

## Intended learning outcomes

The Intended Learning Outcomes for this session are:

- Discuss the common causes of joint pain and how to gather information in a patient presenting with joint pain
- Demonstrate how to gather a well-rounded impression of a patient presenting with back pain including understanding the patient's perspective
- Discuss shared decision making and recognise the challenges of managing patient expectations
- Describe the features of serious causes of back pain (red flags)
- **Demonstrate the lower limb neurological examination**

## Context for the session

Students will have covered the following in the two-week joint pain block:

In **Case-Based Learning** they will have discussed a 24-year-old, male, self-employed brick layer. He initially presents to his GP with acute lower back pain (non-specific/mechanical back pain). He re-presents four years later, to the Emergency Department, with reduced perianal sensation, urinary hesitancy, and neurological signs (cauda equina diagnosed on MRI).

In **Lectures, workshops and practical** they will have learnt about:

- The synovial joint
- Rational imaging of the painful knee
- Back pain
- Rational imaging of lower back pain
- Fragile bones and crush fractures in older people
- The painful joint
- Joint pain with systemic illness
- Pain pathways and analgesia
- Preserving bone mass in ageing people

## Specifics for joint pain in GP clinical contact

### Introduction

The key learning goal for this session are for students to apply their knowledge by interviewing and examining patients with musculoskeletal symptoms.

As with the previous sessions:

- refer to the [Year 2 GP handbook](#), which covers the information common to all sessions.
- use the suggested session plan below as a guide on how to use your time with your group

Allow time for:

- introductions (reflecting on any learning/action points from the previous session, low mood)
- student-led interaction with patient(s), and
- debriefing the group (usually without the patient present) to ask questions and consolidate learning.

Musculoskeletal disorders account for ~30% GP's consultations and are the most common cause of repeat consultations in primary care. Get/observe/help students to:

- interview and examine patients with relevant problems and summarise what they have found to you
- consider variations in presentation, differential diagnosis and what they might do next
- consider the patient perspective, impact of the illness or problem on patient lives, and to consider what support and future needs patients have.

And give feedback accordingly.

### (Expert) patients

Suitable patients for the block are people with musculoskeletal problem(s) that affect their mobility or activities of daily living, who are willing to speak to and be examined by medical students.

Examples of suitable conditions include osteoarthritis of one or more joints; mechanical back pain; and/or rheumatoid arthritis.

### Tasks

Ask the students to reflect on their learning about low mood and how it might apply to joint pain.

Assess students' learning needs for this session: what have students learnt during their joint pain case-based learning, what do they feel confident in, and what do they want to revisit?

Prepare for the session:

- Brainstorm symptoms and causes of joint pain (use the supplied mind map, if you find this helpful)
- How do you systematically consult with and examine a patient with joint pain?

Demonstrate and practise the lower limb neurological examination (ideally on volunteer patient) – please note that this has been demonstrated in a lecture, but the students have not had much practise at this examination.

## Suggested session plan

AM	PM	Activity	Details
0900	1400	<b>Introduction</b> 30 mins	<ul style="list-style-type: none"> <li>•Take register</li> <li>•Check in with your students</li> <li>•Review the session plan and learning objectives</li> <li>•Brainstorm topic</li> </ul>
0930	1430	<b>Clinical interview</b> 45 mins	Students practise taking a clinical history with a patient and presenting this to the GP/group, considering clinical reasoning
1015	1515	<b>Break</b> 10 minutes	
1025	1525	<b>Examination</b> 45 mins	Students consider/practice relevant clinical examination and summarising findings to the GP/group
1110	1610	<b>Break</b> 10 minutes	
1120	1620	<b>Debrief</b> 30 minutes	<ul style="list-style-type: none"> <li>•Discuss the day's cases &amp; draw out learning points</li> <li>•Tutor Feedback</li> </ul>
1150	1650	<b>Wrap up</b> 10 mins	<ul style="list-style-type: none"> <li>•Summarise learning points and identify new learning needs</li> <li>•Plan for next time</li> </ul>
1200	1700	<b>Close</b>	•Submit register

The above is only a guide, and GP teachers are at liberty to use the time flexibly, according to the patients met and group's needs.



## Information given to students

### History

Possible screening questions for musculoskeletal problems:

- Do you have any pain, swelling 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?

The main symptoms of musculoskeletal conditions are:

- pain
- stiffness, and
- joint swelling

As with all pain, it is important to record the site, character, radiation, and aggravating and relieving factors.

Try to broadly categorise the symptoms and signs (from the history and examination) by answering the following key questions:

- **Are the symptoms from the joint itself or the soft tissues (tendons/muscles)?** It is important to identify when pain may appear to arise from the joint but is in fact referred pain. For example, pain in the left shoulder referred from the diaphragm, the neck, or cardiac ischaemia.
- **Is the condition acute or chronic?** When did the symptoms start and how have they evolved? Was the onset sudden or gradual? Was the onset associated with a particular event – for example, trauma or infection? What treatments, if any, have been tried and did they make any difference?
- **Is the condition inflammatory or non-inflammatory?** Inflammatory joint conditions, such as rheumatoid arthritis, are associated with prolonged early morning stiffness that eases with activity. Non-inflammatory conditions, such as osteoarthritis are associated with pain more than stiffness, and the symptoms are usually exacerbated by activity.
- **What is the pattern of affected areas/joints?** How many joints are affected? Are they small or large joints? And is the pattern symmetrical or asymmetrical?

Common patterns of joint involvement include:

- Monoarticular – only one joint affected (e.g. septic arthritis)
- Pauciarticular (or oligoarticular) – only a few joints affected (e.g. psoriatic arthritis)
- Polyarticular – many joints affected (e.g. rheumatoid arthritis)
- Axial – the spine is predominantly affected (e.g. ankylosing spondylitis)
- **What is the impact of the condition on the patient's life?** Understanding the impact of the disease on the patient is crucial to negotiating a suitable management plan. 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, mood, depression and anxiety, should be approached with simple, direct, open questions.

- **Are other systems involved?** Inflammatory arthritis often involves 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.

The answers to these questions should enable you to produce a succinct summary of the patient's condition and would lead you to a narrower differential diagnosis. 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 their mobility."*

The below table (previously taken from <https://versusarthritis.org/>) provides a summary of typical features of some common musculoskeletal conditions and what to look for:

	Common Inflammatory conditions				Common non-inflammatory conditions	
	Rheumatoid arthritis (RA)	Seronegative arthritides (e.g. reactive and psoriatic arthritis)	Gout	Polymyalgia rheumatica (PMR)	Osteoarthritis (OA)	Fibromyalgia
Onset	Usually acute or subacute	Acute/subacute Or chronic	Usually acute	Usually acute/subacute	Chronic	Chronic
Typical age and gender	Female: male 3:1 Any age	Any age	Female: male 1:3 Very rare in pre-menopausal women	Female: male 2:1	Hand OA more common in females Usually age ≥45	Female: male 7:1 Age 30–50
Pattern of joint involvement	Usually symmetrical hands and feet	Can be monoarthritis or asymmetrical polyarthritis or spine	Monoarthritis most commonly – MTP, ankle, knee	Usually shoulder and pelvic girdle	Normally polyarticular Hands, knees, hip and feet most common	Widespread pain
Other clues	Raynaud's syndrome Dry eyes and mouth Systemic upset	Tendon insertion pain (enthesitis) Psoriasis Inflammatory bowel disease Uveitis	Risk factors: obesity, alcohol, diuretic treatment	Severe stiffness May have overlap lap with temporal arteritis	Heberden's or Bouchard's nodes Crepitus	Poor quality of sleep Tender soft tissue 'trigger points' on examination Multiple symptoms

## Back pain

We understand it may be challenging to find a patient with back pain to come in to meet the students, however we do want them to practise the lower limb neurological examination which is important to be able to do in the context of a patient presenting with back pain, so you may wish to talk through how you assess patients with back pain.

## Types of back pain

- **Specific** (attributable to a cause such as sciatica, vertebral fracture, renal or intra-abdominal pathology, cancer including multiple myeloma and metastases, and rheumatological conditions such as ankylosing spondylitis)
- **Non-specific** (or “mechanical” back pain) not attributable to a known cause but many likely to be “musculoligamentous strain” (NICE)

## Red flags

- Back pain in the younger and the older patient (< 20 or > 50)
- Non-mechanical pain – constant pain or rest pain +/- night pain
- Thoracic pain
- Saddle anaesthesia – numbness/tingling perineal or perianal
- Bladder dysfunction (e.g. urinary retention, incontinence)
- Faecal incontinence
- Limb weakness
- Associated trauma
- Weight loss
- Fever

## Examination

Watch this [Eight minute video on the lower limb neurological examination](#) (accessed 12/02/2025)

Versus Arthritis UK also has [Examination of the spine | Versus Arthritis](#)

## Look

- With the patient standing, inspect the spine (including side on) for evidence of:
  - scoliosis (curve of the spine in the coronal plane)
  - abnormal lordosis (excessive curve in the spine in a sagittal plane, convexity forwards) or
  - kyphosis (excessive flexed curvature of the spine in a sagittal plane)
  - obvious asymmetry
- Assess the patient's gait (see lower neurological examination)

## Feel

- Palpate the vertebrae
- Palpate the sacroiliac joints
- After the neurological examination you

## Move

- Check range of motion and pain
- Ask the patient to bend to touch their toes. This movement is the first movement affected by lumbar spinal problems and is important functionally (for dressing). 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.
- Straight leg raise

## Lower limb peripheral neurological examination

### To begin:

#### WIPE

- Wash hands
- Introduce self, stating your name and role
- Identify patient (check name, DOB and what they would like to be called)
- Permission – gain consent for the exam including a brief outline of what it will entail and how long it will take.
- Position – patient should sit comfortably on a couch (backrest at 30-45 degrees) with legs extended
- Pain – ask if the patient is in any pain
- Privacy – ensure curtains/doors are closed, consider blanket for areas not being examined
- Exposure – legs exposed from hips to feet

### General inspection

What to examine	Assessing for
Conscious level	AVPU – alert, responds to voice, responds to pain or unresponsive Glasgow coma scale 3-15 gives greater range of level of response
General appearance	Is patient alert, orientated, in pain, generally appearing well or unwell?
Gait/Posture	Use of mobility aids. Does gait appear normal? Abnormal posture e.g. leaning to one side. Limb posture e.g. contractures
Body habitus	Cachectic, well-nourished or obese
Face	Facial droop or asymmetry, reduced facial expression, ptosis, pupil asymmetry
Speech	Is speech normal? Does patient understand instructions? Dysarthria, receptive or expressive dysphasia
Musculature	Scars, wasting, involuntary movements, fasciculations, tremors (SWIFT)

### Around the bed:

- Monitoring devices
- Medication
- Oxygen, NG tube, IV infusions, urinary catheter
- Mobility aids



## Lower limb peripheral neurological examination

### Gait & Balance

What to examine	Assessing for	Associated with
Ask the patient to stand from a seated position	Difficulty rising from the chair / needing more than one attempt / using arms to push up	Proximal muscle weakness – may be due to myopathy, or radiculopathy  Slowness to rise in people with Parkinson's  Associated with / marker of frailty
Ask the patient to walk away from you and then turn and walk back towards you <ul style="list-style-type: none"> <li>• Posture</li> <li>• Stride length</li> <li>• Step height</li> <li>• Stability and base</li> <li>• Arm swing</li> <li>• Turning</li> <li>• Speed</li> <li>• Initiation of gait</li> </ul>	Hemiparesis - Leg moves stiffly and swings out to avoid foot dragging on floor	Cerebral stroke or tumour
	Ataxic gait – unsteady, broad based, staggering and unsteady	Cerebellar ataxia – may be multiple sclerosis, alcohol, cerebellar lesion  May have associated nystagmus, dysarthria, and cerebellar signs in the limbs
	Shuffling or “festinant gait”- patient leans forward, takes progressively smaller steps and increases pace, multiple small steps to turn, slow walking	Parkinsonian - Stooped and flexed posture with a loss of arm swing, difficulty getting going and may ‘freeze’.
	Spastic gait – legs stiff, hips and knees flexed and adducted and feet plantar flexed, “scissoring of legs”	Cerebral palsy, Multiple Sclerosis (MS), Motor Neurone Disease (MND) Spinal cord compression or subacute combined degeneration of the spinal cord
	Neuropathic gait - High stepping gait with foot drop	Peripheral nerve compromise e.g. common peroneal nerve palsy, polyneuropathy caused by diabetic neuropathy or inherited neuropathies such as Charcot Marie Tooth

	Waddling gait – pelvis shifts from side to side as the patient walks creating a waddling motion. 'Trendelenburg's sign'	Proximal weakness from myopathies or proximal neuropathies. Trendelenburg's sign can also be positive due to hip pathology
Assess gait on tiptoes and heels	Tests for distal weakness of plantar flexion and dorsiflexion	Weakness of plantarflexion: Myopathy, peripheral neuropathies, motor neurone disease S1/S2 neuropathy
Assess gait on heels	Tests for distal weakness	Weakness of dorsiflexion – foot drop
Co-ordination: Ask patient to walk heel to toe (tandem gait)	Unsteadiness/ stumbling	Impaired proprioception, vestibular dysfunction, cerebellar cause
Romberg's test – Ask patient to stand still with feet together, look ahead, and then close their eyes.	Unsteadiness/ stumbling without correction (Stand next to the patient to support and prevent falling)	Positive test associated with impaired proprioception or vestibular dysfunction called "sensory ataxia"

**Now ask the patient to lie down**

### **Tone**

<b>What to examine</b>	<b>Examination notes</b>	<b>Assessing for:</b>
Roll leg from side to side (hip internal and external rotation)	Ask the patient to relax their leg and allow you to move it/ take the weight	Flaccidity or increased tone <ul style="list-style-type: none"> <li>Hypertonia can be upper motor neuron lesion(s)</li> <li>Hypotonia can be lower motor neuron lesion(s) or cerebellar disease</li> </ul>
Flex and extend knee		
Ankle plantar and dorsi flexion		
Ankle clonus – if reflexes are abnormally brisk	Rotate the ankle at the heel and then briskly dorsiflex the foot. Clonus is present if the foot beats rapidly.	Clonus can be physiological but 5 + beats is abnormal <ul style="list-style-type: none"> <li>upper motor neuron lesion(s) e.g. stroke, multiple sclerosis, cerebellar</li> </ul>

## Power

What to examine:	Grading power & nerve root supply of the lower limb																
<p>Test power of each muscle group against your own</p> <p>Start with the biggest muscle groups (and work distally)</p> <p>Compare right with left as you move down</p> <p>Nb. These are typically tested by nerve root rather than peripheral nerve</p>	<p><b>Power is graded according to the MRC scale:</b></p> <table> <tr><td>5</td><td>Normal power</td></tr> <tr><td>4+</td><td>Submaximal movement against resistance</td></tr> <tr><td>4</td><td>Moderate movement against resistance</td></tr> <tr><td>4-</td><td>Slight movement against resistance</td></tr> <tr><td>3</td><td>Moves against gravity but not resistance</td></tr> <tr><td>2</td><td>Moves with gravity eliminated</td></tr> <tr><td>1</td><td>Flicker of movement</td></tr> <tr><td>0</td><td>No movement</td></tr> </table>	5	Normal power	4+	Submaximal movement against resistance	4	Moderate movement against resistance	4-	Slight movement against resistance	3	Moves against gravity but not resistance	2	Moves with gravity eliminated	1	Flicker of movement	0	No movement
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<b>Hip flexion:</b> Ask patient to straight leg raise their leg off the couch and resist against you pushing down on their thigh	<b>L1/L2</b>																
<b>Hip extension:</b> Place your hand under each thigh and ask patient to push their leg down onto your hand as you try and lift it up	<b>L5/S1/S2</b>																
<b>Knee flexion:</b> Ask patient to bend at the knee (one leg at a time) with their foot flat on the couch and to pull their heel towards their bottom while you try and stop them with your fingers of one hand cupped around the back of their ankle	<b>S1</b>																
<b>Knee extension</b> Ask patient to bend at the knee (one leg at a time) with their foot flat on the couch, stabilise the back of their knee. and ask them to kick out against your hand on their shin.	<b>L3/L4</b>																
<b>Ankle dorsiflexion:</b> Ask patient to bring toes up towards them (dorsiflex) while you resist this movement using the side of your hand	<b>L4/L5</b>																
<b>Ankle plantar flexion:</b> Ask patient to push toes down (plantar flex) against your hand	<b>S1/S2</b>																
<b>Ankle inversion</b> Ask patient to turn foot inwards against resistance	<b>L4/L5</b>																
<b>Ankle eversion</b> Ask patient to turn foot outwards against resistance	<b>L5/S1</b>																
<b>Great toe extension</b> against resistance e.g. two fingers	<b>L5</b>																

## Reflexes

What to examine	Assessing reflexes
Use a tendon hammer in a “swinging arc” If reflexes absent or diminished ask the patient to grit their teeth or clench their hands to reinforce the reflex	May be: <b>Absent</b> <b>Reduced</b> <b>Normal</b> <b>Brisk</b>
<b>Knee jerk</b> – support knees with an arm	Brisk (or increased) reflexes suggest upper motor neurone Reduced or absent reflexes suggest lower motor neurone
<b>Ankle jerk</b> – bend knee to the side on the couch to expose the Achilles tendon, place a hand under the forefoot to dorsiflex the foot	
<b>Plantar reflex</b> –the Babinski response. Firm pressure with a neuro tip starting from the heel then move along the lateral border ending medially at the MTP joint of the great toe	Normal is when the first movement of great toe is flexion (it goes down), if it goes up (an extensor response) with fanning of the toes, this suggests an upper motor neurone lesion

## Co-ordination

What to examine	Examination notes	Extra notes
Heel-shin test	Ask patient to put one heel on opposite knee, run down shin to ankle then lift heel and repeat, twice on each leg	Testing for smooth accurate movements  Testing for a loss of coordination / ataxia but can be abnormal for other reasons e.g. weakness

## Sensation

What to examine	Examination notes	Extra notes
Sensation: Get patient to close their eyes. Use the sternum to demonstrate “normal”	Move down in a dermatomal distribution (L1-S2) compare side to side. Ask if the patient can feel the sensation and if it feels the same on both sides	Repeat this for: Light touch – cotton wool Pain – neuro tip
Vibration: eyes closed Use the sternum to demonstrate “normal”	Tuning fork: start with most distal bony prominence (great toe)	128Hz tuning fork

	and if they can't feel it move to next proximal joint i.e. medial malleolus then tibial tuberosity	
Proprioception: eyes closed	Using your thumb and forefinger stabilise the distal interphalangeal joint of the great toe & demonstrate moving the toe up and down, then ask them to tell you if the toe is up or down as you move it.	Hold the toe on either side to prevent pressure on the nail, which can mask proprioceptive loss

### To finish

- Ensure the patient is dressed and comfortable
- Wash hands

### Further examinations

- Cranial nerve examination
- Upper limb peripheral neurological examination
- Rectal examination to check for anal tone if spinal cord injury suspected

Further resources and references

[Back Pain History Taking | Communication | OSCE | Geeky Medics](#)

[Back Pain - OSCE Case | Geeky Medics](#)

[Examination of the spine | Versus Arthritis](#)

[Back pain | Causes, exercises, treatments | Versus Arthritis](#)

[Back pain - low \(without radiculopathy\) | Health topics A to Z | CKS | NICE](#)

Lower limb neurological examination:

[Eight minute video on the lower limb neurological examination](#)

Video of a full neurological examination

[The Full Neurological Examination](#)

UCL Clinical Skills