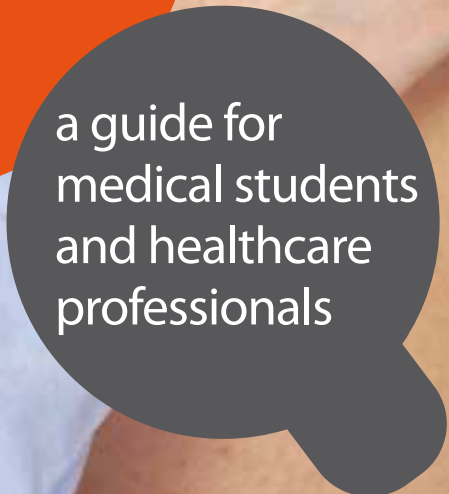
A close-up photograph of a person's back and shoulder area. A healthcare professional's hands are visible, one resting on the shoulder and the other on the lower back, suggesting a physical examination or massage. The background is a soft, out-of-focus light color.

# **Clinical assessment of the musculoskeletal system**

A dark grey speech bubble with a white drop shadow, containing text.

a guide for  
medical students  
and healthcare  
professionals



# Clinical assessment of the musculoskeletal system:

a guide for medical students and healthcare professionals

## Contents

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Foreword	3
Acknowledgements	3
List of abbreviations used	4

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<b>Introduction to musculoskeletal assessment</b>	<b>5</b>
---	----------

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<b>The musculoskeletal history</b>	<b>5</b>
– Current symptoms	7
– Evolution of the problem: is it acute or chronic?	9
– Involvement of other systems	9
– Impact of the condition on the patient	9
– Screening questions for musculoskeletal disorders	10

---

<b>The musculoskeletal examination</b>	<b>11</b>
– Screening examination for musculoskeletal disorders ('GALS')	11
– Gait	11
– Arms	11
– Legs	13
– Spine	13
– Recording the findings from the screening examination	13
– Performing a regional examination of the musculoskeletal system ('REMS')	14
– Examination of the hand and wrist	16
– Examination of the elbow	18
– Examination of the shoulder	18
– Examination of the hip	19
– Examination of the knee	20
– Examination of the foot and ankle	22
– Examination of the spine	23
– Recording the findings from the regional examination	24

---

<b>Investigations</b>	<b>25</b>
– Imaging of bones and joints	25
– Blood tests	26
– Synovial fluid analysis	26

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<b>Conclusion</b>	<b>26</b>
– Appendix 1: Revision checklists	27
– Appendix 2: The core set of regional musculoskeletal examination skills appropriate for a medical student at the point of qualification	31

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– Bibliography	32
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Arthritis Research UK  
Copeman House, St Mary's Court  
St Mary's Gate, Chesterfield  
Derbyshire S41 7TD

Registered Charity England and Wales No. 207711,  
Scotland No. SC041156

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## Foreword

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Arthritis Research UK is delighted to offer this updated version of the guide to clinical assessment of patients with musculoskeletal disorders. The guide should prove an invaluable aid to medical, nursing and allied healthcare professional students.

The guide has evolved from an idea developed by Professor Paul Dieppe while a hostage in Kuwait in 1990. From its inception, the guide included the 'GALS' musculoskeletal screening examination, developed by Professor Dieppe and Professor Mike Doherty in the early 1990s. The GALS, firstly, has proved an excellent method of identifying patients with potential neuromuscular disorders, and secondly, has been an invaluable vehicle in drawing to the attention of healthcare students the importance of identifying patients with musculoskeletal problems. It is now included in many OSCE examinations.

The next iteration of the guide included the innovative work of Dr David Coady and colleagues, highlighting, in the regional examination of the musculoskeletal system ('REMS'), core techniques of musculoskeletal assessment, as identified in a robust study of a wide spectrum of clinicians across the UK. This guide also included a DVD demonstrating the examination techniques.

In the latest version, Drs Coady and Mark Lillicap have made refinements to the previous guide in the light of feedback and experience, but have also included a re-structuring to reflect more closely the sequence of events in clinical practice.

We hope the guide will facilitate confidence and competence in assessing people with musculoskeletal problems – a key activity in ensuring effective care of this very large group of patients.

Professor Andrew Hassell  
Chairman Education Strategy Committee 2005–2011

## Acknowledgements

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We remain indebted, in particular, to Professor Paul Dieppe – his earlier version of this handbook has been widely referred to by medical students in the UK since 1991 and his text remains influential in this new edition.

### **Caution regarding infection control**

The photographs and videos used in this handbook were produced before the introduction of current UK guidelines on infection control ('bare below the elbows' guidelines). Before examining a patient, and in any clinical situation, wrist watches and wrist jewellery should be removed, sleeves should be rolled up above the elbow, ties should be tucked in or removed, and appropriate hand hygiene should be undertaken.

## List of abbreviations used

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<b>CMC(J)</b>	carpometacarpal (joint)	<b>MRI</b>	magnetic resonance imaging
<b>CT</b>	computerized tomography	<b>MTP(J)</b>	metatarsophalangeal (joint)
<b>DEXA</b>	dual-energy x-ray absorptiometry	<b>NSAID</b>	non-steroidal anti-inflammatory drug
<b>DIP(J)</b>	distal interphalangeal (joint)	<b>OA</b>	osteoarthritis
<b>ESR</b>	erythrocyte sedimentation rate	<b>PIP(J)</b>	proximal interphalangeal (joint)
<b>GALS</b>	gait, arms, legs and spine	<b>RA</b>	rheumatoid arthritis
<b>MCP(J)</b>	metacarpophalangeal (joint)	<b>REMS</b>	regional examination of the musculoskeletal system

## Introduction to musculoskeletal assessment

---

Musculoskeletal disorders are the commonest cause of disability in the UK. Each year 15 per cent of patients on a general practitioner's list will consult their doctor with a locomotor problem, and such conditions form 20–25 per cent of a GP's workload. About 30 per cent of those with any physical disability, and 60 per cent of those with a severe disability, have a musculoskeletal disorder as the primary cause of their problems.

Clinical skills – i.e. competent history taking and examination – are the key to making an accurate diagnosis and assessment of a patient complaining of joint problems. This booklet aims to outline the methods you might use. It is not intended to replace clinical teaching and experience but to be used as an aid to learning.

'Arthritis' is a term that is frequently used to describe any joint disorder (and not infrequently any musculoskeletal problem). It could be argued that the term 'arthritis' should be used to describe inflammatory disorders of the joint whilst 'arthropathy' should be used to describe non-inflammatory disorders. Other musculoskeletal problems should similarly be described according to their anatomical site (e.g. muscle or tendon) and whether they are of inflammatory or non-inflammatory aetiology. However, the term 'arthritis' is in such widespread general use to describe any disorder of the joint that, for the purpose of this guide, it will be used in that sense.

There are over 200 different types of 'arthritis' (both inflammatory and

non-inflammatory) and, in general, it is not necessary for a practising clinician to know about all of these. A more realistic approach is to adopt a classification scheme, and to learn how to place patients' problems within this classification, using information gained through a full history and examination (as described in detail in the sections which follow).

The five key questions which need to be answered are:

- Does the problem arise from the joint, tendon or muscle?
- Is the condition acute or chronic?
- Is the condition inflammatory or non-inflammatory?
- What is the pattern of affected areas/joints?
- What is the impact of the condition on the patient's life?

The answers to these questions should enable you to produce a succinct summary of the patient's condition. An example of a patient summary produced using this method might be:

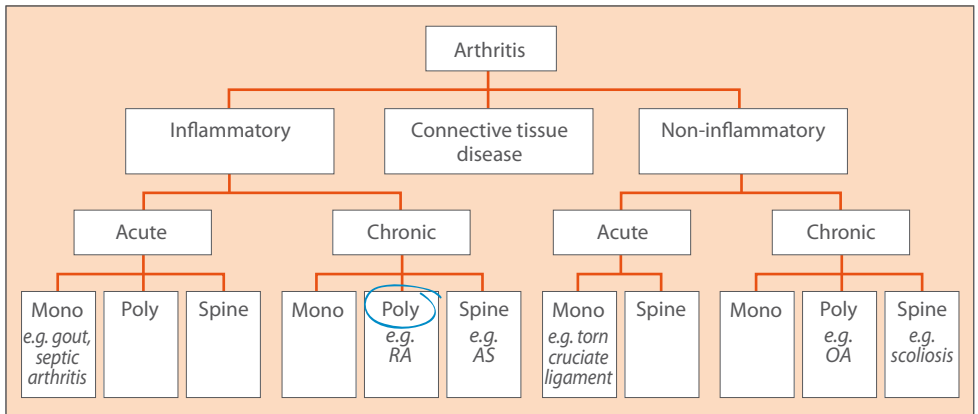
'This patient has a chronic symmetrical inflammatory polyarthritis, mainly affecting the small joints of the hands and feet, which is causing pain, difficulty with dressing and hygiene, and is limiting her mobility.'

This would result in the patient being placed as indicated on the classification tree (see Figure 1).

## The musculoskeletal history

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History taking is one of the most important skills for any doctor or practitioner to



**Figure 1. Classification of the arthritides**

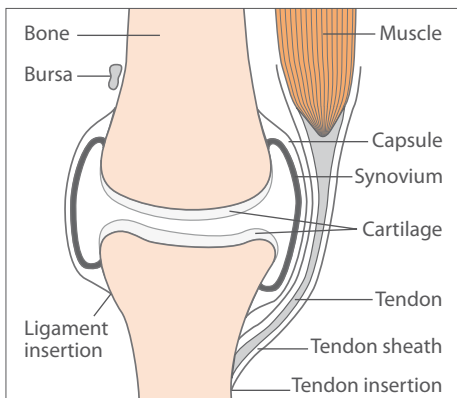
acquire and this can only be achieved through regular practice.

This handbook is primarily concerned with problems arising from the joints – that is from the articular and periarticular structures. (These structures are shown in Figure 2, while Figure 3 represents diagrammatically the changes which occur in the two main types of arthritis.)

However, it is clearly important to

identify those cases where pain may appear to arise from the joint but is in fact referred pain – for example, where the patient describes pain in the left shoulder, which might in fact be referred pain from the diaphragm, the neck, or perhaps ischaemic cardiac pain. In cases where examination reveals no abnormalities in the joint, other clues will be obtained by taking a full history.

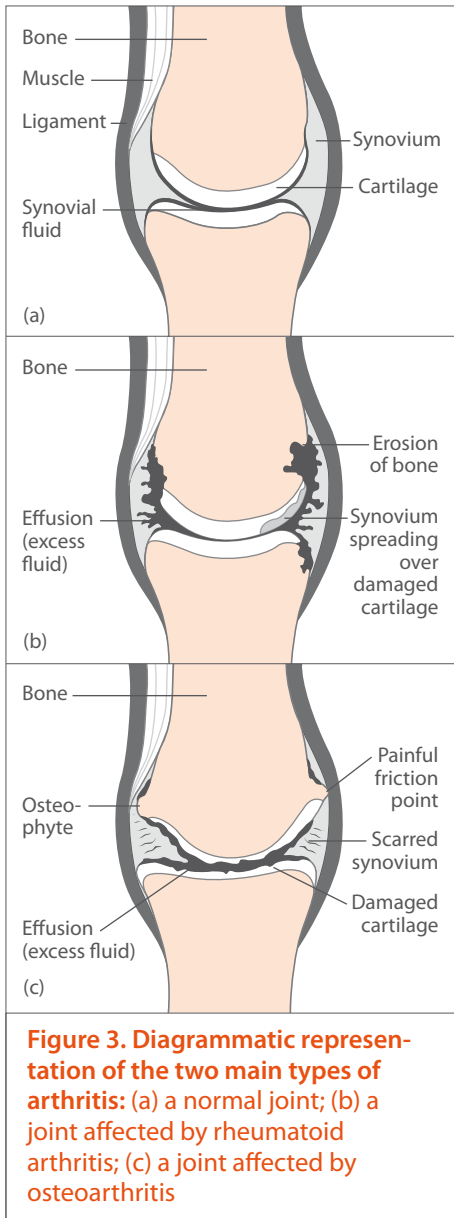
Assuming the patient’s problems do arise from the joint(s), the aims of the history will be to differentiate between inflammatory and degenerative/mechanical problems, to identify patterns that may help with the diagnosis, and to assess the impact of the problem upon the patient. There are four important areas which need to be covered when taking a musculoskeletal history:



**Figure 2. Cross-sectional diagram of a synovial joint and its periarticular structures**

- the current symptoms
- the evolution of the problem (is it acute or chronic?)
- the involvement of other systems
- the impact of the disease on the person’s life.





The assessment of these four areas is discussed in the sections which follow.

## Current symptoms

The main symptoms of musculoskeletal conditions are **pain, stiffness** and **joint**

**swelling** affecting one or more joints. Assessment of the patient's current symptoms may allow differentiation to be made between inflammatory and non-inflammatory conditions. Inflammatory joint conditions are frequently associated with prolonged early morning stiffness that eases with activity, whilst non-inflammatory conditions are associated with pain more than stiffness, and the symptoms are usually exacerbated by activity.

## Pain

As with all pain, it is important to record the **site, character, radiation, and aggravating and relieving factors**. Patients may localize their pain accurately to the affected joint, or they may feel it radiating from the joint or even into an adjacent joint. In the shoulder, for example, pain from the acromioclavicular joint is usually felt in that joint, whereas pain from the glenohumeral joint or rotator cuff is usually felt in the upper arm. Pain from the knee may be felt in the hip or the ankle. Pain due to irritation of a nerve will be felt in the distribution of the nerve – as in sciatica, for example. The pain may localize to a structure near rather than in the joint – for example, the pain from tennis elbow will usually be felt on the outside of the elbow joint.

The character of the pain is sometimes helpful. Pain due to pressure on nerves often has a combination of numbness and tingling associated with it. However, the character of musculoskeletal pain can be very variable and is not always helpful in making a diagnosis.

Pain of a non-inflammatory origin is more directly related to use: the more you do the worse it gets. Pain caused by

inflammation is often present at rest as well as on use, and tends to vary from day to day and from week to week in an unpredictable fashion. It flares up and then it settles down. Severe bone pain is often unremitting and persists through the night, disturbing the patient's sleep.

### Stiffness

In general, inflammatory arthritis is associated with prolonged morning stiffness which is generalized and may last for several hours. The duration of the morning stiffness is a rough guide to the activity of the inflammation. Commonly, patients with inflammatory disease will also describe worse stiffness in the evening as part of a diurnal variation. With inflammatory diseases such as rheumatoid arthritis (RA), where joint destruction occurs over a prolonged period, the inflammatory component may eventually become less active and the patient may then only complain of brief stiffness in the morning. In contrast, osteoarthritis (OA) causes localized stiffness in the affected joints which is short-lasting (less than 30 minutes) but recurs after periods of inactivity. It is sometimes difficult for patients to distinguish between pain and stiffness, so your questions will need to be specific. It may help to remind the patient that stiffness means difficulty in moving the joint.

### Joint swelling

A history of joint swelling, especially if it is intermittent, is normally a good indication of an inflammatory disease process – but there are exceptions. Nodal osteoarthritis, for example, causes bony, hard and non-tender swelling in the proximal interphalangeal (PIP) and distal interphalangeal (DIP) joints of the fingers. Swelling of the knee is also less suggestive

of inflammatory disease as it can also occur with trauma and in OA. Ankle swelling is a common complaint, but this is more commonly due to oedema than to swelling of the joint.

### Pattern of joint involvement

The pattern of joint involvement is very helpful in defining the type of arthritis, as different patterns are associated with different diseases. Common patterns of joint involvement include:

**Monoarticular** – only one joint affected

**Pauciarticular** (or oligoarticular) – less than four joints affected

**Polyarticular** – a number of joints affected

**Axial** – the spine is predominantly affected

As well as the **number of joints** affected, it is useful to consider whether the **large or small joints** are involved, and whether the pattern is **symmetrical or asymmetrical**. Rheumatoid arthritis, for example, is a polyarthritis (it affects lots of joints) which tends to be symmetrical (if it affects one joint it will affect the same joint on the other side), and if it affects one of a group of joints it will often affect them all, for example, the MCP joints. *Note, however, that this describes established disease and early RA can affect any pattern of joints.* Spondyloarthritides, such as psoriatic arthritis, are more likely to be asymmetrical and may be associated with inflammatory symptoms, such as early morning stiffness, involving the spine. Osteoarthritis tends to affect weight-bearing joints and the parts of the spine that move most (lumbar and cervical).

## Evolution of the problem: is it acute or chronic?

You will need to listen to the patient's history to find out:

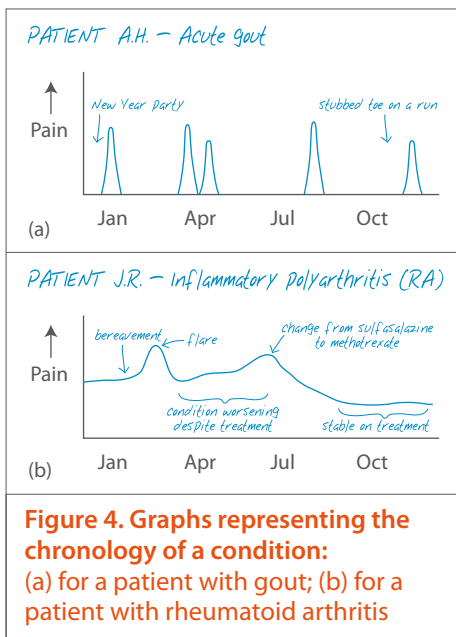
- When did the symptoms start and how have they evolved? Was the onset sudden or gradual?
- Was the onset associated with a particular event, e.g. trauma or infection?
- Which treatments has the condition responded to?

The way in which symptoms evolve and respond to treatment can be an important guide in making a diagnosis. Gout, for example, is characterized by acute attacks – these often start in the middle of the night, become excruciatingly painful within a few hours, and respond well to non-steroidal anti-inflammatory drugs (NSAIDs).

Musculoskeletal symptoms lasting more than 6 weeks are generally described as chronic. Chronic diseases may start insidiously and may have a variable course with remissions and exacerbations influenced by therapy and other factors. It may be helpful to represent the chronology of a condition graphically (see Figure 4).

### Involvement of other systems

Inflammatory arthropathies often involve other systems including the skin, eyes, lungs and kidneys. In addition, patients with inflammatory disease often suffer from general symptoms such as malaise, weight loss, mild fevers and night sweats. Fatigue and depression are also common. Osteoarthritis in contrast is limited to the musculoskeletal system. A comprehensive history must include the usual screening



questions for all systems as well as specific enquiries relating to known complications of specific musculoskeletal disorders.

The presence of an arthritis does not exclude other diseases, and these other conditions may affect both the patient and their arthritis. A combination of two disabling diseases will be worse than either one alone, and the impact on the patient will therefore be greater. In addition, other conditions may be affected by the treatments prescribed for the arthritis – for example, the presence of liver disease may limit the use of disease-modifying drugs for inflammatory arthritis, because most of these drugs can upset the liver.

### Impact of the condition on the patient

Understanding the impact of the disease on the patient is crucial to negotiating a suitable management plan. Ask open

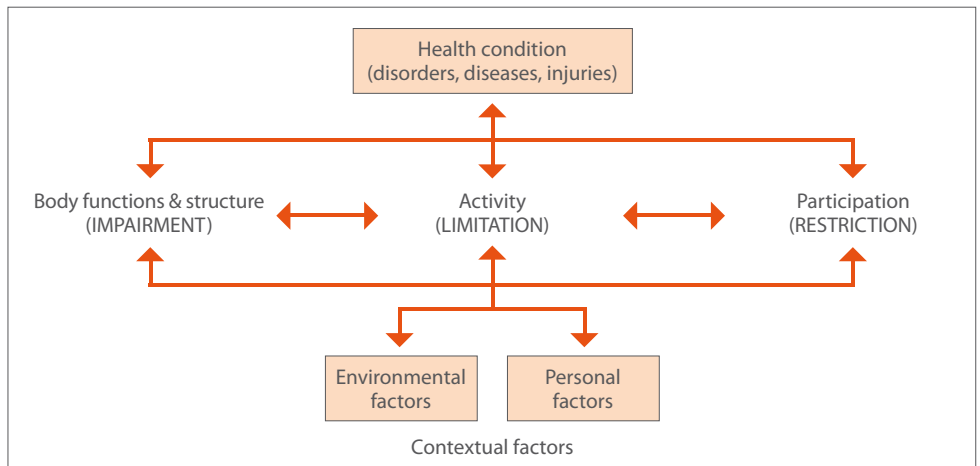
questions about functional problems and difficulty in doing things. It may be easiest to get the patient to describe a typical day, from getting out of bed to washing, dressing, toileting etc. Potentially sensitive areas, such as hygiene or sexual activity, should be approached with simple, direct, open questions. The impact of the disease on the patient's employment will be important.

A patient's needs and aspirations are an important part of the equation and will influence their ability to adapt to the condition. Questions concerning the things a person would like to do, but is currently unable to, may pinpoint key problems. Later negotiations with the patient on balancing the risks and benefits of an intervention will be greatly affected by the patient's priorities for treatment.

Medical students, doctors and practitioners should have an awareness of the relationship between **functional loss**, **limitation of activity**, and **restriction of participation**. Being unable to fully flex a finger (loss of function) might lead to difficulty, for example, with fastening buttons (activity) which might have a fairly minor impact on general life (participation). The same loss of function, however, might prevent a pianist from playing (activity) which, for a professional musician, might have a significant impact on his/her way of life (participation) (see Figure 5).

### Screening questions for musculoskeletal disorders

These screening questions should be incorporated into the routine systemic enquiry of every patient. The main symptoms arising from disorders of the mus-



**Figure 5. A model of disability – the relationship between loss of function, limitation of activity and restriction of participation.** Based on the World Health Organization's International Classification of Functioning, Disability and Health. Disability and function are the result of the interactions between a health condition and contextual factors (environmental and personal factors).

culoskeletal system are **pain, stiffness, swelling**, and associated **functional problems**. The screening questions directly address these aspects:

- 'Do you have any pain or stiffness in your muscles, joints or back?'
- 'Can you dress yourself completely without any difficulty?'
- 'Can you walk up and down stairs without any difficulty?'

A patient who has no pain or stiffness, and no difficulty with dressing or with climbing stairs is unlikely to be suffering from any significant musculoskeletal disorder. If the patient does have pain or stiffness, or difficulty with either of these activities, then a more detailed history should be taken (as described above).

## The musculoskeletal examination

### Screening examination for musculoskeletal disorders ('GALS')

A brief screening examination, which takes 1–2 minutes, has been devised for use in routine clinical assessment. This has been shown to be highly sensitive in detecting significant abnormalities of the musculoskeletal system. It involves inspecting carefully for joint swelling and abnormal posture, as well as assessing the joints for normal movement.

This screening examination is known by the acronym 'GALS', which stands for **Gait, Arms, Legs** and **Spine**. The sequence in which these four elements are assessed can be varied – in practice, it is usually more convenient to complete the el-

ements for which the patient is weight-bearing before asking the patient to climb onto the couch (this is the approach adopted in the accompanying DVD).

#### Gait

- Ask the patient to walk a few steps, turn and walk back. Observe the patient's gait for symmetry, smoothness and the ability to turn quickly.
- With the patient standing in the anatomical position, observe from behind, from the side, and from in front for: bulk and symmetry of the shoulder, gluteal, quadriceps and calf muscles; limb alignment; alignment of the spine; equal level of the iliac crests; ability to fully extend the elbows and knees; popliteal swelling; abnormalities in the feet such as an excessively high or low arch profile, clawing/retraction of the toes and/or presence of hallux valgus (see Figure 6).

#### Arms

- Ask the patient to put their hands behind their head. Assess shoulder abduction and external rotation, and elbow flexion (these are often the first movements to be affected by shoulder problems).
- With the patient's hands held out, palms down, fingers outstretched, observe the backs of the hands for joint swelling and deformity.
- Ask the patient to turn their hands over. Look at the palms for muscle bulk and for any visual signs of abnormality.
- Ask the patient to make a fist. Visually assess power grip, hand and wrist function, and range of movement in the fingers.
- Ask the patient to squeeze your fingers. Assess grip strength.

**Figure 6. With the patient in the anatomical position, observe from behind, from the side, and from the front, checking for:**

Full elbow extension \_\_\_\_\_

Quadriceps bulk and symmetry \_\_\_\_\_

Forefoot abnormalities \_\_\_\_\_

Shoulder muscle bulk and symmetry \_\_\_\_\_

Spinal alignment \_\_\_\_\_

Gluteal muscle bulk and symmetry \_\_\_\_\_

Popliteal swelling or abnormalities \_\_\_\_\_

Calf muscle bulk and symmetry \_\_\_\_\_

Hindfoot abnormalities \_\_\_\_\_

Cervical lordosis \_\_\_\_\_

Thoracic kyphosis \_\_\_\_\_

Lumbar lordosis \_\_\_\_\_

Knee flexion/hyperextension \_\_\_\_\_



- Ask the patient to bring each finger in turn to meet the thumb. Assess fine precision pinch (this is important functionally).
- Gently squeeze across the metacarpophalangeal (MCP) joints to check for tenderness suggesting inflammatory joint disease. (Be sure to watch the patient's face for non-verbal signs of discomfort.)

## Legs

- With the patient lying on the couch, assess full flexion and extension of both knees, feeling for crepitus.
- With the hip and knee flexed to 90°, holding the knee and ankle to guide the movement, assess internal rotation of each hip in flexion (this is often the first movement affected by hip problems).
- Perform a patellar tap to check for a knee effusion. Slide your hand down the thigh, pushing down over the suprapatellar pouch so that any effusion is forced behind the patella. When you reach the upper pole of the patella, keep your hand there and maintain pressure. Use two or three fingers of the other hand to push the patella down gently (see Figure 7). Does it bounce and 'tap'? This indicates the presence of an effusion.
- From the end of the couch, inspect the feet for swelling, deformity, and callosities on the soles.
- Squeeze across the metatarsophalangeal (MTP) joints to check for tenderness suggesting inflammatory joint disease. (Be sure to watch the patient's face for signs of discomfort.)

## Spine

- With the patient standing, inspect the spine from behind for evidence of scoliosis, and from the side for abnormal lordosis or kyphosis.



**Figure 7. Patellar tap test.** Slide your hand down the patient's thigh, compressing the suprapatellar pouch. This forces any effusion behind the patella. With two or three fingers of the other hand push the patella down gently. In a positive test the patella will bounce and tap.

- Ask the patient to tilt their head to each side, bringing the ear towards the shoulder. Assess lateral flexion of the neck (this is sensitive in the detection of early neck problems).
- Ask the patient to bend to touch their toes. This movement is important functionally (for dressing) but can be achieved relying on good hip flexion, so it is important to palpate for normal movement of the vertebrae. Assess lumbar spine flexion by placing two or three fingers on the lumbar vertebrae. Your fingers should move apart on flexion and back together on extension (see Figure 8).

## Recording the findings from the screening examination (GALS)

It is important to record both positive and negative findings in the notes. The presence or absence of changes – in appearance or movement – in the gait, arms, legs or spine should be noted in a grid. Figure 9(a) shows a normal result. If there are abnormalities, these should be recorded with a cross, and a note should



**Figure 8. Assessing lumbar spine flexion.** Place two or three fingers on the lumbar vertebrae. Your fingers should move apart on flexion and back together on extension.

be made describing the abnormalities – for a patient with wrist and knee swelling and associated loss of movement the recording might be as shown in Figure 9(b).

If you have been alerted to a musculo-skeletal problem – by the screening questions, your examination or the spontaneous complaints of the patient – you will need to take a detailed history (as described above). You should also conduct a regional examination of relevant joints – this is described in the sections which follow.

### Performing a regional examination of the musculoskeletal system ('REMS')

Regional examination of the musculo-skeletal system refers to the more detailed examination that should be carried out

(a)	Appearance	Movement
Gait	✓	
Arms	✓	✓
Legs	✓	✓
Spine	✓	✓

(b)	Appearance	Movement
Gait	✓	
Arms	✗	✗
Legs	✗	✗
Spine	✓	✓

*Swelling over dorsum of both wrists and knee effusions - early RA?*

**Figure 9. Recording the findings from the GALS screening examination:** (a) a normal result; (b) the results for a patient with wrist and knee swelling and associated loss of movement.

once an abnormality has been detected either through the history or through the screening examination (GALS). REMS involves the examination of a group of joints which are linked by function, and may require a detailed neurological and vascular examination.

REMS was born out of a desire to standardize examination of the musculoskeletal system, allowing for more systematic teaching and learning. It was developed through a national consensus process involving UK consultants in rheumatology, orthopaedics and care of the elderly and selected general practitioners. It led to an agreed set of 'core' skills (see Appendix 2). It is important to note, however, that a number of other specific tests may be used by musculoskeletal practitioners as an adjunct to the REMS examination.



There are five key stages which need to be completed during an examination of the joints in any part of the body:

- Introduce yourself.
- Look at the joint(s).
- Feel the joint(s).
- Move the joint(s).
- Assess the function of the joint(s).

## Introduction

It is important to introduce yourself, explain to the patient what you are going to do, gain verbal consent to examine, and ask the patient to let you know if you cause them any pain or discomfort at any time. In all cases it is important to make the patient feel comfortable about being examined. A good musculoskeletal examination relies on patient cooperation, in order for them to relax their muscles, if important clinical signs are not to be missed.

## Look

The examination should always start with a visual inspection of the exposed area at rest. Compare one side with the other, checking for symmetry. You should look specifically for skin changes, muscle bulk, and swelling in and around the joint. Look also for deformity in terms of alignment and posture of the joint.

## Feel

Using the back of your hand, feel for skin temperature across the joint line and at relevant neighbouring sites. Any swellings should be assessed for fluctuance and mobility. The hard bony swellings of osteoarthritis should be distinguished from the soft, rubbery swellings of inflammatory joint disease. Tenderness is an important clinical sign to elicit – both

in and around the joint. Identifying inflammation of a joint (synovitis) relies on detecting the triad of **warmth, swelling and tenderness**.

## Move

The full range of movement of the joint should be assessed. Compare one side with the other. As a general rule both active movements (where the patient moves the joint themselves) and passive movements (where the examiner moves the joint) should be performed. If there is a loss of active movement, but passive movement is unaffected, this may suggest a problem with the muscles, tendons or nerves rather than in the joints, or it may be an effect of pain in the joints. In certain instances joints may move further than expected – this is called hypermobility.

It is important to elicit a loss of full flexion or a loss of full extension as either may affect function. A loss of movement should be recorded as mild, moderate or severe. The quality of movement should be recorded, with reference to abnormalities such as increased muscle tone or the presence of crepitus.

## Function

It is important to make a functional assessment of the joint – for example, in the case of limited elbow flexion, does this make it difficult for the patient to bring their hands to their mouth? In the case of the lower limbs, function mainly involves gait and the patient's ability to get out of a chair.

For the purposes of this handbook (and the accompanying DVD) the REMS examination has been divided into seven areas, each of which is described in detail below. However, it should be remembered that this is an artificial division and that one

group of joints may need to be examined in conjunction with another group (e.g. the shoulder and cervical spine).

### Examination of the hand and wrist

This should normally take place with the patient's hands resting on a pillow as it can be painful for patients with elbow or shoulder problems to hold their hands up for long.

#### Look

*With the patient's hands palms down:*

- Look at the posture and for obvious swelling, deformity, muscle wasting and scars.
- Look at the skin for thinning and bruising (signs of long-term steroid use) or rashes.
- Look at the nails for psoriatic changes such as pitting or onycholysis (see Figure 10), and evidence of nailfold vasculitis.
- Decide whether the changes are symmetrical or asymmetrical.
- Do the changes mainly involve the small joints – PIPs and DIPs, MCPs, or the wrists?

*Ask the patient to turn their hands over:*

- Does the patient have problems with this due to radioulnar joint involvement?



**Figure 10. Fingernails affected by psoriasis: (a) pitting; (b) onycholysis**

*With the patient's hands palms up:*

- Look again for muscle wasting – if present, is it in both the thenar and hypothenar eminences? If it is only in the thenar eminence, then perhaps the patient has carpal tunnel syndrome. Look for signs of palmar erythema. Look at the wrist for a carpal tunnel release scar.

#### Feel

*With the patient's hands palms up:*

- Feel for peripheral pulses.
- Feel for bulk of the thenar and hypothenar eminences and for tendon thickening.
- Assess median and ulnar nerve sensation by gently touching over both the thenar and hypothenar eminences, and the index and little fingers respectively – is sensation normal and equal?

*Ask the patient to turn their hands back over, so their palms are face down:*

- Assess radial nerve sensation by light touch over the thumb and index finger web space.
- Using the back of your hand, assess skin temperature at the patient's forearm, wrist and MCP joints. Are there differences?
- Gently squeeze across the row of MCP joints to assess for tenderness (watching the patient's face for signs of discomfort).
- Bimanually palpate any MCP joints and any PIP or DIP joints that appear swollen or painful. Is there evidence of active synovitis? (The joints will be warm, swollen and tender and may have a 'rubbery' feel, or you may even detect effusions).

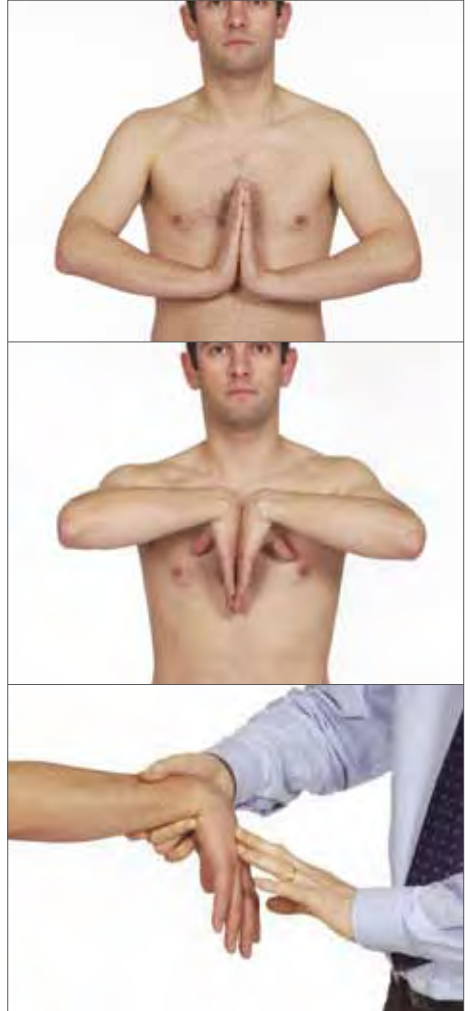
- Are there hard, bony swellings? Check for squaring of the carpometacarpal (CMC) joint of the thumb and for Heberden's nodes on the DIPs. There may be evidence of previous synovitis (thickened, rubbery but non-tender joints).
- Compare one joint with another, or with your own, to decide whether the small joints are normal.
- Bimanually palpate the patient's wrists.
- Finally run your hand up the patient's arm along the ulnar border to the elbow. Feel and look for rheumatoid nodules or psoriatic plaques on the extensor surfaces.

### Move

- Ask the patient to straighten their fingers fully (against gravity). If the patient is unable to do this it may be due to joint disease, extensor tendon rupture or neurological damage – this can be assessed by moving the fingers passively.
- Ask the patient to make a fist. If they have difficulty tucking the fingers into the palm, this may be an early sign of tendon or small joint involvement. Move the fingers passively to assess whether the problem is with the tendon or nerves, or in the joint.
- Assess wrist flexion and extension actively (e.g. by making the 'prayer' sign) and passively (see Figure 11).
- In patients where the history and examination suggest carpal tunnel syndrome perform *Phalen's test* (forced flexion of the wrists for 60 seconds) – in a positive test this reproduces the patient's symptoms.
- Assess the median and ulnar nerves for power. This can be done by abduction of the thumb, and finger spread, respectively.

### Function

- Ask the patient to grip your two fingers to assess power grip.
- Ask the patient to pinch your finger. This assesses pincer grip, which is very important functionally.



**Figure 11. The 'prayer sign' assesses wrist flexion and extension.** If the patient's history and examination suggest carpal tunnel syndrome, Phalen's test (forced flexion of the wrist for 60 seconds) may reproduce the patient's symptoms.

- Ask the patient to pick a small object such as a coin out of your hand or check their ability to undo buttons. This assesses pincer grip and function.

## Examination of the elbow

### Look

- Look from the front for the carrying angle, and from the side for flexion deformity.
- Look for scars, rashes, muscle wasting, rheumatoid nodules, psoriatic plaques, and swellings such as olecranon bursitis.

### Feel

- Using the back of your hand, feel the temperature across the joint and the forearm.
- Hold the forearm with one hand and, with the elbow flexed to 90°, palpate the elbow, feeling the head of the radius and the joint line with your thumb. If there is swelling, is it fluctuant? Synovitis is usually felt as a fullness between the olecranon and the lateral epicondyle.
- Palpate the medial and lateral epicondyles (for golfer's and tennis elbow respectively) and the olecranon process for tenderness and evidence of bursitis.

### Move

- Does the elbow extend fully and flex fully? Assess both actively and passively, and compare one side with the other.
- Assess pronation and supination, both actively and passively, feeling for crepitus.

### Function

- An important function of the elbow is to allow the hand to reach the mouth. Other functionally important

movements (such as hands behind head) will have been assessed during the screening examination.

## Examination of the shoulder

### Look

- With the shoulder fully exposed, inspect the patient from the front, from the side and from behind, checking for symmetry, posture, muscle wasting and scars.

### Feel

- Assess the temperature over the front of the shoulder.
- Palpate the bony landmarks for tenderness, starting at the sternoclavicular joint, then the clavicle, acromioclavicular joint, acromion process and around the scapula.
- Palpate the joint line – anterior and posterior.
- Palpate the muscle bulk of the supraspinatus, infraspinatus and deltoid muscles.

### Move

- Ask the patient to put their hands behind their head to assess external rotation, and then behind their back to assess internal rotation, comparing one side with the other. If there is a restriction in the latter movement, describe how far the patient can reach – for example, to the lumbar, lower thoracic or mid-thoracic level.
- With the elbow flexed at 90° and tucked into the patient's side, assess external rotation of the shoulder. Loss of external rotation may indicate a frozen shoulder.
- Ask the patient to raise their arms behind them and to the front. Assess flexion and extension.

- Ask the patient to abduct the arm to assess for a painful arc (between 10° and 120°) (see Figure 12). Can you passively take the arm further? Be sure to assess abduction from behind the patient and observe scapular movement. Restricted glenohumeral movement can be compensated for by scapular/thoracic movements.

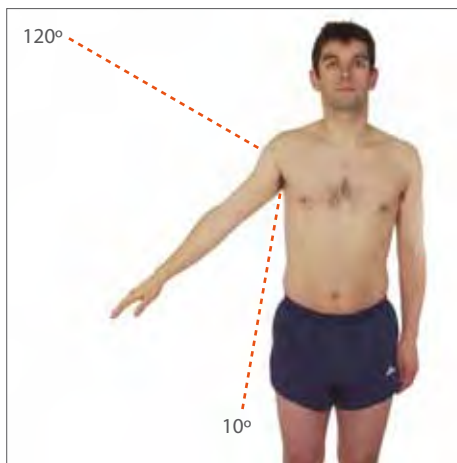
### Function

- Function of the shoulder includes getting the hands behind the head and back. This is important in washing and grooming. If this has not been assessed during the screening examination it should be done now.

### Examination of the hip

#### Look

- With the patient standing, assess for muscle wasting (gluteal muscle bulk in particular).
- With the patient lying flat and face up, observe the legs, comparing one side with the other – is there an obvious flexion deformity of the hip?



**Figure 12. Abduction of the arm to assess for a painful arc**

- If there is a suggestion of leg length disparity, assess true leg lengths using a tape measure. Measurements are taken from the anterior superior iliac crest to the medial malleolus of the ankle on the same side. Compare the measurements. In a fractured neck of femur the leg is shortened and externally rotated.
- Check for scars overlying the hip.

#### Feel

- Palpate over the greater trochanter for tenderness.

#### Move

- With the knee flexed at 90°, assess full hip flexion, comparing one side with the other and watching the patient's face for signs of pain.
- Assess for a fixed flexion deformity of the hip by performing *Thomas' test*. Keep one hand under the patient's back to ensure that normal lumbar lordosis is removed. Fully flex one hip and observe the opposite leg (see Figure 13). If it lifts off the couch then there is a fixed flexion deformity in that hip. (As the pelvis is forced to tilt a normal hip would extend allowing the leg to remain on the couch.)
- With the hip and knee flexed at 90°, assess internal and external rotation of both hips. This is often limited in hip disease.
- Assess the hip and proximal (gluteal) muscle strength by performing the Trendelenberg test. This involves the patient alternately standing on each leg alone. In a negative test the pelvis remains level or even rises. In an abnormal test the pelvis will dip on the contralateral side. (See Figure 14.)

## Function

- Ask the patient to walk – look for an antalgic or Trendelenberg gait. An antalgic gait simply means a painful gait, normally resulting in a limp. A Trendelenberg gait results from proximal muscle weakness and commonly results in a ‘waddling’ walk.

## Examination of the knee

### Look

- From the end of the couch and with the patient’s legs straight, observe the knees, comparing one with the other, for symmetry and alignment.
- Is the posture of the knee normal? Look for valgus deformity – where the leg below the knee is deviated laterally (knock-kneed) – and for varus deformity – where the leg below the knee is deviated medially (bow-legged).
- Check for a knee flexion deformity (distinguishing this from hip flexion deformity by examining hip movements as above).
- Check for muscle wasting or scars.
- Look for redness suggesting inflammation or infection.
- Look for obvious swelling.
- Check for a rash suggesting psoriasis.

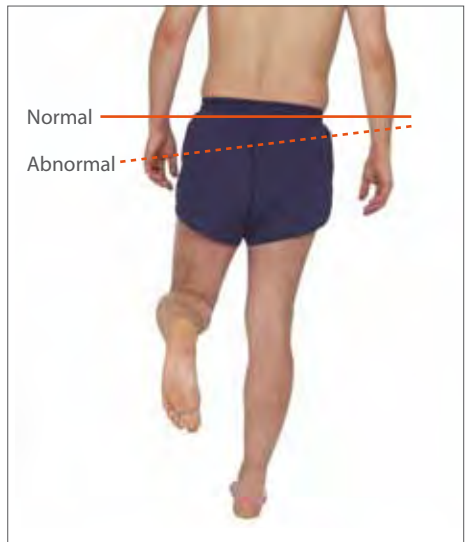
NOTE: Popliteal swellings, varus and valgus deformities may be more apparent with the patient weight-bearing.

### Feel

- Using the back of your hand, feel the skin temperature, starting with the mid-thigh and comparing it to the temperature over the knee. Compare one knee to the other.
- Palpate for tenderness along the borders of the patella.
- With the knee flexed to 90°, palpate for tenderness and swelling along the



**Figure 13. Thomas’ test for fixed flexion deformity of the hip.** Keep one hand under the patient’s back to ensure that there is no lumbar lordosis. Fully flex one hip. If the opposite leg lifts off the couch there is a fixed flexion deformity. (As the pelvis tilts a normal hip would extend allowing the leg to remain on the couch.)



**Figure 14. The Trendelenberg Test assesses hip and gluteal muscle strength. In a normal test the pelvis remains level. In an abnormal test the pelvis dips on the contralateral side.**

joint line from the femoral condyles to the inferior pole of the patella, then down the inferior patella tendon to the tibial tuberosity.

- Feel behind the knee for a popliteal (Baker's) cyst.
- Assess for an effusion by performing a patellar tap, as described for the screening examination (see Figure 7).
- If there is no obvious patellar tap, assess for a fluid bulge by cross fluctuation. Stroke the medial side of the knee upwards (towards the suprapatellar pouch) to empty the medial compartment of fluid, then stroke the lateral side downwards (distally) (see Figure 15). The medial side may refill, and produce a bulge of fluid indicating an effusion.

### **Move**

- Ask the patient to flex the knee as far as possible to assess active movement. Making sure the patient is fully relaxed, assess passive movement. This is done by placing one hand on the knee (feeling for crepitus) and flexing the knee as far as possible, noting the range of movement. Assess full flexion and extension of the knees, comparing one to the other.
- With the knee flexed to 90°, check the stability of the knee ligaments. Look initially from the side of the knee, checking for a posterior sag or step-back of the tibia, suggesting posterior cruciate ligament damage.
- Perform an anterior draw test. Place both hands round the upper tibia, with your thumbs over the tibial tuberosity and index fingers tucked under the hamstrings to make sure these are relaxed. Stabilize the lower tibia with your forearm and gently pull the upper tibia forward (see Figure 16).



**Figure 15. Cross fluctuation ('The Bulge Sign').** Stroke the medial side of the knee upwards towards the suprapatellar pouch. This empties the medial compartment of fluid. Then stroke the lateral side downwards (distally). The medial side may refill and produce a bulge of fluid, indicating the presence of an effusion.

In a relaxed, normal patient there is normally a small degree of movement. More significant movement suggests anterior cruciate ligament laxity.

- Assess medial and lateral collateral ligament stability by flexing the knee to 15° and alternately stressing the joint line on each side. Place one hand on the opposite side of the joint line to that which you are testing, and apply force to the lower tibia (see Figure 17). This may be done with the leg on the couch or with the lower tibia supported on the examiner's pelvis.

### **Function**

- Ask the patient to stand and then walk a few steps, looking again for a varus or valgus deformity (see Figure 18).

## Examination of the foot and ankle

### Look

With the patient sitting on the couch, their feet overhanging the end of it:

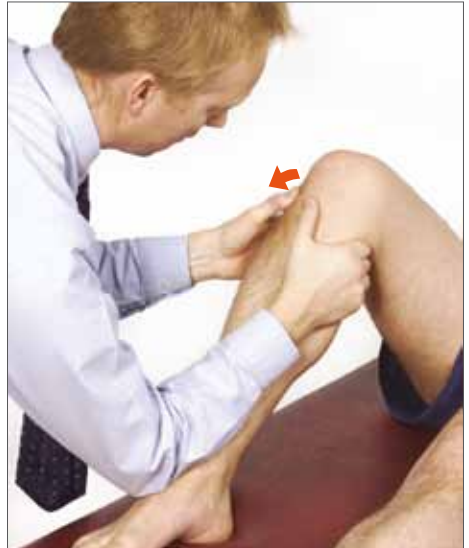
- Observe the feet, comparing one with the other for symmetry.
- Look specifically at the forefoot for nail changes or skin rashes such as psoriasis.
- Look for alignment of the toes and evidence of hallux valgus of the big toe. Look for clawing of the toes, joint swelling and callus formation. If there is clawing of the toes, calluses above and below the MTP joints, pain and restriction of movement, then there is likely to be subluxation (partial dislocation) of the MTP joints.
- Look at the underside or plantar surface for callus formation.
- Look at the patient's footwear. Check for abnormal or asymmetrical wearing of the sole or upper, for evidence of poor fit or the presence of special insoles.

With the patient weight-bearing:

- Look again at the forefoot for toe alignment.
- Look at the midfoot for foot arch position (a dropped arch in a normal subject should resolve when standing on tip toes).
- From behind, look at the hindfoot for Achilles tendon thickening or swelling.
- Look for normal alignment of the hindfoot (see fig. 18). Disease of the ankle or subtalar joint may lead to a varus or valgus deformity.

### Feel

- Assess the temperature over the forefoot, midfoot and ankle.
- Check for the presence of a peripheral pulse.



**Figure 16. Anterior Draw Test.** Place both hands around the upper tibia, with your thumbs over the tibial tuberosity and your index fingers tucked under the hamstrings to make sure these are relaxed. Stabilize the lower tibia with your forearm and gently pull the upper tibia forward. There should normally be a small degree of movement; more substantial movement suggests laxity of the anterior cruciate ligaments.

- Gently squeeze across the MTP joints, watching the patient's face for signs of discomfort.
- Palpate the midfoot, the ankle and subtalar joints for tenderness.

### Move

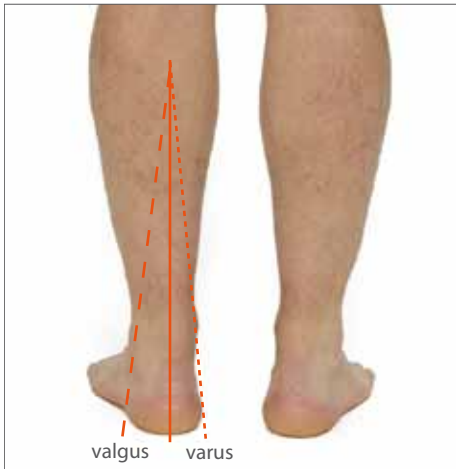
- Assess, both actively and passively, movements of inversion and eversion at the subtalar joint, plus dorsi- and plantar flexion at the big toe and ankle joint.
- Movement of the mid-tarsal joints can also be performed by fixing the heel with one hand and, with the other





**Figure 17. Assessing medial and lateral collateral ligament stability.**

With the patient's leg on the couch or supported on your pelvis, place one hand on the opposite side of the joint line to that which you are testing and alternately stress the joint line on each side by applying gentle force on the tibia.



**Figure 18. With the patient standing, assess for a varus or valgus deformity.**

hand, passively inverting and everting the forefoot.

### *Function*

- If not already done, assess the patient's gait, watching for the normal cycle of heel strike, stance, and toe-off.

### **Examination of the spine**

#### *Look*

- Observe the patient standing. Look initially from behind the patient for any obvious muscle wasting, asymmetry, or scoliosis of the spine.
- Look from the side for normal cervical lordosis, thoracic kyphosis, and lumbar lordosis.

#### *Feel*

- Feel down the spinal processes and over the sacroiliac joints for alignment and tenderness.
- Palpate the paraspinal muscles for tenderness.

#### *Move*

- Assess lumbar flexion and extension by placing two or three fingers over the lumbar spine. Ask the patient to bend to touch their toes. Your fingers should move apart during flexion and back together during extension (see Figure 8).
- Ask the patient to run each hand in turn down the outside of the adjacent leg to assess lateral flexion of the spine.
- Next, assess the cervical spine movements. Ask the patient to: tilt their head to each side, bringing the ear towards the adjacent shoulder (lateral flexion); turn their head to look over each shoulder (rotation); bring their chin towards their chest (flexion); and tilt their head backwards (extension).

- With the patient sitting on the edge of the couch to fix their pelvis and their arms crossed in front of them, assess thoracic rotation (with your hands on the patient's shoulders to guide the movement) (see Figure 19).
- With the patient lying as flat as possible, perform straight leg raising (see Figure 20). Dorsiflexion of the foot with the leg raised may exacerbate the pain from a nerve root entrapment or irritation such as that caused by a prolapsed intervertebral disc.
- Assess limb reflexes (upper and lower) and dorsiflexion of the big toe.

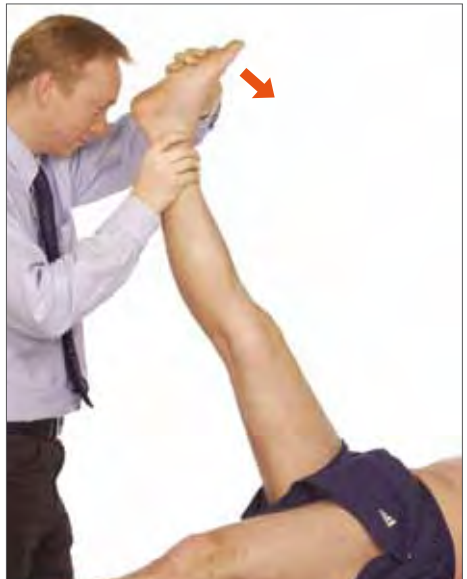
A brief neurovascular examination should be carried out including assessment of upper and lower limb reflexes, dorsiflexion of the big toe, and assessment of peripheral pulses. If there has been any indication from the history of a relevant abnormality, a full neurological and vascular assessment – including sensation, tone and power – should also be made.

### Recording the findings from the regional examination

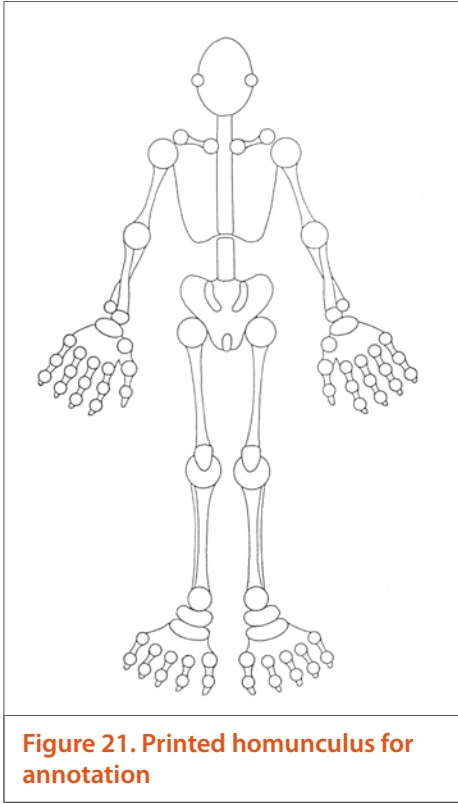
The positive and significant negative findings of the REMS examination are usually documented longhand in the notes. If no abnormality is found then 'REMS normal' is sufficient. You may find it helpful to document joint involvement on a homunculus such as the one shown in Figure 21. The total number of tender and swollen joints can be used for calculating disease activity scores – these are useful in monitoring disease severity and response to treatment over time.



**Figure 19.** With the patient seated on the couch to fix the pelvis, assess thoracic rotation.



**Figure 20.** Dorsiflexion of the foot with the leg straight and raised may exacerbate pain from a nerve root entrapment or prolapsed disc.



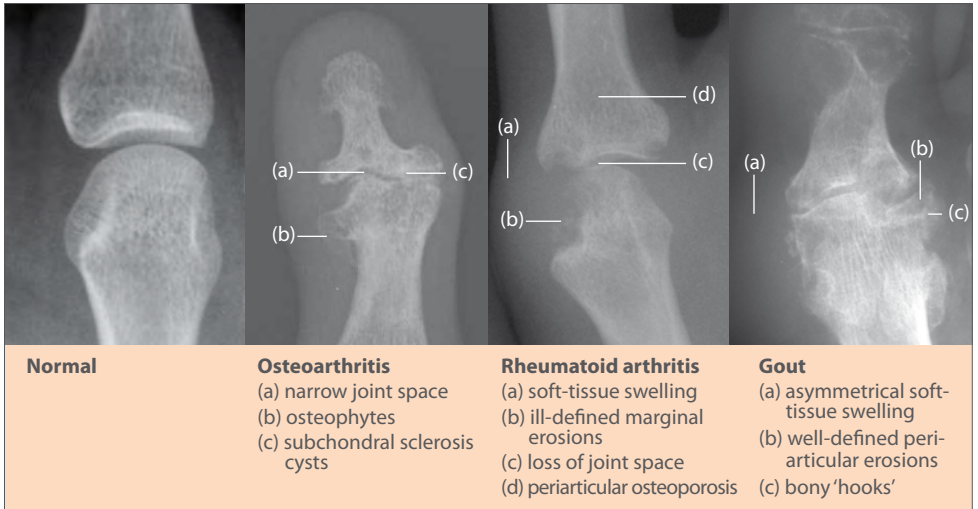
**Figure 21. Printed homunculus for annotation**

## Investigations

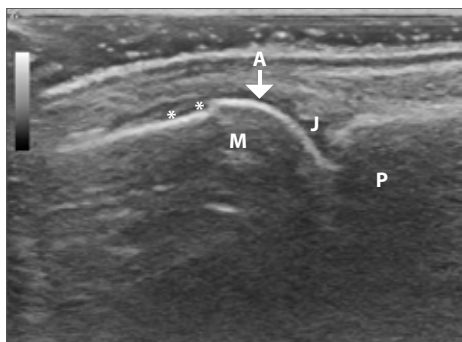
There are three main types of investigations: imaging of bones and joints, blood tests, and synovial fluid analysis.

### Imaging of bones and joints

A plain x-ray of the affected joint is one of the most useful investigations. Changes that occur on plain x-ray can be characteristic of specific musculoskeletal diseases such as rheumatoid arthritis, osteoarthritis and gout (see Figure 22). Most changes occur over a prolonged period of time and x-rays can therefore provide a useful historical record. Ultrasound is becoming increasingly widely used, particularly in identifying early joint inflammation (see Figure 23). Other investigations including magnetic resonance imaging (MRI), computerized tomography (CT) scanning, isotope bone scans and dual-energy x-ray absorptiometry (DEXA) scans (for osteoporosis) all have an important role.



**Figure 22. Diagrammatic representation of x-ray changes seen in chronic rheumatic diseases**



**Figure 23. Ultrasound image of a normal metacarpophalangeal joint.**

M=metacarpal head, P=proximal phalanx, A= articular cartilage, J= joint space, \*\*= synovial joint recess

## Blood tests

Blood tests can be useful in indicating the degree of inflammation and in monitoring response to therapy. The erythrocyte sedimentation rate (ESR) is one of the best-known inflammatory markers and indicates what has been happening over the last few days or longer. It is non-specific and influenced by many things including anaemia. C-reactive protein responds more rapidly to changes in inflammation – normally within days.

A specific biochemical test which may be useful is for serum uric acid, which may be raised in gout, although it may be unreliable during an acute episode.

Many of the inflammatory arthropathies are associated with increased titres of a number of autoantibodies, although their significance is not always clear. Tests for rheumatoid factor, and the more recently used anti-CCP (cyclic citrullinated peptide) antibody test, for example, are both often strongly positive

in patients with rheumatoid arthritis. However, rheumatoid factor may also be positive in other disease states and in the elderly, and is therefore not highly specific. It is also important to consider infection as a cause of an arthropathy, particularly in the case of a single joint – blood cultures for infection should be taken even if there is no fever.

## Synovial fluid analysis

Obtaining a sample of synovial fluid for analysis is an important skill to learn, and is vital to perform in order to exclude infection of a joint. Synovial fluid should be sent for culture and gram staining. If gout or other crystals are considered as a cause of the problem, the fluid is examined for crystals under a polarizing light microscope.

## Conclusion

This handbook, together with the accompanying DVD, has documented the core skills of musculoskeletal examination and history taking. However, the importance of guided clinical teaching cannot be over-emphasized, and it is only through real-life clinical practice that competence and confidence in musculoskeletal clinical examination can be achieved.

We hope that you will find the handbook and DVD valuable for reference and revision, but Arthritis Research UK is always delighted to receive feedback on its publications, and we would be very grateful if you would take the time to complete and return the response form at the back of the booklet, or write to the address shown with your comments.

## Appendix 1: Revision checklists

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For full descriptions of the examination procedures please refer to the relevant sections of the text.

### History Taking

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#### *Current symptoms*

- Pain
- Stiffness
- Swelling
- Pattern of joint involvement

#### *Evolution*

- Acute or chronic?
- Associated events
- Response to treatment

#### *Involvement of other systems*

- Skin, eye, lung or kidney symptoms?
- Malaise, weight loss, fevers, night sweats?

#### *Impact on patient's lifestyle*

- Patient's needs/aspirations
- Ability to adapt to functional loss

### Screening Questions

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- 'Do you have any pain or stiffness in your muscles, joints or back?'
- 'Can you dress yourself completely without any difficulty?'
- 'Can you walk up and down stairs without any difficulty?'

### 'GALS' Screening Examination

---

#### *Gait*

- Observe gait
- Observe patient in anatomical position

#### *Arms*

- Observe movement – hands behind head
- Observe backs of hands and wrists
- Observe palms
- Assess power grip and grip strength
- Assess fine precision pinch
- Squeeze MCPJs

#### *Legs*

- Assess full flexion and extension
- Assess internal rotation of hips
- Perform patellar tap
- Inspect feet
- Squeeze MTPJs

#### *Spine*

- Inspect spine
- Assess lateral flexion of neck
- Assess lumbar spine movement

## 'REMS' General Principles

---

### **Introduction**

- Introduce yourself
- Gain verbal consent to examine

### **Look for:**

- Scars
- Swellings
- Rashes
- Muscle wasting

### **Feel for:**

- Temperature

- Swellings
- Tenderness

### **Move**

- Full range of movement – active and passive
- Restriction – mild, moderate or severe?

### **Function**

- Functional assessment of joint

## Examination of the hand and wrist

---

- Introduce yourself/gain consent to examine
- Inspect hands (palms and backs) for muscle wasting, skin and nail changes
- Check wrist for carpal tunnel release
- Feel for radial pulse, tendon thickening and bulk of thenar and hypothenar eminences
- Assess median, ulnar and radial nerve sensation
- Assess skin temperature
- Squeeze MCPJs

- Bimanually palpate swollen or painful joints, including wrists
- Look and feel along ulnar border
- Assess full finger extension and full finger tuck
- Assess wrist flexion and extension – active and passive
- Assess median and ulnar nerve power
- Assess function: grip and pinch, picking up small object
- Perform Phalen's test (if suggestion of carpal tunnel syndrome)

## Examination of the elbow

---

- Introduce yourself/gain consent to examine
- Look for scars, swellings or rashes
- Assess skin temperature
- Palpate over head of radius, joint line, medial and lateral epicondyles

- Assess full flexion and extension, pronation and supination – actively and passively
- Assess function – e.g. hand to nose or mouth

## Examination of the shoulder

---

- Introduce yourself/gain consent to examine
- Inspect shoulders from in front, from the side and from behind
- Assess skin temperature
- Palpate bony landmarks and surrounding muscles
- Assess movement and function: hands behind head, hands behind back
- Assess (actively and passively) external rotation, flexion, extension and abduction
- Observe scapular movement

## Examination of the hip

---

- Introduce yourself/gain consent to examine

*With the patient lying on couch:*

- Look for flexion deformity and leg length disparity
- Check for scars
- Feel the greater trochanter for tenderness

- Assess full hip flexion, internal and external rotation
- Perform Thomas' test

*With the patient standing:*

- Look for gluteal muscle bulk
- Perform the Trendelenberg test
- Assess the patient's gait

## Examination of the knee

---

- Introduce yourself/gain consent to examine

*With the patient lying on couch:*

- Look from the end of the couch for varus/valgus deformity, muscle wasting, scars and swellings
- Look from the side for fixed flexion deformity
- Assess skin temperature
- With the knee slightly flexed palpate the joint line and the borders of the patella

- Feel the popliteal fossa
- Perform a patellar tap and cross fluctuation (bulge sign)
- Assess full flexion and extension (actively and passively)
- Assess stability of knee ligaments – medial and lateral collateral – and perform anterior draw test

*With the patient standing:*

- Look again for varus/valgus deformity and popliteal swellings
- Assess the patient's gait

## Examination of the foot and ankle

---

- Introduce yourself/gain consent to examine

*With the patient lying on couch:*

- Look at dorsal and plantar surfaces of the foot
- Assess skin temperature
- Palpate for peripheral pulses
- Squeeze the MTPJs
- Palpate the midfoot, ankle joint line and subtalar joint
- Assess movement (actively and passively) at the subtalar joint

(inversion and eversion), the big toe (dorsi- and plantar flexion), the ankle joint (dorsi- and plantar flexion) and mid-tarsal joints (passive rotation)

- Look at the patient's footwear

*With the patient standing:*

- Look at the forefoot, midfoot (foot arch) and the hindfoot
- Assess the gait cycle (heel strike, stance, toe-off)

## Examination of the spine

---

- Introduce yourself/gain consent to examine

*With the patient standing:*

- Inspect from the side and from behind
- Palpate the spinal processes and paraspinal muscles
- Assess movement: lumbar flexion and extension and lateral flexion;

cervical flexion, extension, rotation and lateral flexion

*With the patient sitting on couch:*

- Assess thoracic rotation

*With the patient lying on couch:*

- Perform straight leg raising and dorsiflexion of the big toe
- Assess limb reflexes



## Appendix 2 : The core set of regional musculoskeletal examination skills appropriate for a medical student at the point of qualification (Coady et al 2004)

---

A student at the point of qualification should be able to:

1. detect the difference between bony and soft tissue swelling
2. elicit tenderness around a joint
3. elicit temperature around a joint
4. detect synovitis
5. understand the difference between active and passive movements
6. perform passive and active movements at all relevant joints
7. detect a loss of full extension and a loss of full flexion
8. assess gait
9. correctly use the terms 'varus' and 'valgus'
10. assess limb reflexes routinely – when examining the spine and in other relevant circumstances
11. have an understanding of the term 'subluxation'
12. where appropriate, examine neurological and vascular systems when assessing a problematic joint (check for intact sensation and peripheral pulses)
13. assess leg length with a tape measure when assessing for a real leg length discrepancy
14. make a qualitative assessment of movement (not joint end feel but features such as cog-wheeling)
15. assess the median and ulnar nerves
16. be able to localize tenderness within the joints of the hand (palpate each small joint of the hand if necessary)
17. assess power grip
18. assess pincer grip in the hand
19. make a functional assessment of the hand such as holding a cup
20. correctly use the term 'Heberden's nodes'
21. be able to perform Phalen's test
22. detect a painful arc and frozen shoulder
23. make a functional assessment of the shoulder (can the patient put their hands behind their head and back?)
24. perform external/internal rotation of the shoulder with the elbow flexed to 90° and held in against the patient's side
25. examine a patient's shoulder from behind for scapular movement
26. assess the acromioclavicular joint (by palpation alone)
27. palpate for tenderness over the epicondyles of the elbow
28. palpate for tenderness over the greater trochanter of the hip
29. perform internal and external rotation of the hip with it flexed to 90°
30. perform Trendelenberg test
31. perform Thomas' test
32. detect an effusion at the knee
33. perform a patellar tap
34. demonstrate cross-fluctuation or the bulge sign when looking for a knee effusion
35. test for collateral ligament stability in the knee
36. use the anterior draw test to assess anterior cruciate ligament stability in the knee

37. examine the soles of a patient's feet
38. recognize hallux valgus, claw and hammer toes
39. assess a patient's feet with them standing
40. assess for flat feet (including the patient standing on tip toes)
41. recognize hindfoot/heel pathologies
42. assess plantar and dorsiflexion of the ankle
43. assess movements of inversion and eversion of the foot
44. assess the subtalar joint
45. perform a lateral squeeze across the metatarsophalangeal joints
46. assess flexion/extension of the big toe
47. examine a patient's footwear
48. palpate the spinal processes
49. assess lateral and forward flexion of the lumbar spine (using fingers not tape measure)
50. assess thoracic rotation with the patient sitting

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## Arthritis Research UK Topical Reviews

Reports on the Rheumatic Diseases | Series 6 | Spring 2011 | Topical Reviews No 8

### The foot and ankle in rheumatology

**Philip Hellwell, Heidi Siddle, Anthony Redmond**  
Foot and Ankle Studies in Rheumatology Group, Section of Musculoskeletal Disease, Leeds Institute of Molecular Medicine, University of Leeds

- **Foot problems are common in rheumatology**
- **Foot problems are often missed in rheumatology because of lack of confidence or competence in assessing the foot**
- **A simple but comprehensive clinical assessment of the foot can be performed in around 1 minute**
- **Many rheumatological foot problems can be managed by the patient, with judicious advice on footwear and simple orthoses**
- **In people with systemic diseases, foot problems are complex and often require referral and appropriate multidisciplinary care. Although this model of care is supported by NICE and other bodies, need currently outstrips supply**

An overview of current research and practice in rheumatic disease

**Introduction**  
Despite the high prevalence of foot symptoms in people with rheumatic diseases, the foot and ankle remains a neglected area in rheumatology. Part of the problem is a lack of appropriate training in clinical examination techniques. Also, the foot and ankle are relatively inaccessible to expose the feet may require much effort for someone with arthritis and may not be prioritised by the examining clinician. It is often much easier, therefore, to ignore the potential for foot problems or to simply refer problems unseen to an allied service such as podiatry. While there may be a perception among some clinicians that foot treatments should be delegated to appropriately qualified professionals, all clinicians should be able to assess the feet competently in an outpatient setting. Our aim in this review is to provide an evidence-based guide to the assessment, understanding and treatment of the foot and ankle in the more common rheumatic diseases.

**Anatomy**  
The foot consists of 26 bones (Figure 1) that can be angulated into three interosseous axes: the hindfoot (consisting of the ankle, talus and calcaneus), the mid-foot (talus/navicular/cuneiforms and cuboid) and the

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## Arthritis Research UK Hands On

Reports on the Rheumatic Diseases | Series 6 | Spring 2011 | Hands On No 8

### Neck pain: management in primary care

**Krysia Dziedzic, Carol Doyle, Lucy Huckfield, Treena Larkin, Kay Stevenson, Paoos Sargiovanitis, Nadia Corp, Nadine Foster**  
Arthritis Research UK Primary Care Centre, Keele University

Practical advice for GPs on management of rheumatic disease

**Editorial**  
Neck pain is a common reason for patients to present to primary care to general practitioners or physiotherapists. It is vital that patients are assessed and managed well from the start to identify the small number of people with significant pathology, but more importantly to set patients with non-specific neck pain along the correct treatment path from the start. A confident and knowledgeable approach helps limit disability and reduces the risk of the neck problem becoming chronic.  
This report has been written by physiotherapists based at the Arthritis Research UK Primary Care Centre. They not only present the latest evidence base but also bring to the report their considerable practical experience in managing patients with non-specific neck pain. Of particular interest to GPs is the inclusion of an 'Information and exercise sheet' designed to be printed out and given to patients during consultations. This guide promotes self-help and it is to be hoped that it will reduce the need for patients to be referred to physiotherapy.

**Simon Somerville**

**Introduction**  
Neck pain is a musculoskeletal complaint commonly seen in primary care. It can be disabling to varying degrees and costly in terms of visits to healthcare providers, sick leave and lost productivity.  
Women are affected more than men, with highest prevalence in middle age. Two-thirds of people will experience neck pain at some time in their life with half to three-quarters of these people having a recurrence of their neck pain within 5 years. As neck pain can be recurrent and can vary in disability it is important that healthcare professionals provide simple, clear advice on management at an early stage.  
This report aims to provide the clinician with the latest evidence-based assessment and treatment strategies and provide practical advice on things people can do to help themselves for the management of non-specific neck pain. Pharmacological treatment is not included in this review.

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## Other resources we offer

In addition to this guide, Arthritis Research UK offers a range of other resources for students and healthcare professionals. These include our Reports on Rheumatic Diseases, Hands On and Topical Reviews, DVDs including pGALS (paediatric Gait, Arms, Legs, Spine), the JointZone website [www.jointzone.org.uk](http://www.jointzone.org.uk), and our Collected Reports volumes. Please visit our website [www.arthritisresearchuk.org](http://www.arthritisresearchuk.org) and follow the links.

## Funding opportunities

(for further details of these opportunities, visit our website [www.arthritisresearchuk.org](http://www.arthritisresearchuk.org) or return the form on the previous page to the address shown)

### For medical students:

#### Student electives

This programme provides the opportunity and the funding for medical students to take part in an overseas elective relevant to rheumatology/musculoskeletal medicine.

#### Medical Student Prize

A prize is offered each year in each medical school. In addition to the prize money, winners receive a certificate and silver medal, and three national winners are also given funding to attend the BSR annual conference.

### For nurses and allied health professionals:

#### Training Fellowships

These training fellowships are offered to nurses and allied health professionals committed to the care of patients with musculoskeletal diseases to undertake training or research at a UK institution leading to a PhD or other higher degree.

#### Training Bursaries

These grants provide funding for research, practical experience, and formal education in rheumatology. Funding is offered towards the costs of attending either:

- a short training/diploma course or modules from a taught MSc programme in the UK
- a full MSc course or taught/professional doctorate in the UK

#### Educational Travel Awards

Travel awards are offered to nurses or allied health professionals either:

- towards the costs of attending a national or international meeting in order to present a paper or poster, chair a session or lead a discussion, or
- to enable nurses or allied health professionals to visit wards/units in their specialty for the purpose of studying other methods of care of patients with arthritis and related musculoskeletal diseases.

#### Nursing and AHP Prizes

Each year Arthritis Research UK offers, in association with BHPR and other specialist rheumatology AHP groups, a number of prestigious prizes to nurses and allied health professionals. In addition to the prize money, winners receive a silver medal and certificate.

# Arthritis Research UK is the charity leading the fight against arthritis.

We're working to take the pain away for sufferers of all forms of arthritis and helping people to remain active. We do this by funding high class research, providing information and campaigning.

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Copeman House, St Mary's Court  
St Mary's Gate, Chesterfield  
Derbyshire S41 7TD

**Tel** 0300 790 0400 **Fax** 01246 558007

**Email** [info@arthritisresearchuk.org](mailto:info@arthritisresearchuk.org)

**[www.arthritisresearchuk.org](http://www.arthritisresearchuk.org)**

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