INVITED ARTICLE

# APPROACH TO JOINT PAINS

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*ABSTRACT*

***Aches and pains are common clinical problems. There are many causes of rheumatic pains and a simple classification is given in this article. The approach to the problem should be clinical, and starts with careful history, physical examination and some simple investigations. Most of the common rheumatic problems can be diagnosed easily using the clues to diagnosis given here. Those which are unresolved and problematic can then be referred for further evaluation.***

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Joint pain is a common problem that brings the patient to the doctor. There are many causes of aches and pains affecting the joints. A useful classification of rheumatic diseases is as follows:

## CLASSIFICATION OF RHEUMATIC DISEASES

1) Diffuse connective Tissue Disease eg. Systemic Lupus Erythematosus (SLE), Rheumatoid Arthritis (RA)
2) Arthritis associated with Spondylitis eg. Ankylosing Spondylitis (AS), Reiter's syndrome
3) Degenerative Joint Disease eg. Primary Osteoarthritis (OA)
4) Arthritis associated with infectious agents eg. Staphylococcus septic arthritis
5) Metabolic and endocrine disease associated with rheumatic states eg. gout
6) Neoplasia eg. villonodular synovitis
7) Neuropathic Joints eg. Charcot's Joint
8) Bone, periosteal and cartilage disorders associated with joint complaints eg. osteoporosis
9) Miscellaneous eg. internal derangement of joint

## IDENTIFY THE PROBLEM

It is very important to firstly identify the precise problem that brings the patient with arthritis to seek medical attention. The following are common problems encountered:

1) **Unknown or incorrect diagnosis** is the most common reason to seek medical attention. This will be discussed in greater detail in the following paragraphs.
2) **Uncontrolled arthritis** - The diagnosis is clear to all but the patient continues to suffer from uncontrolled inflammation and severe pain. The examination of this patient is therefore to assess the extent and severity of the inflammation and decide whether or not to add a more potent and potentially more toxic disease modifying anti-rheumatic drug.
3) **Structural damage** - It is important to recognise that the patient's pain and disability is due to structural damage and not to ongoing inflammation. Careful functional assessment of the patient and referral to the Orthopaedic Surgeon for surgical opinion is the correct thing to do.
4) **Pain Amplification Syndrome** - Confusion may arise when a patient with a typical rheumatic condition eg. RA seeks treatment for widespread aches and pain associated with unrefreshed sleep due to Fibromyalgia. Sometimes such patients are mistakenly given steroids because they are thought to have uncontrolled arthritis.
5) **Extra articular involvement** - Patients with a known rheumatic disease eg. RA who presented with joint pains may have complained of arthritis but are fatigued and short of breath because of pulmonary fibrosis. This is a very important extra articular problem and we have to treat that complication and not just the arthritis.
6) **Complications of Rheumatic Therapeutics** - Inappropriate use of Non Steroidal Anti-Inflammatory Drugs (NSAID) particularly in the elderly often leads to many problems eg. reversible NSAID nephropathy and NSAID gastropathy. The patient with obvious OA may be pale and fatigued from NSAID induced gastric erosions. The NSAID must be discontinued and the anaemia and gastric erosions treated.

Complete discussion on each of these problems is beyond the scope of this article and the reader is referred to standard Rheumatology textbooks or other articles in this Rheumatology series for further details. The rest of this article discusses how to sort out the problem of undiagnosed joint pain.

## APPROACH TO JOINT PAIN

Information to help us make a diagnosis is obtained with the usual history, physical examination and then simple investigations. Treat each bit of informaton like a piece of the jig-saw puzzle. Collect all the information to see the whole picture.

### History

Note the patient's age and sex and take a careful history of the patient's complaints. Ask about the onset, distribution, duration, progression, frequency of attacks, aggravating and relieving factors of these aches and pains. Decide whether there is just arthralgia or if there is arthritis. Arthritis is an inflammatory condition and hence is associated with redness, warmth, swelling, pain and loss of function of the joint. Constitutional symptoms like fevers, rigors, morning stiffness, fatigue and

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loss of weight are other important features of an ongoing inflammatory process. Grade the functional status of the patient and find out if the problem is due to arthritis alone. If the patient is taking any medication for the pain find out about its efficacy and possible side effects. Systemic review would include questions on all the organ systems. This includes central nervous system complaints like headaches, fits, weakness, numbness; cardiopulmonary complaints like shortness of breath, cough, hemoptysis; gastrointestinal complaints like abdominal pain, diarrhoea; and genitourinary complaints eg. dysuria. Questions should be asked about cold sensitivity and photosensitivity. Details about any rashes, mucosal lesions and ocular lesions noted. The past medical history is important. This includes previous illness eg. preceding diarrhoea, previous treatment as the rheumatic problem may be an adverse drug reaction, previous surgery eg. breast implants, and vaccinations. Social history including occupational exposure to toxins, travels and sexual history should be taken.

**Physical Examination**

From the history one can often make a good guess as to what the diagnosis is. After the physical examination we can confirm what we already suspect and find new clues to the diagnosis. Start with a rheumatologic examination (patients often expect us to do that first as they came with a rheumatic complaint) and then do a complete physical examination.

*Rheumatological Examination* is described in detail here. Start by examining the hands as this is often most informative besides being a socially appropriate place to start. Inspect the hands to look for evidence of inflammation of the joints. Look also for features to suggest the diagnosis, eg. Rheumatoid nodules, vasculitis, dystrophic nails, psoriatic plaques, sclerodactyly, etc. Next, examine the joints. The wrist joint is put through a range of motion and the distal radio-ulnar joint is pressed (piano key sign). The metacarpo-phalangeal joints (MCP's) are individually examined for synovial swelling and tenderness. If there is no localised tenderness, then all the MCP's are squeezed together as there may be subclinical inflammation detected when examined collectively. Then the proximal interphalangeal joints and the distal interphalangeal joints are examined. Look for signs of inflammation and for deformities and decide whether these deformities are due to soft tissue laxity or due to joint destruction eg. Jaccoud's arthropathy in SLE vs Rheumatoid deformity. Inspect the interossei muscles which may be atrophied. The hand is then turned over and inspected for palmar erythema, vasculitis, Raynaud's, tendon thickening, etc. Examine for carpal tunnel syndrome, any localised nerve lesion, and check functional ability to grasp things and do fine movements. Palpate the extensor aspect of the forearm for nodules as you ascend up to the elbow joint. Put the joint through its full range of motion after checking for synovial swelling and inflammation. Examine the shoulder joint next, feeling the glenohumeral joint, acromioclavicular joint and then the sterno-clavicular joint to look for inflammation. Then palpate carefully the biceps tendon and the supra spinatus tendon. The shoulder joint is then put through the full range of motion. Next, examine the neck by palpating the fibrositic areas. The cervical spine is then palpated and the range of motion of the cervical spine is checked. Lateral flexion of the cervical spine cannot occur between the skull and C2. Hence limited lateral flexion is a good indicator of lower cervical pathology (often degenerative). When rotation is limited the site of pain helps indicate whether the upper or lower cervical spine is affected.

Next, feel the temporal mandibular joint - very often neglected in examination. While in the region, palpate the parotids, look for evidence of dry mouth and then check if the fully open mouth can accommodate three fingers. Small mouths can by due to Systemic Sclerosis (Scl) or Juvenile Rheumatoid Arthritis (JRA). The chest is next, with palpation of the costal cartilage, typical fibrositic areas in the pectoralis major and also the chest expansion in those with AS. The thoracic and lumbar spine is examined next. The finger-floor distance is a good assessment of the overall function of the spine. To better measure the movement of the lumbar spine alone, the Modified Schober technique is useful. Two marks, 15 cm apart with the 10 cm mark at the level of the posterior iliac spine are drawn over the lumbar spine with the patient standing upright. Forward flexion is measured and the distraction should be more than 4 cm. Thoracolumbar rotation is best measured with the patient sitting to fix the pelvis. The patient then lies down on the couch and the hips and knees are examined. If flexion contracture of one hip is suspected, then the opposite hip is held in full flexion to flatten the lumbar lordosis. This exposes the previously undetectable flexion deformity of the hip. The straight leg raising test is a useful index of nerve root compression as a result of spinal disease. The lower extremities are then examined. Any wasting of the quadriceps is noted as well as any signs of inflammation around the knee. Synovial thickening, effusions, bony enlargement, crepitus and popliteal cyst are sought and the knee put through its range of motion. The ankles and the subtalar joints and tarsal joints are examined. The metatarsal-phalangeal joints are examined individually and then compressed together. The first MTP is a common site of involvement for gout. The toes are examined for deformities and inflammation eg. sausage toe in Reiter's syndrome.

A complete physical examination of all the other systems follows. Examine the cardiovascular system, the respiratory system, the abdomen, the neurologic system and genitourinary system. Concentrate on looking for clues to diagnosis. The skin, mucous membranes and eyes are examined for associated complications of the suspected rheumatic condition. If Sjogren's syndrome is suspected, do a Shirmer's Test to test tear production.

The following are clues to diagnosis based on the history and physical examination:

*Sex* - Male - Gout, AS, and Reiter's Syndrome.
Female - SLE, RA, Scl

*Age* - Younger than 15 years of age - Acute Rheumatic Fever (ARF), JRA
Between the ages of 15 to 49 - RA, SLE
Older than 50 yrs - OA

*Joint Involvement*

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| Monoarticular | - Infection (the most important diagnosis to consider as early treatment is vital), crystal, trauma |
| Polyarticular | - RA, SLE, OA, Psoriasis |
| Symmetrical | - RA, SLE, |
| Asymmetrical | - Psoriasis, Crystal |
| Distal Interphalangeal Joint | - OA, Psoriasis |
| Proximal Interphalangeal Joint | - RA, OA |
| Metacarpal phalangeal Joint | - RA, Calcium pyrophosphate disease (CPPD) |
| Thumb carpal metacarpal phalangeal Joint | - OA |
| Lower extremity | - AS, Reiter's, Gout, Enteropathic arthritis, Sarcoidosis |
| Dactylitis | - Psoriasis, Reiter's |

*Duration of joint pain before consultation* -

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| Within a day or 2 | - gout |
| Within weeks | - Reiter's |
| Months | - RA |

*Chronology*

- Fixed - RA, OA, Psoriasis, Infection
- Migratory - Acute Rheumatic Fever

*Constitutional symptoms* -

Fever > 38°C - Infection, SLE, Vasculitis, JRA
Associated rigors - Infection, SLE, Reiter's

*Morning Stiffness and Fatigue* - RA, SLE

*Skin involvement* -

Sun-exposed - SLE, Dermatomyositis (DM)
Extensor surfaces - Psoriasis
Papular - SLE, Vasculitis
Necrotic - Vasculitis, SLE, RA
Urticarial - Drug, SLE, Vasculitis
Scaly - Psoriasis, Subacute cutaneous lupus
Calcinosis - CREST, DM
Erythema Nodosum - Sarcoidosis, ARF, Inflammatory Bowel Disease
Tophaceous - Gout
Nodules - RA, SLE, Scl

*Central Nervous System Complaints* -

Headache - Temporal Arteritis
Fits - SLE, Vasculitis, Lyme arthritis
CVA - SLE, Vasculitis
Myelopathy - RA, SLE
Radiculopathy - OA, AS
Entrapment neuropathy - RA, OA
Peripheral Neuropathy - SLE, RA, Vasculitis

*Ocular complaints* -

Conjunctivitis - Reiter's
Iridocyclitis - JRA, AS, Reiter's
Sicca - Sjogren's RA, SLE
Scleritis - RA, Vasculitis
Retinitis - SLE, Vasculitis
Optic Neuritis - Vasculitis, SLE

*Cardiopulmonary complaints* -

Sinusitis - Wegener's
Otitis - Cogan's
Hemoptysis - Wegener's, Goodpasture's, Hypertrophic Pulmonary Osteoarthropathy (HPOA)
Intersitial Pneumonitis - Scl, RA, SLE
Asthma - Churg Strauss
Serositis - SLE, RA
Valve lesion - AS, Reiter's, SLE, infective endocarditis

*Gastrointestinal complaints* -

Xerostomia - Sjogren's, RA
Stomatitis - Reiter's, Behcet's SLE
Initiation in deglutition - polymyositis
Post-deglutition dysphagia - Scl
Diarrhoea - Reiter's Whipple's, Inflammatory Bowel Disease
Cholecystitis - Polyarteritis Nodosa
Proctitis - Gonococcal infection

*Genitourinary complaints* -

Urethritis - Reiter's, Gonococcal infection
Glomerulonephritis - SLE, Henoch Schonlein Purpura, Vasculitis
Stones - Gout, Hyperparathyroidism
Ulcers - Reiter's Behcet's

## LABORATORY TESTS

Many tests are available for our use in the diagnosis of Rheumatic conditions but we must resist the temptation to order an entire battery of tests for every patient. Always start with simple blood tests like the Full Blood Count and Erythrocyte Sedimentation Rate which can help differentiate the inflammatory conditions from the non-inflammatory ones and systemic from non-systemic illness. Investigations of a solitary inflammed joint should include aspiration of the joint to look for infection or crystals. Even if only one drop of synovial fluid is available, it can be examined under the polarized microscope to look for crystals and then gram-stained for bacteria. The second drop can be sent for culture of possible microorganisms. If more synovial fluid is available it should be sent for a cell count to differentiate an inflammatory synovial fluid from a non-inflammatory one.

Another simple test that should be done is the urinalysis. This can detect asymptomatic inflammation of the kidney eg. in SLE or of the urethra eg. in Reiter's Syndrome. Other biochemical tests include muscle enzymes elevated in polymyositis, uric acid in gout, liver function tests for hepatitis, calcium and phosphate levels in suspected hyperparathyroidism.

Other acute phase proteins like the C-reactive Protein (CRP) is a useful test for an on-going inflammatory process eg. RA and Reiter's. Interestingly, the CRP is not elevated in SLE which is a disease marked by much inflammation, but is elevated in patients with SLE who develop an infection.

Many immunological tests are available and a brief description of their use is as given below:

### Immunological Tests

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| Rheumatoid Factor | - Seropositive RA patients have a worse prognosis. May be present in other Rheumatic and non-rheumatic conditions |
| Anti-nuclear antibodies | - autoimmune disease eg. SLE infection, drugs, ageing |
| LE Cell | - test for SLE but in practice, not often done because of the large amount of blood required for the test compared to the other serological tests for SLE |
| Anti-ds DNA | - SLE, rarely other autoimmune diseases |
| Anti-Ro (SSA) | - Sjogren's syndrome, Subacute cutaneous lupus, Congenital Heart block, |
| Anti-La (SSB) | - Primary Sjogren's Syndrome, SLE |
| Anti-Sm | - SLE, rarely other autoimmune diseases |
| Anti-RNP | - In high titres, "Mixed Connective Tissue Disease" Also present in SLE and other rheumatic diseases |
| Anti-Scl 70 | - Systemic Sclerosis of the Diffuse Variant |
| Anti-Centromere Antibodies | - CREST Syndrome |
| Anti-Neutrophil Cytoplasmic Antibodies | - Wegener's Granulomatosis |
| Anti-Cardiolipin Antibodies | - Recurrent thrombosis, spontaneous abortions and other features of Anti-Phospholipid syndrome |
| ASOT | - Acute Rheumatic Fever |
| Serum complements | - CH50, C3, C4 are low in SLE |

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| VDRL | - biological false positive standard test for syphilis associated with anti-phospholipid syndrome, SLE |
| TPHA | - positive in syphilis but negative in SLE |
| Direct Coomb's Test | - Hemolytic anaemia |

**Other Investigations**

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| Electromyogram | - polymyositis |
| Nerve conduction Study | - Neuropathy, Carpal Tunnel Syndrome |
| Biopsy of specific tissue | - Renal biopsy in Lupus nephritis Muscle Biopsy in Polymyositis |

**Radiology**

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| Joint X-rays | - though infrequently diagnostic, is useful in RA where there may be asymptomatic erosions |
| CXR | - Cavities in Wegener's granulomatosis, Malignancy in HPOA, pulmonary fibrosis in Scl, pleural effusion in RA, Arthrogram for mechanical problems like ruptured popliteal cyst |
| Arteriogram | - Diagnostic features in Takayasu's Aortitis |
| CT Scan and MRI | - Far better visualization of structures |
| Isotope Bone Scan | - lights up inflammed areas |

**Others**

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| HLA B27 | - 90% positive in AS, Reiter's |
| HBSAg | - May be the cause of vasculitis |
| Cryoglobulins | - clinical picture of vasculitis |

This article tries to give a simple overview of the approach to arthritis and rheumatism. Indeed, by using the traditional techniques of history, physical examination and simple investigations as suggested above we can often diagnose the common rheumatic diseases. The patients with conditions which remain undiagnosed should be carefully followed up for development of new signs and symptoms. A specialist opinion may then be sought.

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