia? – suggestive of rheumatoid arthritis.
- Is the joint space narrowing accompanied by osteophytes, subchondral cysts and sclerosis? – suggestive of osteoarthritis.
- Are there 'rat bite' erosions on the edges of the joint? – suggestive of gout.

***Figure 3**: Periarticular erosions in a patient with rheumatoid arthritis*

### Blood tests

If suspecting an autoimmune or inflammatory disorder:

- Erythrocyte sedimentation rate (ESR), c-reactive protein (CRP), rheumatoid factor (RF), antinuclear antibody (ANA), anti-cyclic citrullinated peptide (CCP).

- Consider anti double-stranded deoxyribonucleic acid (ds-DNA) if suspicious of systemic lupus erythematosus (SLE), or human leukocyte antigen (HLA) B27 if suspicious of ankylosing spondylitis.

If suspecting an infection:

- Full blood count (FBC), ESR, CRP.
- Urea and electrolytes (U&E), especially if patient is ill.
- Consider viral studies, such as hepatitis and parvovirus.
- If suspecting a systemic disorder, especially endocrine, liver function tests (LFTs), thyroid studies, comprehensive metabolic panel (CMP), albumin, alkaline phosphatase (ALP).

## Joint aspiration

- Should be performed with sterile technique.
- Inspect and record nature of aspirate: Frank pus? Keep nil per os (NPO) and refer to orthopaedic surgeon for arthrotomy in theatre. Straw-coloured? Consider tuberculosis (TB). Frank blood? Consider trauma or haemophilia.
- Send for: microscopy, culture and sensitivity (MC&S), TB GeneXpert polymerase chain reaction (PCR), TB culture, crystals.

## Synovial biopsy

In cases of diagnostic dilemma, a synovial sample can be taken by an orthopaedic surgeon in theatre and sent for histology, TB PCR and culture, MC&S.

# Differential diagnoses

The differential diagnoses of polyarthralgia are wide. History, examination and special investigations will help identify the cause.

**More than 6 weeks?**

Could be a systemic rheumatic condition such as: rheumatoid arthritis, SLE, Sjogren's syndrome, sarcoidosis, etc.

Consider osteoarthritis.

Consider amyloidosis (rare).

**Less than 6 weeks and involving the spine?**

Could be a spondyloarthropathy, such as: ankylosing spondylitis, psoriatic arthritis, inflammatory bowel disease (IBD). Juvenile idiopathic arthritis and reactive arthritis can also involve the spine.

Consider osteoarthritis.

**Does it relapse and remit (come and go)?**

Consider gout or pseudogout (crystals in the joint aspirate).

Consider haemophilia in a young male (recurrent bleeds into joints).

**Is it a short history and an ill patient?**

Consider infection: multiple bacterial arthritis (rare), gonococcal arthritis, viral.

Tuberculosis, especially if a slightly longer history or insidious onset.

Consider polyarthralgia accompanying a flu-like illness if no synovitis.

**Does the patient have a rash or vasculitis?**

Consider Henoch-Schoenlein purpura, polyarteritis nodosa, granulomatosis.

**Does the patient have an endocrine disorder?**

Hypo or hyperthyroidism or hyperparathyroidism can cause joint pain.

**Does the patient have no synovitis or effusion, but tender trigger points?**

Consider fibromyalgia.

## Management

The management is directed to the cause:

- Osteoarthritis: conservative management, as above, refer to orthopaedic surgeon to consider arthroplasty or arthrodesis if it requires surgical management.
- Inflammatory or autoimmune: refer to rheumatologist to confirm diagnosis and consider disease-modifying antirheumatic drugs (DMARDS). See the American College of Rheumatology (ACR) 2010 diagnostic criteria for rheumatoid arthritis.
- Systemic or endocrine: treat supportively and refer to medicine or endocrinologist to consider targeted treatment.
- Infective: identify the organism and treat according to sensitivities. If bacterial, septic arthritis washout in theatre is mandatory.

## Key takeaways

- Polyarticular arthritis has multiple causes, but narrowing down the differential diagnosis is primarily through history-taking and examination.
    - Are there signs of acute infection?
    - Are there constitutional symptoms?
    - What is the timeline?
    - What is the pattern of joint involvement?
    - Is this inflammatory or mechanical?
    - Are there associated symptoms?
- After answering these questions, appropriate investigations, including serologic, tissue or imaging studies can be added to further narrow your differential diagnosis.

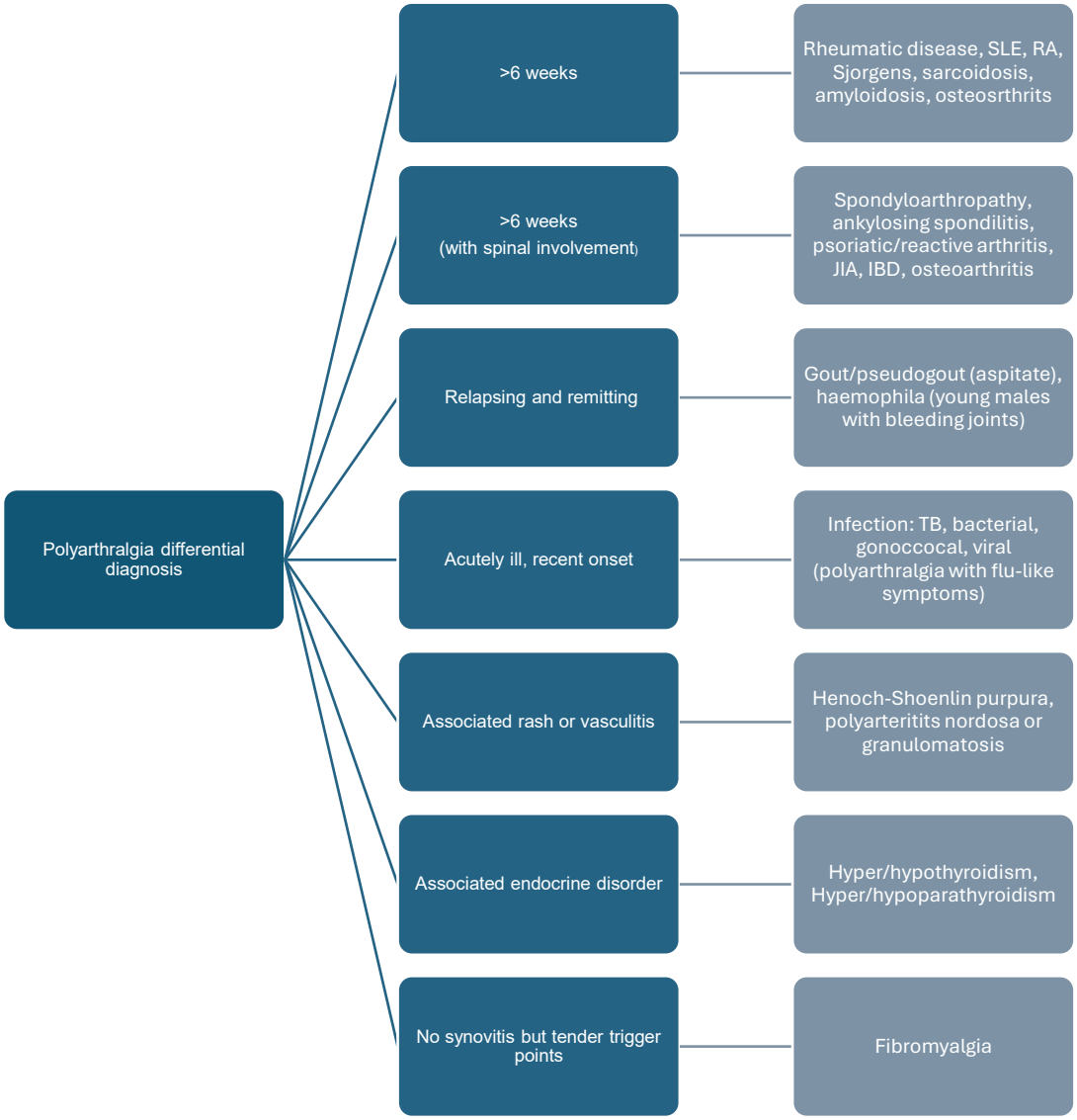


***Figure 4**: Diagnostic aid for forming a differential diagnosis for polyarthralgia*

# Assessment

1. Mrs Pietersen is a 55-year-old woman with an extensive pack-year smoking history. She presents to you complaining of 2 months of swelling, stiffness and pain in her knuckles. The stiffness is worse in the morning and gets better throughout the day. On examination you palpate symmetrical synovitis of her metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints. What is the most likely diagnosis?

   A. Psoriatic arthritis
   B. Septic arthritis
   C. Osteoarthritis
   D. Rheumatoid arthritis

The answer is (D). Rheumatoid arthritis classically presents clinically with symmetrical pain, stiffness and swelling of the PIP and MCP joints. As it is an inflammatory arthritis, the associated stiffness is commonly worse in the mornings and improves with movement as the day progresses. A risk factor is smoking.

2. Which x-ray finding is most specific for osteoarthritis?

   A. Joint space narrowing
   B. Osteophytes
   C. Subchondral cysts
   D. 'Rat bite' erosions

The answer is (A). Joint space narrowing is common in many forms of arthritis; subchondral cysts are seen in late-stage rheumatoid arthritis; 'rat bite' lesions are seen in gout.

## References and further reading

Bombei, B., Freilich, A., Pgy, D.O., & Larsen, D. (2019). Approach to polyarthritis for the primary care physician. Osteopathic Family Physician, 10(5), 24-31, https://www.ofpjournal.com/index.php/ofp/article/view/612.

Aletaha, D., et al. (2010) Rheumatoid arthritis classification criteria: An American College of Rheumatology/European League against rheumatism collaborative initiative. Arthritis & Rheumatism, 62, 2569-2591. https://doi/org/10.1002/art.27584

Dwyer, T. (n.d.).The bone school: Non operative management. Available at: http://52.62.202.235/miscellaneous/non-operative-management

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## ABOUT THE BOOK

This is the second volume of the *Orthopaedics for Primary Health Care* textbook edited by Michael Held, first published in 2021.

Most patients with orthopaedic pathology in low- and middle-income countries are tested by non-specialists. This book was based on a Delphi consensus study* with experts from Africa, Europe and North America to identify topics, skills and cases concerning orthopaedic trauma and infection that need to be prioritised in order to provide guidance to these health care workers.

The aim of this book is to be student-centred.

*Held et al. Topics, Skills, and Cases for an Undergraduate Musculoskeletal Curriculum in Southern Africa: A Consensus from Local and International Experts. JBJS. 2020 Feb 5;102(3):elO.



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The information in this book is meant to supplement, not replace, orthopaedic primary care training.

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