

## Chapter 8

### Non-specific lower limb

Patients presenting with symptoms in their upper or lower limbs may be placed into two broad categories; those with chronic symptoms and those with acute or recent onset of symptoms. When the type of onset has been determined then you will need to ascertain if the symptoms are of pain, loss of function (i.e. weakness), relating to a deformity or a combination.

Differential diagnosis of musculoskeletal problems relies heavily on getting a clear description of the aggravating and relieving factors and on a competent physical examination. The latter needs lots of practice, as many of the evaluative techniques involve meticulous palpation and the movement of limbs and joints whilst feeling for tissue changes. When dealing with the musculoskeletal system, frequently a physical examination comprises detailed investigation of synovial joints and their associated musculoligamentous structures. Furthermore in evaluating a patient with a locomotor problem, it will be your task to ascertain whether the patient's problem stems from a local structure or whether it originates from a neurological dysfunction. Therefore in working up your differential diagnosis you will inevitably be screening and testing other systems as you progress through case history, until you have completed the physical examination.

If pain is one of the complaints, then ascertain its severity and constancy. Most somatic pains can be tolerated and the patient will derive significant relief from analgesics. Unlike serious visceral pain, neurological pain and those relating to neoplasia will be less influenced by analgesia, changes in position and when severe can make the patient break into sweat and even pass out.

If the patient complains of pains affecting his lower limb, ascertain whether this is localised over particular structures and tissues or whether they have a broader distribution. Uncomplicated musculoskeletal pain which has a so-called mechanical or structural basis may be related to particular tissues such as joints, ligaments, tendons, muscles, bones and other connecting tissues. In this case proceed to evaluate whether the pain is produced by an inflamed or non-inflamed structure. An inflamed structure usually is warmer on touch; there may be skin redness and evidence of swelling. If inflammation is identified, is this confined to a particular structure like a synovial joint or a bursa or whether several such structures are affected?

Therefore ascertain if the inflammation is a local event e.g. from a torn cartilage, or whether a from systemic inflammatory condition affecting several structures.

If pain is not confined to a particular structure then ascertain if the distribution has a recognisable pattern such as a specific dermatome (nerve root) or a wider distribution like a peripheral nerve. Your case history and subsequent physical examination will only yield useful information if your knowledge of the regional anatomy is fresh in your mind. When dealing with symptoms of musculoskeletal origin you need to understand the basic architecture of joints, in particular the synovial ones, the muscle, ligaments and tendons controlling these joints, and the neurological supply to the lower and upper limbs.

In terms of neurological knowledge of high importance, there are the dermatomes of the upper and lower limbs and the clinically important peripheral nerves. Remember the dermatomes of the upper limbs start with C4 from the shoulder and progress down to T2 at the axilla. For the lower limbs the dermatomes start with L1 anteriorly at the inguinal region and progress down to S3 posteriorly and medial to the buttocks.

Know also the distribution of the principle peripheral nerves including the axillary, musculocutaneous, median, radial, ulnar, femoral, obturator, common peroneal and tibial nerves. Several other peripheral nerves have not been mentioned here but you re advised to revisit your Clinical Examination handbook.

In many instances when a patient presents with pain in the lower limbs you will have to ascertain if their symptoms originate within the structures and tissues of the legs or if they are referred from the lumbosacral parts of the spine. Never forget that some patients may have both a local problem as well as suffering from a referred manifestation. In particular the lower lumbar and upper sacral nerve roots are prone to compression from protruding or herniated intervertebral discs.

The elderly are more likely to suffer from advanced spondylotic changes, resulting in loss of disc height at multiple levels causing local pain as well as referred symptoms. Severely osteoporotic patients, especially women, are more likely to suffer from recurring vertebral crush fractures. Obese elderly patients and those predisposed by trauma may suffer from spondylolisthesis. Spinal stenosis or narrowing of the spinal canal due to osteophytosis and from the earlier mentioned degenerative changes often lead to neurological claudication. All of these conditions, to a varying degree, will cause low back pain as well as refer the pain in the lower extremities, manifesting as numbness, pins & needles, muscle cramps, weakness and discoordination. If untreated they will inevitably cause damage to the joints of the lower limbs and muscle dysfunction.

The following tables list some of the most commonly occurring musculoskeletal conditions of the lower limbs:

**Conditions of the hips:**

- Congenital dislocation of the hip
- Perthes disease (congenital)
- Slipped capital femoral epiphysis
- Osteoarthritis
- Fractures
- Avascular necrosis
- Tuberculous arthritis
- Rheumatoid arthritis
- Trochanteric bursitis
- Snapping hip
- Femoral angle deviations (Coxa valga, coxa vara)

**Conditions of the knees:**

- Meniscal tears
- Cruciate ligament tears
- Collateral ligament tears
- Osteoarthritis
- Rheumatoid arthritis
- Haemophilic arthritis
- Intra-articular loose bodies
- Dislocating patella
- Knee deformities (Genu valgum, genu varum)
- Tibial tubercle apophysitis (Osgood-Schlatter's disease)
- Pre-patella bursitis
- Popliteal cysts and popliteal aneurism

**Conditions relating to femur and tibia**

- Hamstring sprain & tears
- Adductor sprain & tears
- Shin splints
- Compartment syndrome
- Intermittent claudication (vascular)
- Neurogenic claudication
- Spinal referral problems

**Conditions of the ankle and foot**

- Inversion and eversion sprains and ligament tears
- Fracture of the fibula and tibia esp. distal end near the malleoli
- Calcaneal tendon rupture
- Osteoarthritis
- Rheumatoid arthritis
- Gouty arthritis
- Congenital: club foot, pes cavus, pes planus
- Painful heel
- Metatarsalgia
- Morton's neuroma
- Toe deformities: hallux valgus, hammer toes, under-riding toe.
- In-growing toenail
- Complications from: Diabetic, Peripheral and Charcot's arthropathies

## Leg pain - differential diagnosis scenarios

Attempt to identify the pathologies described for patients W & X

### Condition W

- Knee pain.
- Marked, immediate swelling (within 3 hours if injured)
- Stiffness and swelling of the knee.
- Tenderness in the joint line.
- Effusion (Collection of fluid).
- Recurring catching or locking.
- Knee buckling.
- Large 'clonk' may be audible
- Limited range of movement

Answer: Meniscal tear

### Condition X

- Knee pain
- Marked, immediate swelling (within 3 hours of the injury)
- Difficulty walking after the injury
- Painful to move the knee
- Occasionally, a feeling of instability, or the knee giving way

Answer: Cruciate tear

# PAIN form

## EXERCISE

You are presented with a patient complaining of non-specific or generalised lower limb pain. Complete the following sections beginning with the most important information. You may use additional paper if you wish to fully complete these sections.

Question sheet

### NON SPECIFIC/GENERALISED LOWER LIMB PAIN

#### IDENTIFY SPECIFIC CASE HISTORY QUESTIONS

- |         |         |
|---------|---------|
| A ..... | F ..... |
| B ..... | G ..... |
| C ..... | H ..... |
| D ..... | I ..... |
| E ..... | J ..... |

#### DESCRIBE YOUR PHYSICAL EXAMINATION PROCEDURE

- |         |         |
|---------|---------|
| A ..... | F ..... |
| B ..... | G ..... |
| C ..... | H ..... |
| D ..... | I ..... |
| E ..... | J ..... |

#### IDENTIFY POSSIBLE PATHOLOGIES FOR THIS PRESENTATION

- |         |         |
|---------|---------|
| A ..... | F ..... |
| B ..... | G ..... |
| C ..... | H ..... |
| D ..... | I ..... |
| E ..... | J ..... |

#### WHAT FURTHER DIAGNOSTIC PROCEDURES COULD BE CONSIDERED?

- |         |         |
|---------|---------|
| A ..... | F ..... |
| B ..... | G ..... |
| C ..... | H ..... |
| D ..... | I ..... |
| E ..... | J ..... |

# PAIN form

## EXERCISE

You are presented with a patient complaining of non-specific or generalised lower limb pain. Complete the following sections beginning with the most important information. You may use additional paper if you wish to fully complete these sections.

Answer sheet

### NON SPECIFIC/GENERALISED LOWER LIMB PAIN

#### IDENTIFY SPECIFIC CASE HISTORY QUESTIONS

- |   |  |
|---|--|
| <b>A</b> Which activities/movement aggravate pain? .....                          | <b>F</b> Is the pain localised in joints, the muscles, bone, ligaments, tendons, near big vessels or non-specific? ..... |
| <b>B</b> Is it confined to just pain or do they also have loss of function? ..... | <b>G</b> Have they had any injuries? .....   |
| <b>C</b> Is there family history or rheumatic or connective tissue disease? ..... | <b>H</b> Is the pain altered by spinal movements or changes in posture? .....  |
| <b>D</b> Do they have O/A? .....  | <b>I</b> Does the patient have any vascular problems? .....  |
| <b>E</b> Is it unilateral or bilateral? .....                                     | <b>J</b> Are there similar symptoms in other parts of the body? .....  |

#### DESCRIBE YOUR PHYSICAL EXAMINATION PROCEDURE

- |  |                                   |
|--|-----------------------------------|
| <b>A</b> General observation and close inspection .....                | <b>F</b> Functional tests .....   |
| <b>B</b> Palpation .....   | <b>G</b> Neurological tests ..... |
| <b>C</b> Active movement .....   | <b>H</b> Vascular tests .....     |
| <b>D</b> Passive movement .....  | <b>I</b> Orthopaedic tests .....  |
| <b>E</b> Active-resisted movement and assessment of muscle power ..... | <b>J</b> .....                    |

#### IDENTIFY POSSIBLE PATHOLOGIES FOR THIS PRESENTATION

- |   |  |
|---|--|
| <b>A</b> Osteoarthritis of the hips, knees, ankles and feet ..... | <b>F</b> Secondary deposits .....      |
| <b>B</b> Vascular conditions .....                                | <b>G</b> Multiple sclerosis .....      |
| <b>C</b> Spinal referral .....                                    | <b>H</b> Inflammatory myopathies ..... |
| <b>D</b> Infections .....   | <b>I</b> Osteoporosis .....            |
| <b>E</b> Fractures .....  | <b>J</b> Peripheral neuropathy .....   |

#### WHAT FURTHER DIAGNOSTIC PROCEDURES COULD BE CONSIDERED?

- |  |                |
|--|----------------|
| <b>A</b> X-rays of specific joints .....         | <b>F</b> ..... |
| <b>B</b> X-rays of lumbar spine and pelvis ..... | <b>G</b> ..... |
| <b>C</b> MRI of specific joints .....            | <b>H</b> ..... |
| <b>D</b> MRI of lumbar spine and pelvis .....    | <b>I</b> ..... |
| <b>E</b> Blood tests .....                       | <b>J</b> ..... |

## Case history – foot pain

Mrs Rossano, a 46 year old woman presents with a 3 week history of pain in her right foot. On questioning she thought the pain started after a 2 week holiday in Cornwall. The weather was unusually warm and sunny and she had taken to walking in leather sandals and when by the beach with bare feet. During the first 10 days of her holiday she did quite a bit of walking and a bit of running with her two children, but there was no symptoms at the time. During the evenings she did some dancing in her new high heel shoes which she recently bought. During the latter part of her holiday, she started feeling sore under the soles of her feet and her 1<sup>st</sup> and 2<sup>nd</sup> toes became particularly sensitive to pressure. She now describes her symptoms “as if though there is a small stone in my shoe” and finds weight-bearing on the right foot uncomfortable. She also noticed that her ankles are swollen, the right more than the left. She can no longer tolerate her high heeled pointed shoes and she has resorted to trainers with an extra layer of gel-like insole given to her by her local pharmacist.

PMH: Hypothyroidism and managed with thyroid tablets, diabetic type-II, perimenopausal, weight 85kg, height 5' 5".

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### Questions:

1. Provide an analysis of the predisposing factors – recent and long-term - that may have contributed to her condition.
2. What do you think Mrs Rossano has done to her feet during her recent holiday? Identify the structures involved and how these may have been damaged.
3. What physical examination procedures may help you in narrowing down your differential diagnosis?
4. If you are able to provide a working diagnosis, in addition to your treatment approach what other advice would you offer the patient.
5. If the patient fails to respond to treatment and management after a reasonable period what further steps should you consider taking?

## References, Bibliography and Recommended reading

**Jamison J R** (2007), Differential Diagnosis for primary Practice, 2<sup>nd</sup> edn., Churchill Livingstone. (ISBN-13: 978-0443102875)

**Goodman C G, Snyder T K** (2007), Differential Diagnosis for Physical Therapists: Screening for Referral, 4th edn, Saunders. (ISBN: 978-0721606194)

**Seller R H**, Differential Diagnosis of Common Complaints, Saunders, 3rd edn, 1996 ISBN: 978-1416029069

**Beck R, et al** (2003), Tutorials in Differential Diagnosis, 4<sup>th</sup> edn., Churchill Livingstone. ISBN: 978-04430615-7-8

### DVD-VIDEO recordings

**Syrimis A** (2007), Clinical Examinations DVDs, Bloomsbury Educational Ltd,

#### ISBNs:

- Respiratory system examination: 978-0-9551291-0-0
- General system examination: 978-0-9551291-1-7
- Cardiovascular system examination: 978-0-9551291-2-4
- Abdominal system examination: 978-0-9551291-3-1
- Peripheral nervous system examination: 978-0-9551291-4-8
- Cranial nerves examination: 978-0-9551291-5-5
- Musculoskeletal examination: 978-0-9551291-6-2
- Case History Taking: 978-0-9551291-7-9
- Clinical Examinations: Complete DVD series: 978-0-9551291-9-3

<http://www.clinicalexams.co.uk/student-resources-section.htm>

(For additional lecture notes, Q&As and images, Username & Password provided in class)

**Boon N A, Colledge N R, Walker, B & Hunter J A A** (2006), Davidson's Principles and Practice of Medicine, 20<sup>th</sup> Edition, Churchill Livingstone ISBN: 978-0-4430703-5-8

**Bickley, L. S.; Szilagyi, P. G.**; 2003; ***Bates' Guide to Physical Examination and History Taking***; (8<sup>th</sup> Ed); Lippincott; New York.

**Epstein, O.**; et al.; 1997; *Clinical Examination*; (2<sup>nd</sup> Ed.); Mosby; London. (similar to Bates but presents the information in a different but equally good way. Some very good photographs and is user friendly).

**Marsh J**; 1999 *History and Examination*; Mosby London. (a great 'crash course' book with sample questions. Very user friendly. I recommend it).

**Forbes, C. D.; Jackson, W. F.**; 1998; *Color Atlas and Test of Clinical Medicine*; (2<sup>nd</sup> Ed.); Mosby; London. Excellent reference book for photographs of various pathologies.

**Haslett, C.**; et al.; 1999; *Davidson's Principles and Practice of Medicine*; (18<sup>th</sup> Ed.); Churchill Livingstone; Edinburgh. (Use to put your clinical findings into context of general medicine).

**Bradley J, Rubenstein D, Wayne D**, The Clinical Manual, Blackwell Scientific publications. ISBN 0-632-03312-6. This is another very good pocket size book but you may have to order it. I find this book very useful because it also had a summary of the main pathologies and their signs and symptoms.