

Contents

Series Editors' foreword	v	Examination of an acute hot swollen joint	40
Preface	vi	Investigation of an acute hot swollen joint	41
Acknowledgements	vii	7 A child with a limp	43
Series Editors' acknowledgements	viii	Differential diagnosis	43
1 Taking a history	1	Focused history	43
Presenting complaint	1	Focused examination of a child with a limp	44
History of the presenting complaint	1	Investigating a child with a limp	45
Medical history	2	8 A limb swelling	47
Drug history	2	Differential diagnosis	47
Social history	2	History focusing on a swelling	47
Family history	2	Examination focusing on a swelling	48
Systemic enquiry	2	Investigation of a patient with a swelling	48
2 Examining joints	3	9 Back pain	51
General principles	3	Differential diagnosis	51
Clinical examination	3	History focusing on back and leg pain	51
Examination of the hip	5	Examination focusing on back and leg pain	51
Examination of the knee	7	Investigation of a patient with back pain	52
Examination of the ankle and foot	9	Mechanical low back pain	52
Examination of the spine	10	Prolapsed intervertebral disc	54
Examination of the shoulder	12	Spondylolisthesis	56
Examination of the elbow	13	Spinal stenosis	57
Examination of the wrist and hand	14	Discitis/vertebral osteomyelitis	58
Further reading	15	Scoliosis	59
3 Investigations	17	10 Altered sensation and weakness	61
Blood tests	17	Differential diagnosis	61
Synovial fluid analysis	19	History	61
Nerve conduction studies and electromyography	19	Carpal tunnel syndrome	62
Biopsy	19	Ulnar nerve entrapment	63
Imaging	19	Radial nerve injuries	64
4 Regional pain	23	Common peroneal nerve injuries	64
Back, hip and leg pain	23	Further reading	65
Knee pain	25	11 Osteoarthritis	67
Ankle and foot pain	28	Definition	67
Neck and/or upper arm pain	29	Incidence	67
Complex regional pain syndrome	32	Pathology and aetiology	67
Further reading	32	Clinical features	68
5 Widespread musculoskeletal pain	33	Examination	68
Investigating widespread pain	33	Management	69
Fibromyalgia	34	Further reading	71
Paraneoplastic rheumatic syndrome	37	12 Rheumatoid arthritis	73
Further reading	37	Definition	73
6 An acute hot swollen joint	39	Incidence and prevalence	73
Differential diagnosis	39	Aetiology	73
History focusing on the acute hot swollen joint	39	Immunological abnormalities	73
		Pathology	73

Contents

Clinical features.....	74	Investigations.....	141
Further reading.....	81	Treatment.....	141
13 Spondyloarthropathies.....	83	Open fractures.....	142
Definition.....	83	Spinal injuries.....	142
Aetiology.....	83	Pelvic fractures.....	143
Pathology.....	83	Further reading.....	145
Ankylosing spondylitis.....	83	20 Infection of bones and joints.....	147
Psoriatic arthritis.....	86	Osteomyelitis.....	147
Reactive arthritis.....	88	Septic arthritis.....	150
Enteropathic arthritis.....	89	Tuberculosis.....	151
Further reading.....	90	Further reading.....	152
14 Connective tissue diseases.....	91	21 Malignancy.....	153
Systemic lupus erythematosus.....	91	Benign tumours/disorders.....	153
The antiphospholipid syndrome.....	94	Malignant tumours.....	153
Sjögren syndrome.....	95	Infection.....	153
Polymyositis and dermatomyositis.....	97	Metabolic bone disease.....	153
Systemic sclerosis.....	98	History.....	153
The vasculitides.....	101	Examination.....	154
Further reading.....	105	Investigation.....	154
15 Metabolic bone disease.....	107	Primary bone tumours.....	156
Osteoporosis.....	107	Secondary bone tumours.....	159
Paget disease.....	109	Haemopoietic diseases.....	161
Rickets and osteomalacia.....	111	Leukaemia.....	162
Further reading.....	112	Further reading.....	162
16 Gout and pseudogout.....	113	22 Sports injuries.....	163
Gout.....	113	Knee injuries.....	163
Calcium pyrophosphate dihydrate disease.....	115	Clinical features.....	163
Further reading.....	117	Shoulder dislocation.....	167
17 Paediatric joint disease.....	119	Ankle sprain.....	168
Normal variants.....	119	Further reading.....	169
Paediatric hip disorders.....	119	23 Soft tissue disorders.....	171
Congenital talipes equinovarus (clubfoot).....	122	Introduction.....	171
Osteogenesis imperfecta.....	123	Tendon lesions.....	171
Cerebral palsy.....	124	Bursitis.....	172
Nonaccidental injury.....	125	Dupuytren contracture.....	173
Paediatric knee conditions.....	125	Further reading.....	174
Juvenile idiopathic arthritis.....	126	24 Principles of orthopaedic surgery.....	175
Further reading.....	128	Preoperative assessment.....	175
18 Fractures.....	129	Immediate preoperative care.....	175
Incidence.....	129	Surgery.....	175
Definitions.....	129	Postoperative care.....	178
Clinical features.....	129	Complications.....	179
Diagnosis and investigation.....	130	Infection.....	180
Management.....	131	Shock.....	180
Complications of fractures.....	133	Further reading.....	182
Common fractures.....	134	Self-Assessment.....	183
Further reading.....	137	Single best answer (SBA) questions.....	185
19 Trauma.....	139	Extended-matching questions (EMQs).....	197
Definition.....	139	SBA answers.....	205
Incidence.....	139	EMQ answers.....	213
Clinical features.....	139	Index.....	219

Taking a history

1

Taking a good history is vital in making a correct diagnosis. A clear history can often give many clues to diagnosis long before you have examined the patient or ordered any tests. It is important to establish a rapport and make the patient feel at ease: patients will find it easier to share information if they feel comfortable.

HINTS AND TIPS



Politely introduce yourself to the patient using your name and grade. Remember to ask for the patient's consent, particularly if you plan to take notes.

The first points to document in your history are:

- The patient's full name, date of birth, sex and hospital number.
- The time, date and place of the consultation (e.g., Accident and Emergency Department).
- The source of the referral, e.g., GP referral.

PRESENTING COMPLAINT

This is a short statement summarizing the patient's presenting symptoms, for example:

- Painful right knee.
- Stiffness and swelling in both hands.

HISTORY OF THE PRESENTING COMPLAINT

This should contain details of the patient's presenting symptoms from their onset to the current time. The following areas are important to discuss when taking a history:

COMMUNICATION



Begin your history taking with open questions, e.g., 'Tell me about your pain', then ask closed questions if necessary, e.g., 'Does your knee swell up?'

Symptom onset

- Date and time of symptom onset.
- Speed of onset: was it acute or insidious?
- Presence of precipitating and relieving factors such as trauma, other illnesses, medication use, etc.

Pain, swelling and stiffness

It is important to establish the following points:

- Site and radiation.
- Character, e.g., whether it is sharp or dull.
- Periodicity: is it continuous or intermittent?
- Exacerbating and relieving factors.
- Timing: is it worse at any particular time of day?

As a rule, pain and stiffness due to inflammatory conditions such as rheumatoid arthritis are worse first thing in the morning and improve as the day progresses. The duration of early morning stiffness (minutes-to-hours) is a good guide to the severity of the inflammation. By contrast, pain due to mechanical or degenerative problems tends to be worse later in the day, is associated with less severe stiffness and is worse with activity.

Warmth/erythema

Inflamed joints may appear red and feel warm to touch.

Deformity

Some patients consult their doctor because they have developed deformity and are concerned. These often occur in patterns associated with specific conditions. This may or may not be associated with pain.

Weakness

It is important to ascertain whether any weakness is localized or generalized. Localized weakness suggests a focal problem, such as a peripheral nerve lesion, whereas generalized weakness is more likely to have a systemic cause.

Fatigue

Many inflammatory conditions are associated with varying degrees of patient fatigue; this may even be the reason for the patient consulting a doctor in the first place.

Numbness

The distribution of numbness or paraesthesia should be documented, as well as any precipitating factors. For example, if the numbness affects the radial 3,5 fingers and is worse at night, it is probably due to carpal tunnel syndrome. If it affects all the digits, is associated with skin colour changes and is provoked by cold weather, Raynaud phenomenon is more likely.

Functional loss and disability

Loss of function refers to a person's inability to perform an action, such as gripping an object or walking. This is often why a person goes to see their doctor. Disability is a measure of the impact that loss of function has on a patient's ability to lead a full and active life.

HINTS AND TIPS



Always record a patient's functional level in the notes. It is a good marker of progress. Patient assessment questionnaires such as the Health Assessment Questionnaire Disability Index (HAQ-DI) are often used in patients with rheumatoid arthritis. Any restrictions that a patient's disease has on activities of daily living should be documented.

MEDICAL HISTORY

Ask about all current and past medical and surgical disorders, including musculoskeletal problems. In certain

situations it is worth asking about specific illnesses. For example, a patient with carpal tunnel syndrome may have underlying diabetes or hypothyroidism.

DRUG HISTORY

A patient's drug history is always important and sometimes has great relevance to orthopaedic and rheumatological problems. Acute gout can be precipitated by diuretic use and long-term corticosteroids can cause osteoporosis.

SOCIAL HISTORY

Record relevant information about the patient's occupation, their domestic situation, degree of independence, smoking history and alcohol intake. Ask about drugs and sexual history if appropriate. Record the patient's dominant hand.

FAMILY HISTORY

Ask about any family history of musculoskeletal disorders.

SYSTEMIC ENQUIRY

This should be brief but include other symptoms affecting other parts of the body. This is particularly relevant if you think the patient has a connective tissue disease.

● Chapter Summary

- An accurate history is vital to arriving at a correct and sensible differential diagnosis.
- Use open and closed questions to investigate a presenting complaint.
- Remember to ask about pain, swelling and stiffness: these often help to differentiate between mechanical and inflammatory causes.
- Functional questionnaires (such as HAQ-DI) help to quantify the functional impact of a patient's complaint on their activities of daily living.

Examining joints

2

GENERAL PRINCIPLES

It is important to establish a rapport with patients. Dress smartly, be polite and carry identification.

Introduce yourself and start by asking if any areas are painful before you touch the patient. Note any aids such as a wheelchair, Zimmer frame or walking stick.

- Start with adequate exposure of the joint.
- Stand and walk the patient. Watch how they walk. Pathological gait patterns are shown in Table 2.1.
- Position the patient for the joint(s) to be examined. Ensure the patient is comfortable.

Remember that some musculoskeletal conditions are part of multisystem diseases. In the case of polyarthritis and those with inflammatory arthritis, it may be necessary to examine the cardiovascular system, respiratory system and the abdomen. For those with widespread aches and pain, examination of the nervous system may be required.

Table 2.1 Pathological patterns of gait

Gait	Features	Cause
Trendelenburg	Waddling gait	Loss of hip abductor function
Antalgic (painful)	The patient tries to offload the painful limb by quickening and shortening the weight-bearing stance phase of the gait cycle	Any painful condition
Short-leg gait	Dipping of shoulder on affected side	Any condition causing significant leg length discrepancy
High stepping	Knee is flexed and foot is lifted high to avoid foot dragging on the floor	Nerve palsy (peroneal or sciatic)
Stiff knee	Knee cleared of floor by swinging out away from the body	Fusion of knee

HINTS AND TIPS



As a general principle, always examine the joints above and below the affected joint.

CLINICAL EXAMINATION

Examination of a patient should be performed systematically and in a structured way. Use the following method:

- Look: check for swelling, muscle wasting, scars, erythema and deformity.
- Feel: palpate the joint, noting any effusions, tenderness and heat. Note any other prominent features.
- Move: demonstrate joint movement actively and passively.
- Examine areas above and below the joints.

Practice this routine on your friends; note how normal joints look, feel and move.

HINTS AND TIPS



Remember to check active and passive movement. In active movement, the patient moves the joint; in passive movement, the examiner moves the joint.

Peripheral nervous examination

Abnormalities of the structures of the back such as intervertebral disc prolapse can cause abnormalities of the peripheral nerves due to compression of the nerve roots. The most commonly affected are the L5 and S1 nerve roots. In the upper limbs, the most common peripheral neuropathies typically involve compression of the median nerve as it travels through the wrist (carpal tunnel syndrome).

Lower limb

Tone

Lower limb tone is usually normal but is reduced in spinal cord compression (flaccid paralysis).

Examining joints

Power

Power is assessed by Medical Research Council grades:

- 0: Nothing
- 1: Flicker
- 2: Power to move limb with gravity eliminated
- 3: Power to move limb against gravity
- 4: Reduced from normal
- 5: Normal

Test muscle functions are shown in Table 2.2.

Reflexes

Always compare the reflexes between the two limbs and make sure the patient is relaxed. Reflexes can be present, reduced, brisk or absent.

Three reflexes are commonly tested:

- Knee L3-L4: flex both knees over the couch or your arm and tap lightly on the patellar tendon.
- Ankle L5-S1: dorsiflex the ankle with the knees flexed and the leg externally rotated. Tap the Achilles tendon.
- Plantar: this is performed by stroking the handle of the tendon hammer up the plantar skin from the heel towards the big toe. If the toe extends, this is abnormal and is 'upgoing', indicating an upper motor neurone lesion.

Sensation

Ask the patient whether the sensation is normal for them and the same as the other side. Dermatomes are shown in Fig. 2.1.

Anal tone and perianal sensation

In cauda equina syndrome, anal tone is lost and perianal sensation reduced; therefore a per rectal examination is an important part of any spinal examination.

Upper limb

Tone

This is usually normal unless there is a lesion in the cervical spine or injury to the brachial plexus.

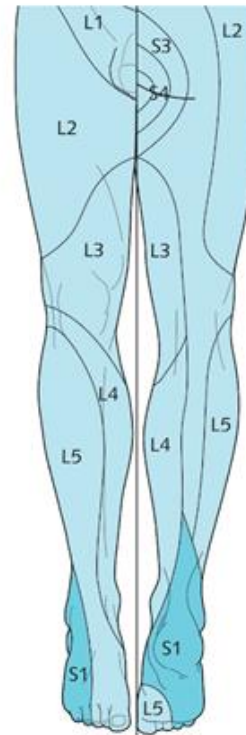


Fig. 2.1 Dermatomes of the lower limb. L, Lumbar; S, sacral.

Power

Upper limb function can be tested as shown in Table 2.3. The innervation of the upper limb muscles is more complex than in the lower limb.

Reflexes

Three reflexes are commonly tested:

- Biceps C5-C6: place your finger over the biceps brachii tendon as it passes through the cubital fossa at the elbow. Tap your finger with the tendon hammer.

Table 2.2 Testing lower-limb muscle function (myotomes)

Muscle action	Nerve roots tested
Hip flexion (iliopsoas)	L1, L2
Knee flexion (quadriceps)	L3
Ankle dorsiflexion (tibialis anterior)	L4
Great toe extension (extensor hallucis longus)	L5
Ankle plantar flexion (soleus/ gastrocnemius)	S1

Table 2.3 Testing upper-limb function (myotomes)

Muscle action	Nerve root tested
Shoulder Abduction	C5
Shoulder Adduction	C6, C7
Elbow Flexion	C5, C6
Elbow Extension	C7, C8
Wrist Flexion/Extension	C6, C7
Metacarpophalangeal/interphalangeal flexion/extension	C7, C8
Metacarpophalangeal abduction/adduction	T1