

Gajendra Singh, Musculoskeletal Physician, Wanganui

Dr Charlie Ng, Musculoskeletal Physician, Auckland

Dr Rick Bernau, Musculoskeletal Medicine, Tauranga

Dr Ian Wallbridge, Musculoskeletal Physician, Rotorua

Musculoskeletal Medicine 3 - Lumbar and Sacral Spine - Pre-Conference Workshop

Thursday, 20 June 2013

Start 2:00pm

Duration: 120mins

Works



Rotorua GP CME 2013
New Zealand Medical Association

General Practice Conference & Medical Exhibition

20-23 June 2013 | Energy Events Centre | Rotorua

Acute Low Back Pain Workshop



Charlie Ng MBChB FAFMM
Musculoskeletal Physician

GPCME
20 June 2013

An algorithm for acute LBP

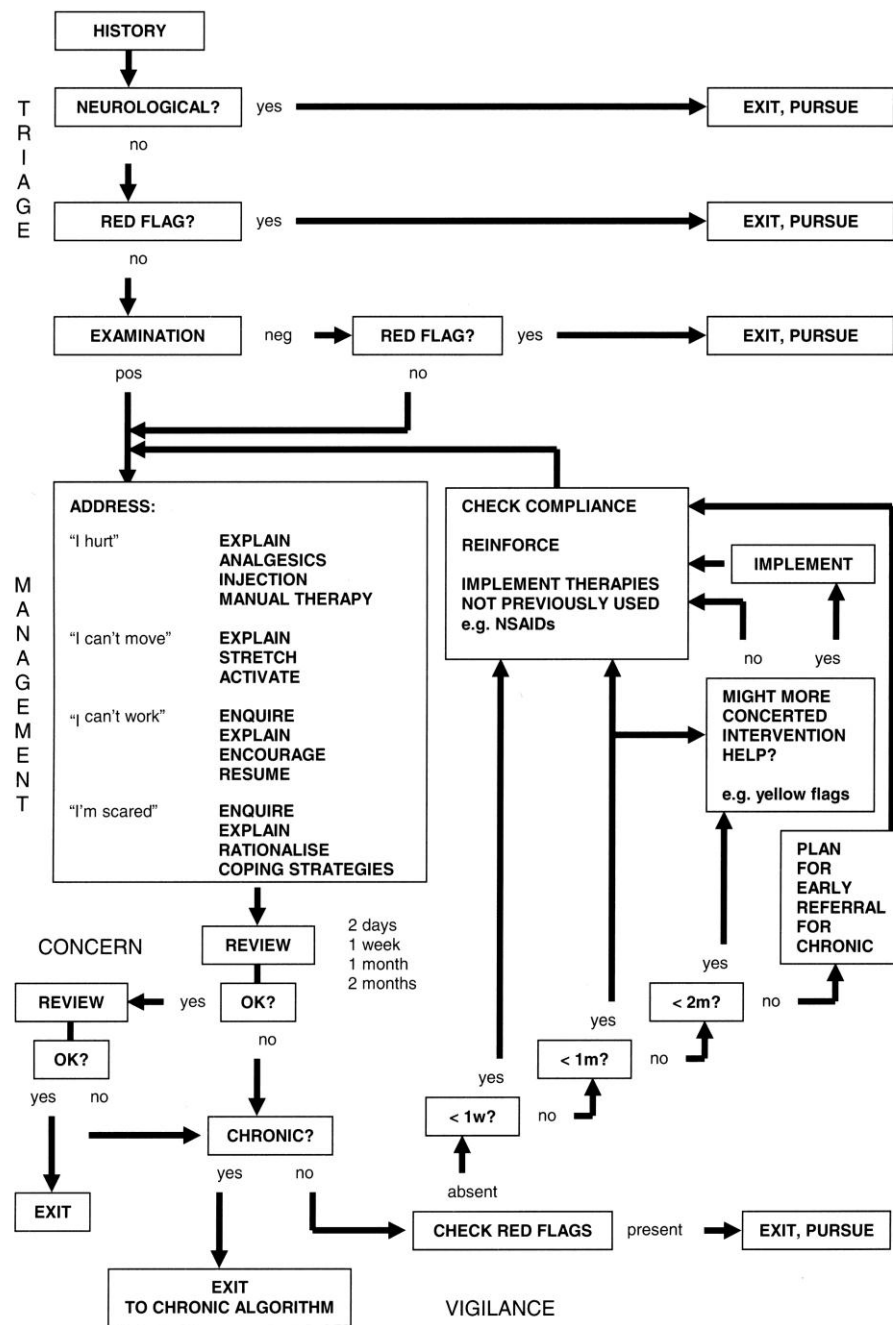


Fig. 1. An algorithm for the management of acute low back pain.

Assessment

Differentiate:

1. Serious pathology (red flag conditions)
2. Radicular nerve involvement
3. Non-specific back pain

An algorithm for acute LBP

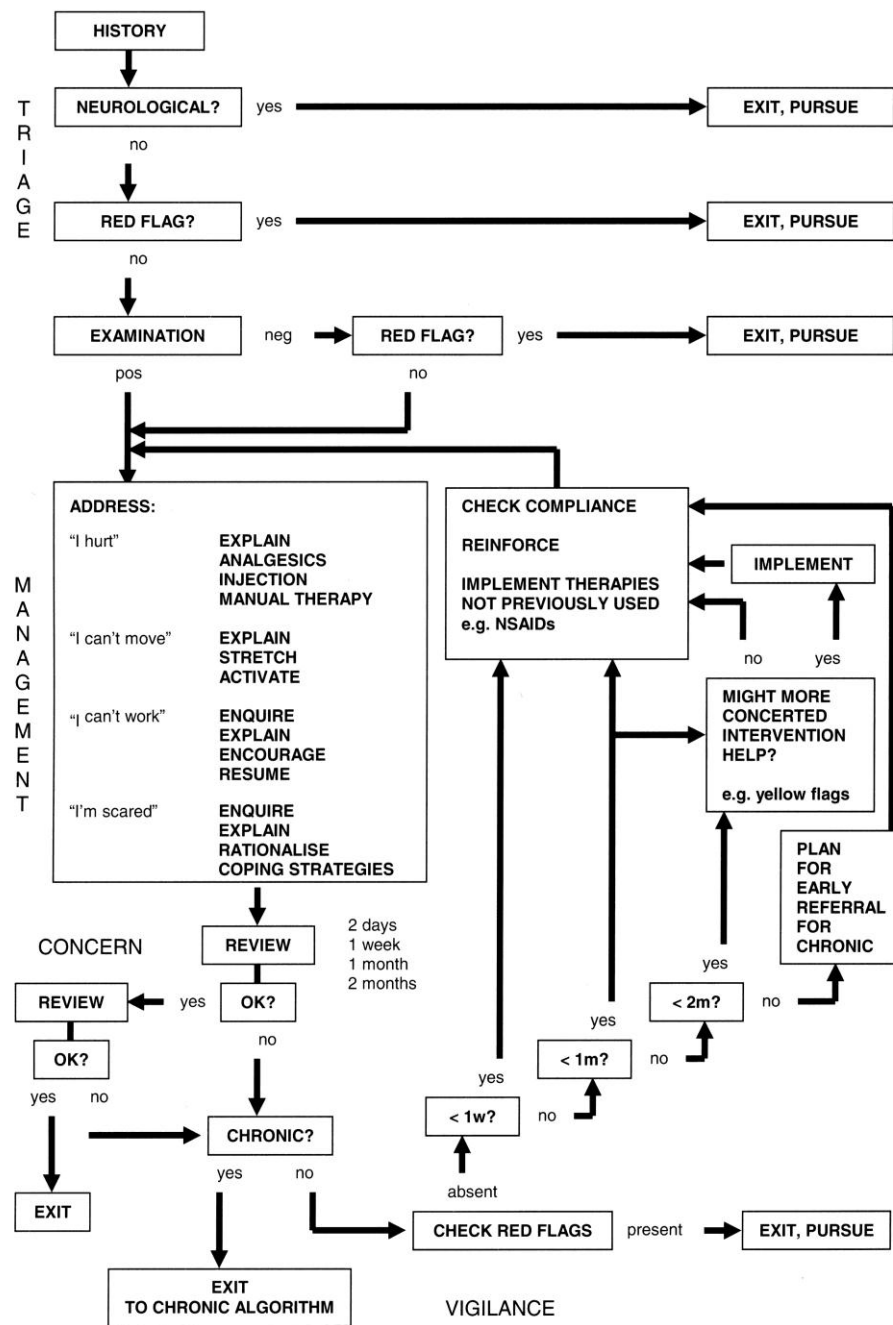


Fig. 1. An algorithm for the management of acute low back pain.

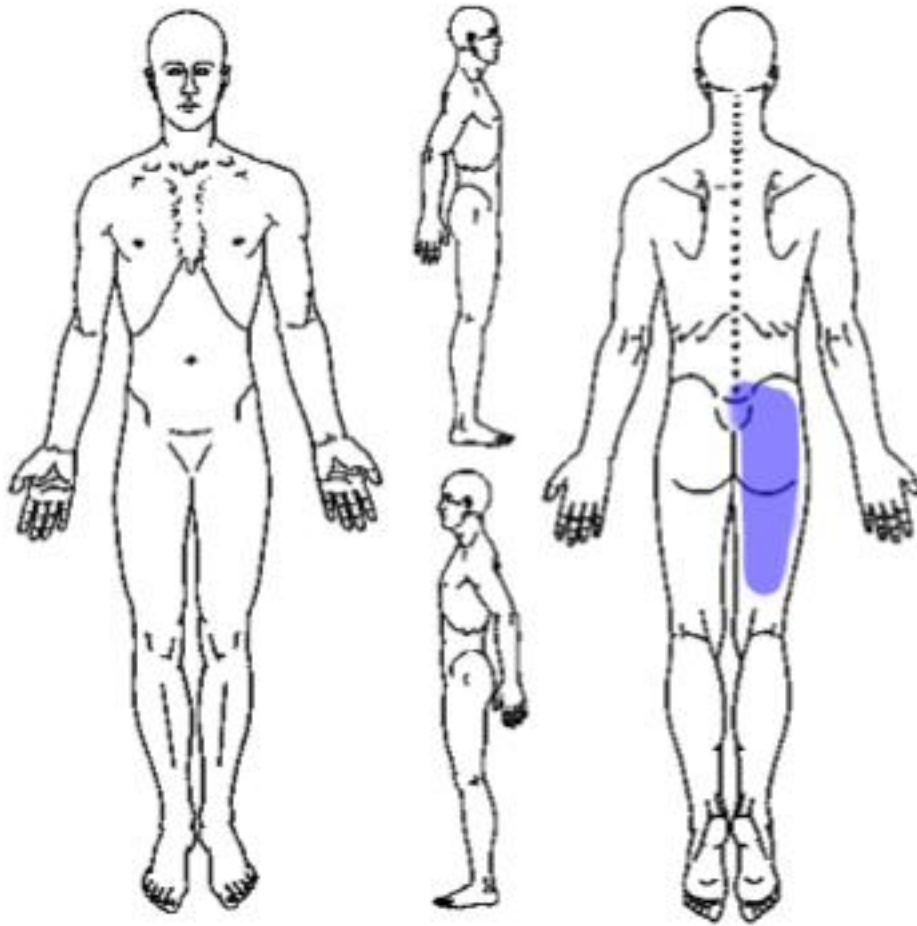
Case study

- 35 yo woman; 4 months pregnant
3 weeks ago, fell while walking dog, landing onto right knee → “I’ve got a sore back”

- Define location of pain
point to the area
use pain map

?lumbar ?thoracic ?sacral ?gluteal ?leg pain ?leg > LBP

Is it truly low back pain?

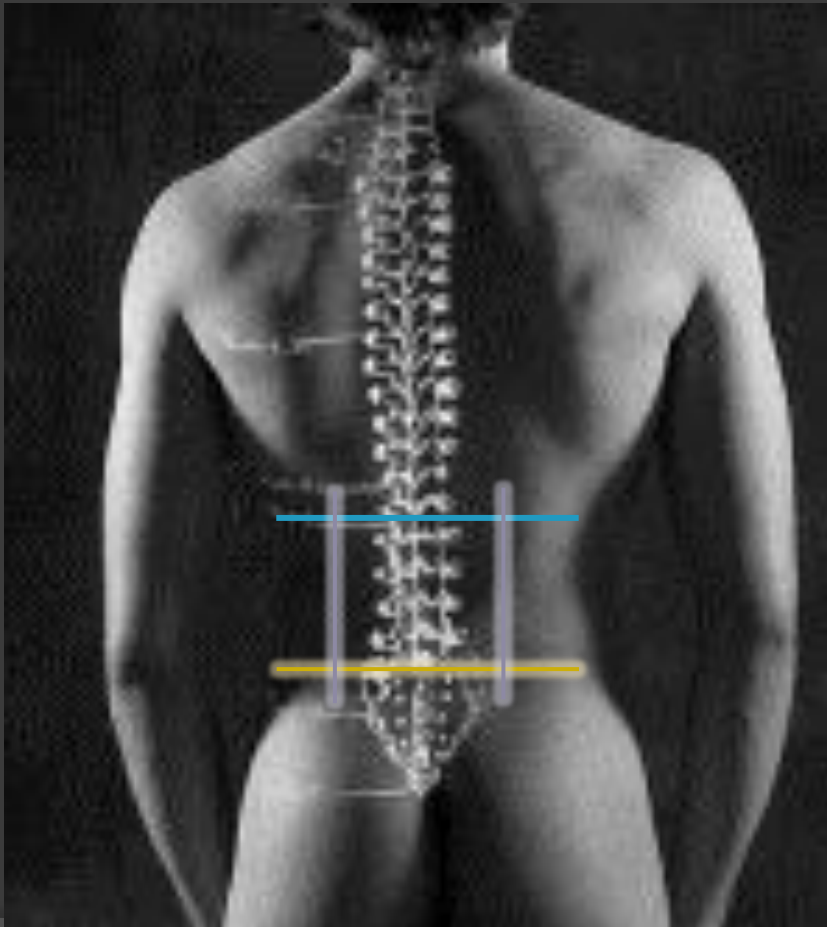


Using a pain map

**Use map from
actual patient
Shaded areas for
pain, Xs for P&N,
numbness**

Low back pain terminology

- ◎ Lumbar spinal pain



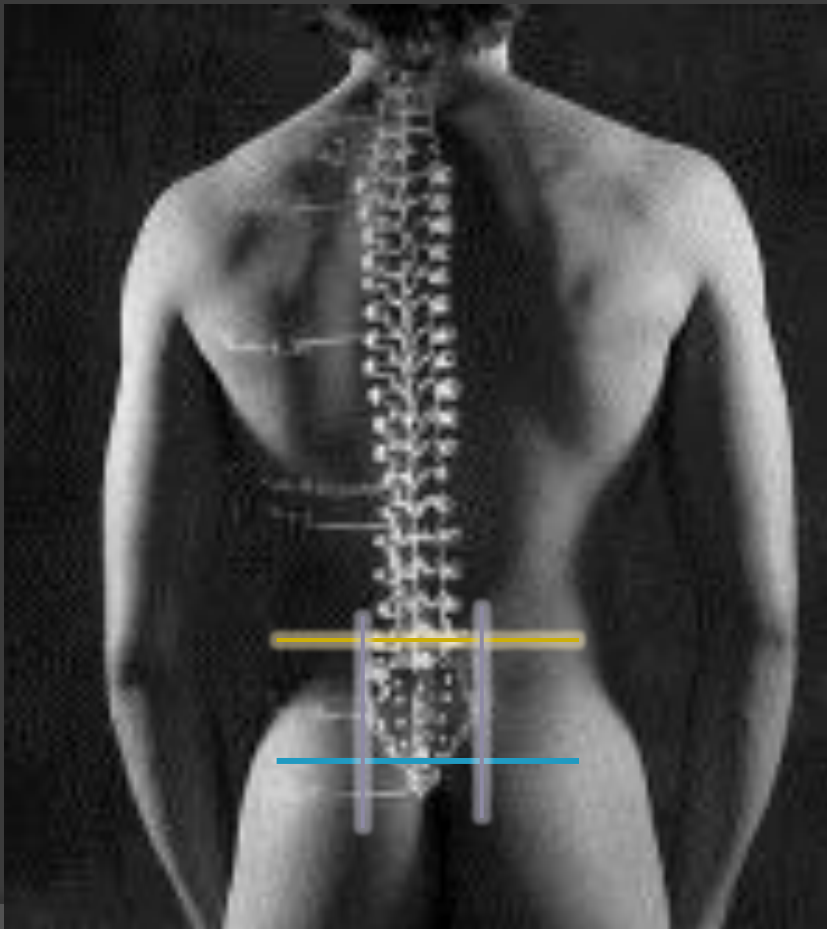
T12 spinous process

Lumbar erector spinae muscles.

S1 spinous process

Low back pain terminology

◎ Sacral spinal pain



S1 spinous process

PSIS and PSIS

Sacrococcygeal joint

What is not low back pain?

Flank / loin pain

Visceral

Gluteal pain

Local causes

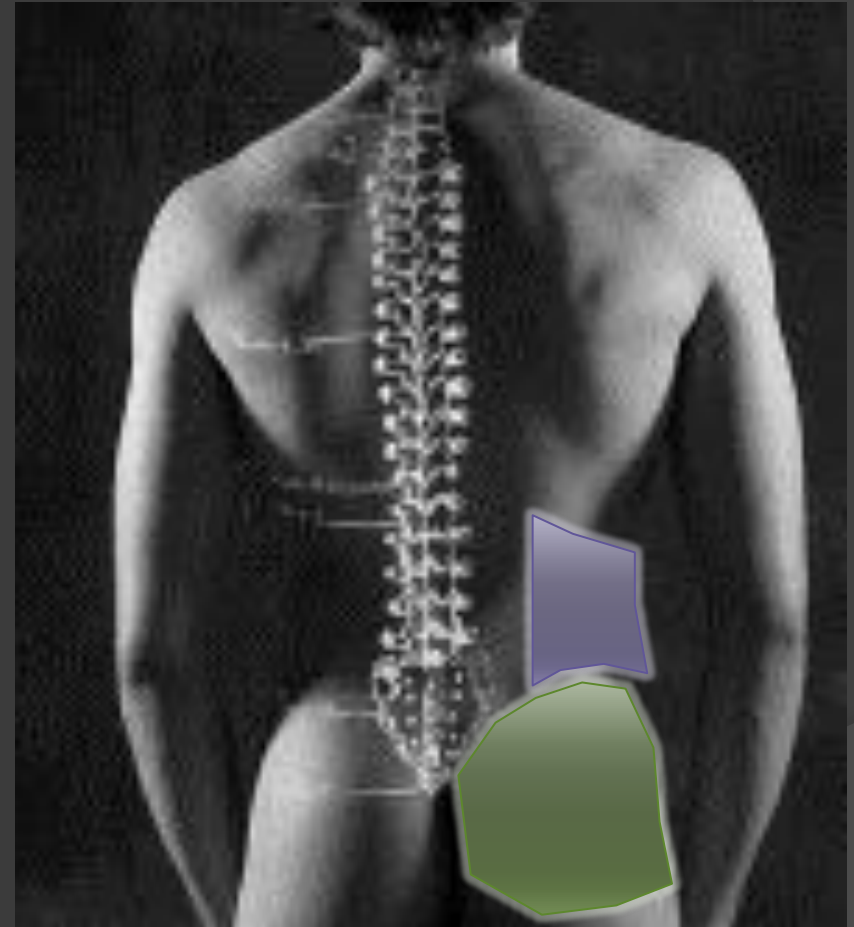
“Sciatica” (radicular pain)

Not LBP

Lower limb pain

Causes are different

Mechanisms of pain are different



Practical

Identify surface anatomy

T3 scapula spine

T7 angle of scapula

T10 ribs

L4 iliac crests

PSIS, sacrum, SIJ

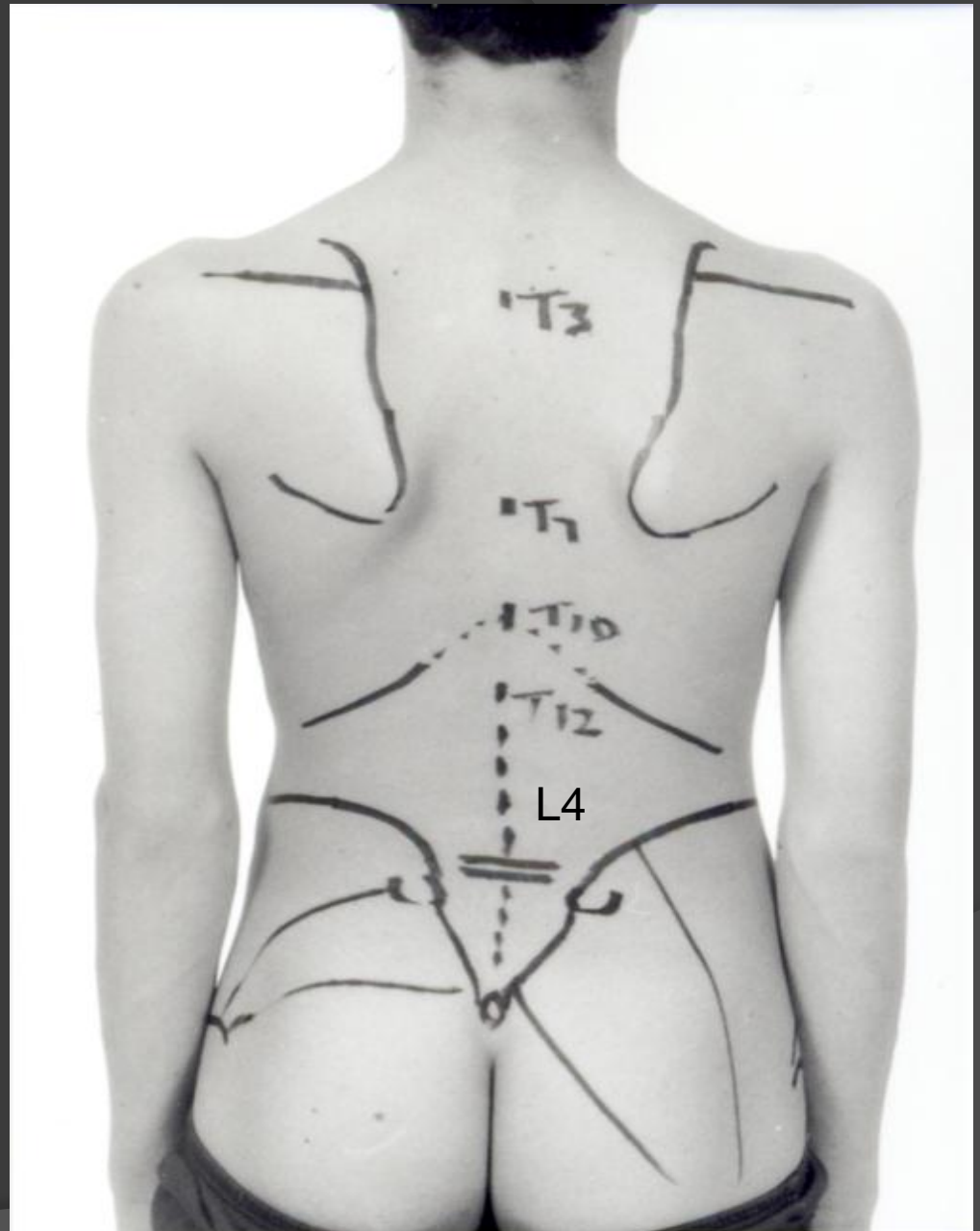
Identify lower back regions:

Lumbar

Sacral

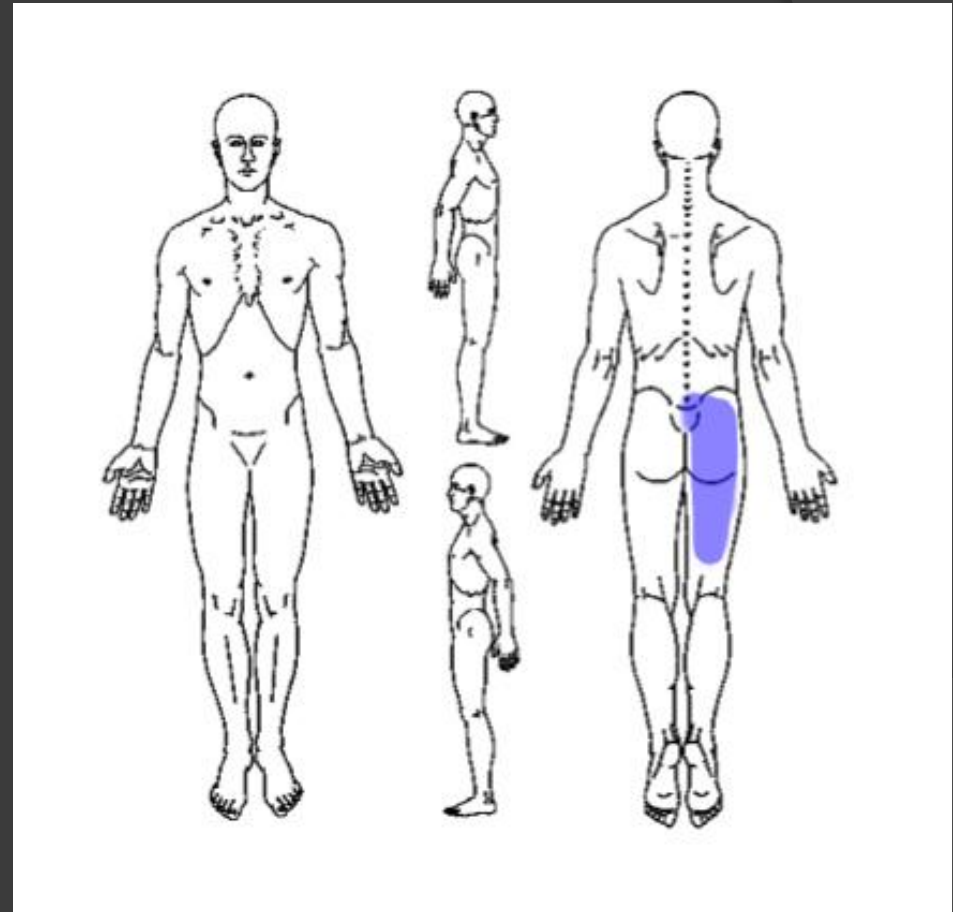
Gluteal

Loin



Case study

- 35 yo woman with LBP
i.e. right-sided
lower lumbar
sacral
gluteal pain
posterior thigh pain
 - She has leg pain associated
with lumbar pain
- Is her leg pain somatic referred
pain or radicular pain?



Somatic pain

- ◎ Pain evoked by noxious stimulation of nerve endings innervating spinal structures:

discs

zygapophysial/facet joints

sacroiliac joints

dura

ligaments

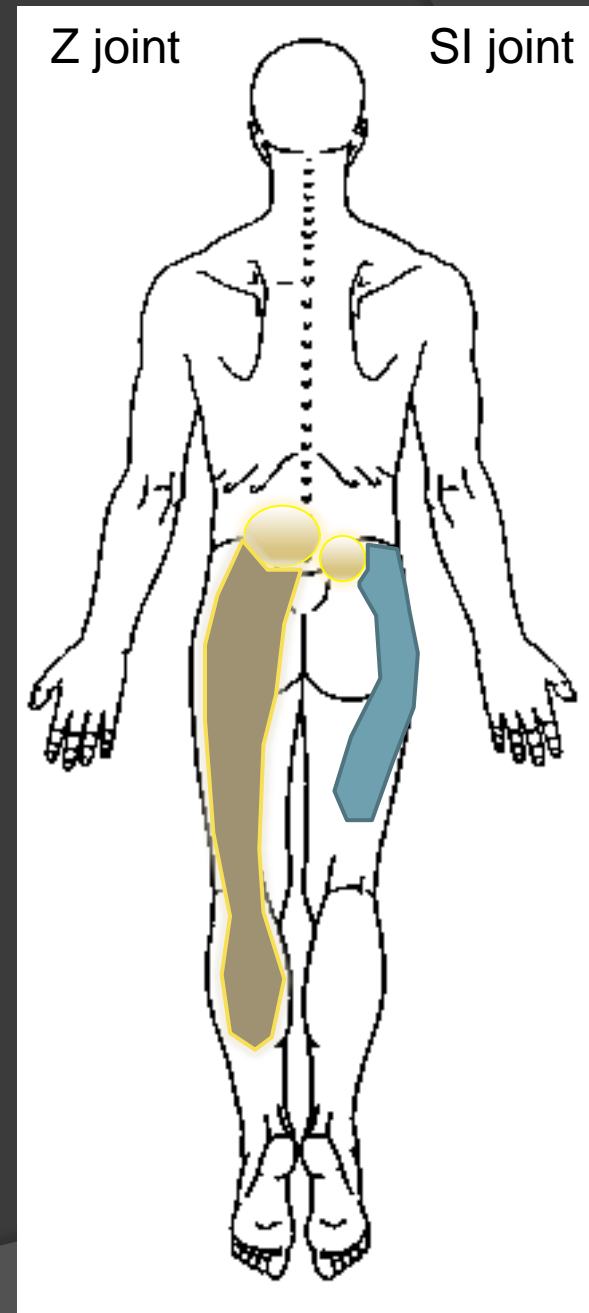
muscles

Pain can be felt **locally** and/or **referred**

Somatic structures at the same segmental level share same innervation and pain distribution, therefore the distribution of pain does not allow you to determine the anatomical source of pain

Referred pain

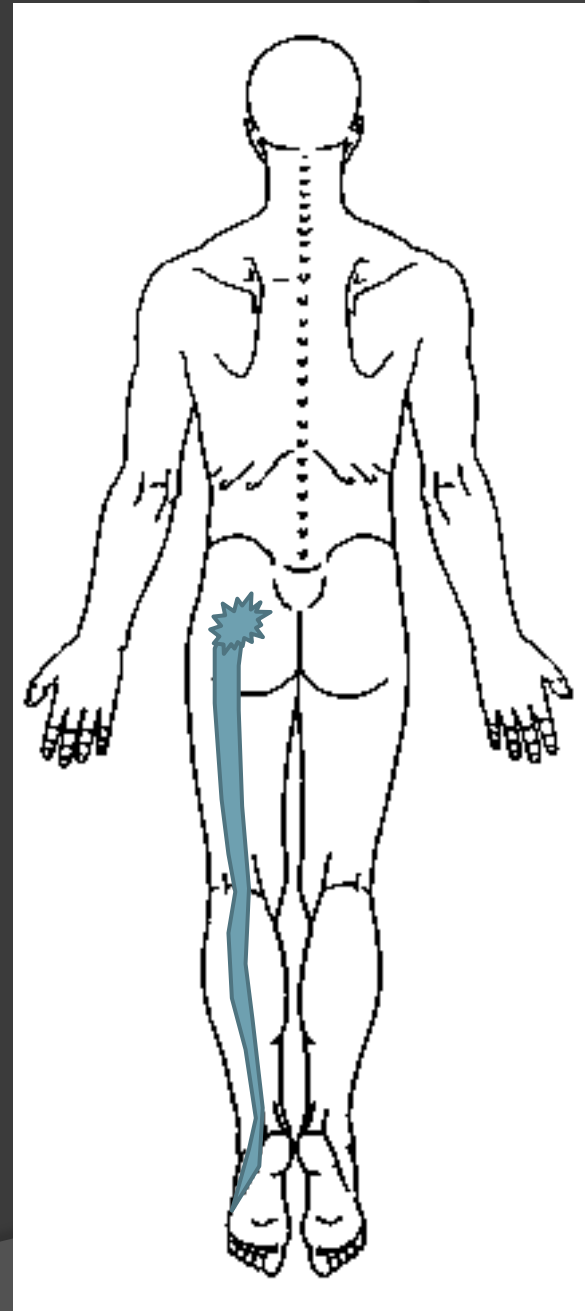
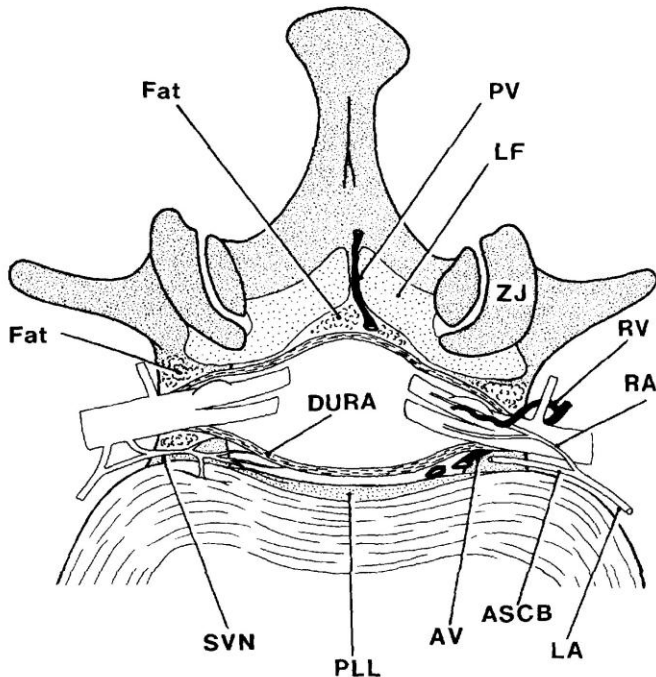
- Stimulation of peripheral endings of nociceptive afferent fibers
- Pain perceived in a region innervated by nerves other than the ones that innervate the actual source of pain



Radicular pain

Neurogenic pain

Stimulation or irritation of the nerve roots or dorsal root ganglion of a spinal nerve



Radicular pain Vs Referred pain

FEATURE	RADICULAR PAIN	SOMATIC REFERRED PAIN
Distribution	entire length of lower limb, but below knee > above knee.	Anywhere in lower limb, but Proximal > distal.
Pattern	narrow band, travelling quasi segmental but not related to dermatomes; not distinguishable by segment	wide area, Relatively fixed in location quasi segmental but not dermatomal; not distinguishable by segment. Boundaries difficult to define, but Centroid identifiable.
Quality	shooting, lancinating, perhaps like an electric shock	dull, aching, Perhaps like an expanding pressure
Depth	deep as well as superficial.	deep only, lacks any cutaneous quality

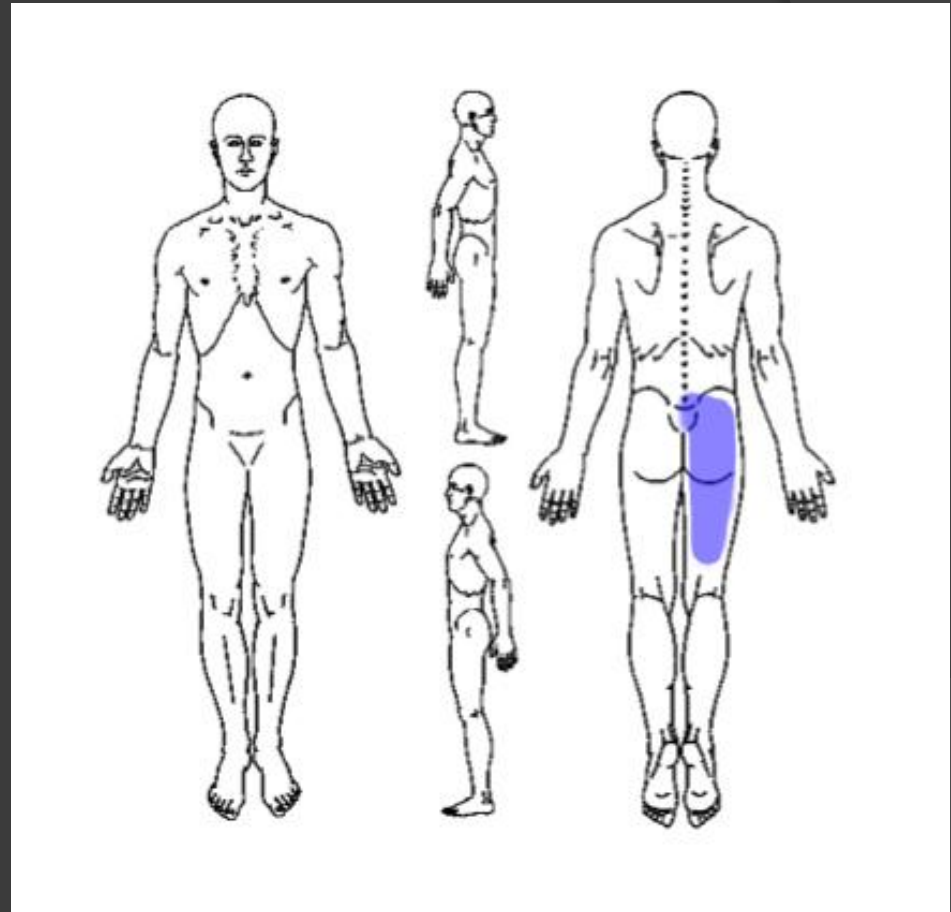
Table LR.2.10. The distinguishing features of lumbar radicular pain and somatic referred pain.

Case Study

- ◎ If her pain is somatic,
is it lumbar pain, or sacroiliac joint pain?
- ◎ Lumbar features
 - History
 - pain map: midline; if unilateral, above L5
- ◎ SIJ features
 - History
 - pain map: unilateral, below L5, groin pain, PH pregnancy, onset eg stepping into hole, jarring; spondyloarthropathy
 - Exam
 - LLD; asymmetry of iliac crests, skin folds, ASIS, PSIS; SIJ tests

Case study

- Is it lumbar or SIJ pain?
- Determine location of most severe pain
 - above L5 → lumbar
 - below L5 → SIJ
- Confirm with examination



Sacroiliac joint pain

- Consider if:

- pain entirely caudal to L5

- normal neurology

- sacroiliac provocation tests

- FABER test (Flexion ABduction External Rotation)

- POSH test (POsterior SHEer) = thigh thrust test

- Laslett et al (Australian J of Physiotherapy 2003 Vol 49)

- Distraction test

- Thigh thrust test

- Gaenslen's test

- Compression test

- Sacral thrust test

- (3 or more positive: kappa 0.52-0.88; LR 4-6)

(chronic cases: consider if XR normal & MRI normal discs)

Sacroiliac joint provocation tests



Distraction test



Thigh thrust test



Gaenslen's test



Compression test

Sacroiliac joint provocation tests



Sacral thrust test

Sacroiliac joint pain

- Pain with normal pelvic alignment

due to: sprain
 sacroiliitis
 fracture, tumour

- Pain with pelvic malalignment/SIJ dysfunction

due to: sprain, overuse, imbalance

Pelvic malalignment/SIJ dysfunction

- ⦿ height of iliac crests, PSIS, ASIS
- ⦿ leg length difference (LLD) (apparent LLD vs true LLD)
 - supine
 - long-sitting position
- ⦿ asymmetry pelvic landmarks:
 - PSIS, ASIS
 - ischial tuberosities
 - symphysis pubis
- ⦿ provocation tests
- ⦿ treatment – SIJ mobilisation (for anterior innominate)

Practical

- ⦿ 5 min examination

Examination

To identify

1. serious pathology
2. radicular features
3. SIJ pain
4. non-specific LBP – lumbar

Examination

Standing

observation: pain behaviour, posture, gait, spinal curvature, symmetry, iliac crests, skin folds, pelvic shift, wasting

movement: lumbar ROM

Supine

LLD, SLR, hips, SIJ stress tests

Neurological: reflexes, power, sensation

Prone

femoral nerve stretch, tenderness, gluteal muscles

Sidelying

gluteal muscles, perineal sensation, anal sphincter tone

Neurological Examination

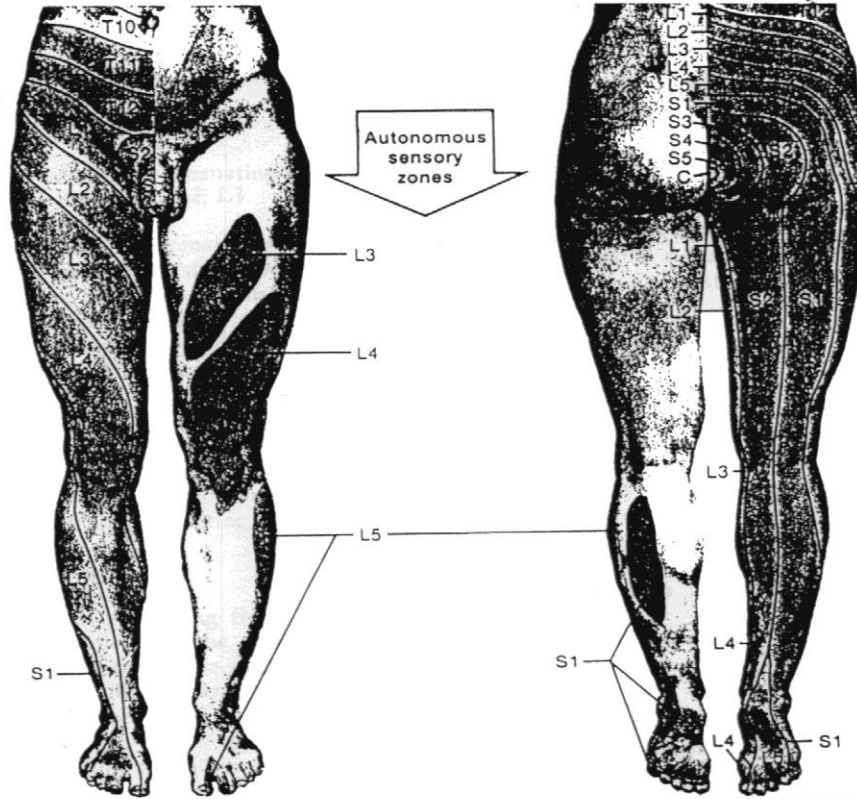
⦿ Neurological

- Gait - walking on heels (L5)
 - walking on toes (S1)
- SLR - positive if <30-40 degrees; leg pain
- Reflexes - knee L3-4, ankle S1-2
- Power - knee ext L3-4, ankle-toe ext L4-5, eversion L5-S1, plantarflex S1-2
- Sensation – dermatomes
- Femoral nerve stretch test (L2, L3)

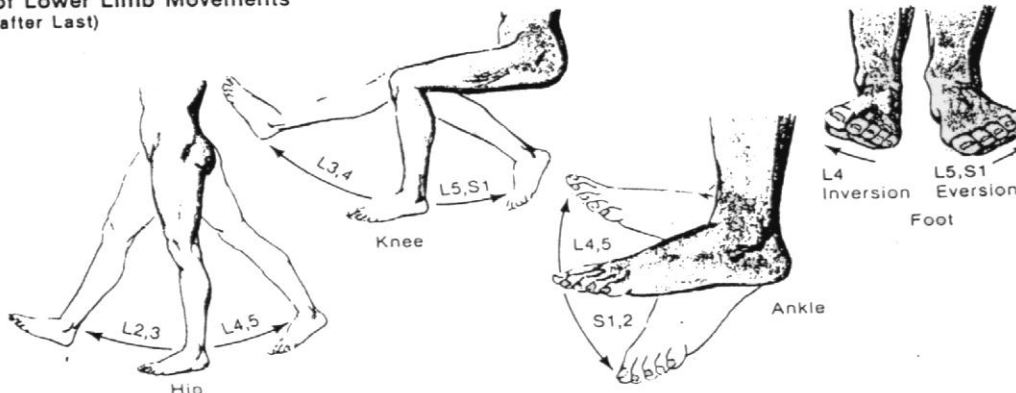
Most common L5 or S1 distribution

Neurological Examination

Segmental Sensory Innervation (Dermatomes) of Lower Limb (after Keegan)



Segmental Innervation of Lower Limb Movements (after Last)



Dermatomes

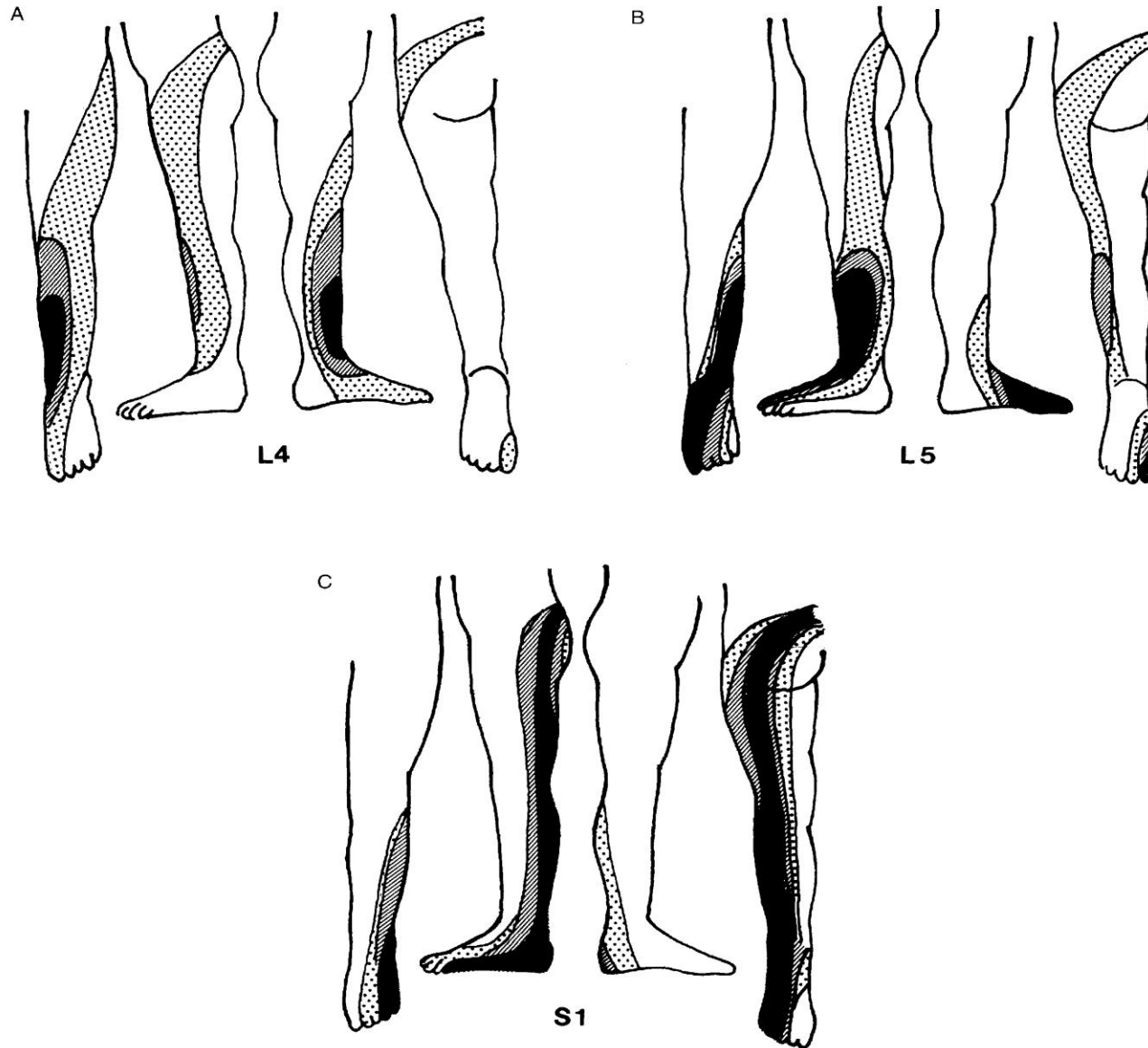


Figure 10.7 The L4, L5 and S1 dermatomes. In each figure, the dermatomes are illustrated as contours according to the percentage of individuals who exhibit the particular pattern. The black zones are exhibited by at least 75% of the population, the shaded zones by at least 50%, and the stippled zones by some 25% of individuals. (Based on Nitta et al.⁵⁶⁷)

Case study

- ⦿ Gait normal.
Spinal and trunk symmetry, curvature normal.
Right iliac crest & higher; ASIS lower. Right leg lengthening.
- ⦿ Lumbar ROM: flexion reaches the ankles and is pain-free;
extension causes mild pain across the lumbosacral spine; side bending causes right iliolumbar & gluteal pain
- ⦿ Active right hip flex is restricted to 50° and causes right gluteal pain; left hip flex reaches 70° and is pain-free.
Neuro – normal
Hip ROM is normal. FABER test normal; POSH gluteal pain.
Mild tenderness over R iliolumbar area, sacrum, sacroiliac joint and gluteal area.

Red flag conditions (see handout on website)

- ⦿ Determined by history
- ⦿ Fractures
- ⦿ Cancer
- ⦿ Infection
- ⦿ Inflammation
- ⦿ Cauda equina syndrome

Red flag conditions

⦿ Fracture

Major trauma

Minor trauma associated with osteoporosis

age >50

corticosteroid use

Red flag conditions

◎ Cancer

Weight loss	LR	2.5
Age > 50yo		2.7
PAST HISTORY		15.5
Failure to improve		3.1
Prolonged pain		2.6
ESR >50		15.3
Haematocrit <30%		15
Nocturnal pain		

Red flag conditions

⦿ Infection

Fever LR 13-41

History of: skin infection
iv catheters
UTI

Red flag conditions

● Ankylosing spondylitis

Chest expansion <2.5cm LR 9.0

4 out of 5 of: morning stiffness LR 6.3
improved with exercise
onset <40 yo
slow onset
duration >3 months

Neurological deficit

Cauda equina syndrome

result of compression of the neural elements below the end of the spinal cord (L1-2 level)

causing: severe LBP

gait bilateral leg symptoms: pain, weakness impairing
→paralysis, sensory changes

Saddle anaesthesia, perineal numbness

Urinary dysfunction: retention, difficulty starting/
stopping stream, overflow incontinence

Reduced bladder and urethral sensation

Bowel disturbance: incontinence, constipation,
reduced anal tone on PR

Sexual dysfunction

Refer urgently to hospital for assessment, surgical spinal decompression, to prevent permanent neurological damage

An algorithm for acute LBP

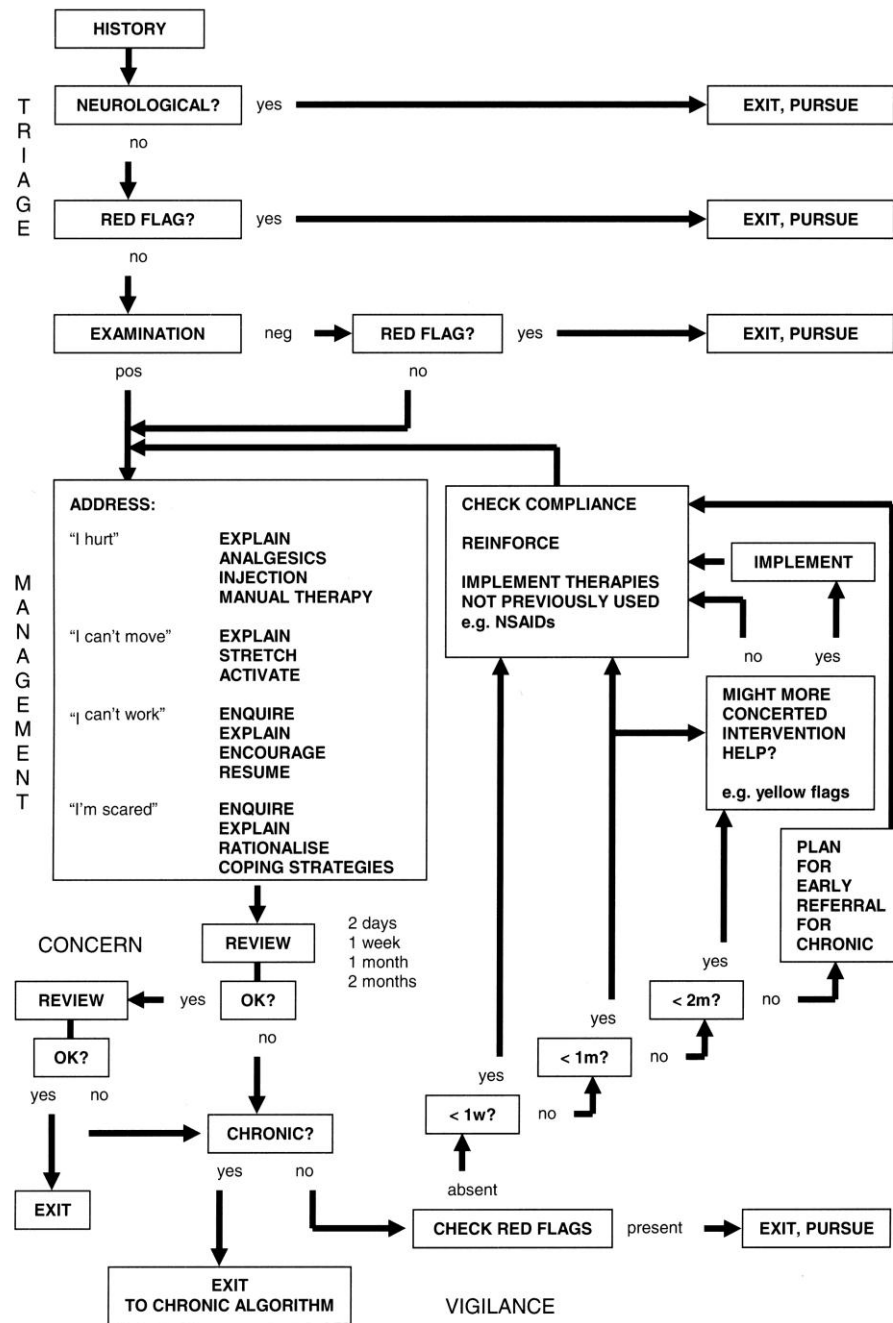


Fig. 1. An algorithm for the management of acute low back pain.

Investigations

- Red flags

major trauma or minor trauma with osteoporosis -> x-ray

Unrelenting pain, worse at night

Age <20 years, or new back pain age >50 years

History of cancer

Systemic symptoms eg fever, weight loss

IV drug use

Immunosuppression or steroids

→x-ray, FBC, CRP, alk phos, Calcium, PSA, referral

Sphincter disturbance

Gait disturbance, progressive neurological deficit

Saddle anaesthesia

→?cauda equina →refer hospital for emergency assessment

Investigations

- ◎ Non-serious conditions
= 95% of of LBP
non-specific LBP

- ◎ X-ray

most non-specific LBP does not require x-ray
false positive findings
consider radiation exposure
if no improvement after 4 weeks

Investigations

- MRI

- non-specific LBP does not require MRI

- for: unresolving radicular pain
chronic LBP

Management

- Analgesia (lacks evidence; mainly empirical)
 - provide adequate analgesia to assist mobilisation
 - paracetamol, 1g four times daily
 - Add: NSAID eg ibuprofen 400mg qid
 - Add: codeine 30-60mg 4 hourly, or tramadol 50mg 6 hourly
 - laxatives
 - ?muscle relaxants
 - tricyclics not indicated
- Heat (some evidence for heatwraps)
- Manual therapy – to encourage activity

Management (see online notes)

- Address fears

 - fear about pain can be disabling
 - contributes to disability and chronicity

- Determine beliefs and attitudes regarding condition and pain

 - F**eelings: what are your concerns?

 - I**deas: what do you understand is the cause of your back pain?

 - F**unction: how is it affecting you?

 - E**xpectations: what do you think is needed to help?

Yellow flags

- ⦿ Factors associated with poorer prognosis
- ⦿ Belief that back pain is harmful and potentially severely disabling
“I hurt”, “I can’t move”, “I can’t work” and “I’m scared”
- ⦿ Avoiding behaviours for fear of damaging back
- ⦿ PH chronic pain, somatisation, preoccupation with health
- ⦿ Negative attitudes and outlook; tendency towards lowered mood and social withdrawal
- ⦿ Expectation that passive treatments will help more than active participation

Management

- Provide reassurance

 - offer biological model of the pain

 - e.g. sprained ligaments, muscles, disc; takes days to weeks to heal; gradual return to activity

 - no sign of serious disease

 - most acute LBP gets better

 - most resolves < 2weeks

 - 70-90% < 3 months

 - relapses possible; overall recovery

Management

pain occurring with movement does not indicate ongoing damage; therefore light activity not harmful

muscle tension and spasm can be relieved with stretching and light activity

Management

- Encourage activity

stay active in spite of pain rather than waiting
for pain to settle completely

Management

- ◎ Encourage activity

stay active despite pain rather than waiting for pain to settle completely

continue normal activities if possible

continue work:

- speeds recovery, reduces recurrences

- selected duties rather than off work

- if unfit for work, RTW ASAP; do not wait until pain-free

Management

- ◎ Encourage activity

- stay active despite pain rather than waiting for pain to settle completely

- continue normal activities if possible

- continue work:

- speeds recovery, reduces recurrences

- selected duties rather than off work

- if unfit for work, RTW ASAP; do not wait until pain-free

- teach simple stretches or refer to physiotherapist for exercises

- walking, swimming/aquajogging

Management

- ◎ Encourage activity

- stay active despite pain rather than waiting for pain to settle completely

- continue normal activities if possible

- continue work:

- speeds recovery, reduces recurrences

- selected duties rather than off work

- if unfit for work, RTW ASAP; do not wait until pain-free

- teach simple stretches or refer to physiotherapist for exercises

- walking, swimming/aquajogging

- bedrest is harmful; delays recovery**

Management - practical

- ⦿ Manual therapy
 - flexion
 - rotation
 - extension
- ⦿ Lumbar stretches/self-treatment
 - flexion
 - rotation
 - extension
- ⦿ SIJ mobilisations
 - for anterior innominate
 - general mobilisation
 - self-treatment

Management (see algorithm)

- Review regularly (few days to weekly) to:
 - develop relationship with patient
 - monitor progress
 - reinforce active participation
 - reassure
 - assess for red/yellow flags
- After 4 to 6 weeks:
 - if not resolving
 - x-ray, bloods
 - refer for specialist assessment

An algorithm for acute LBP

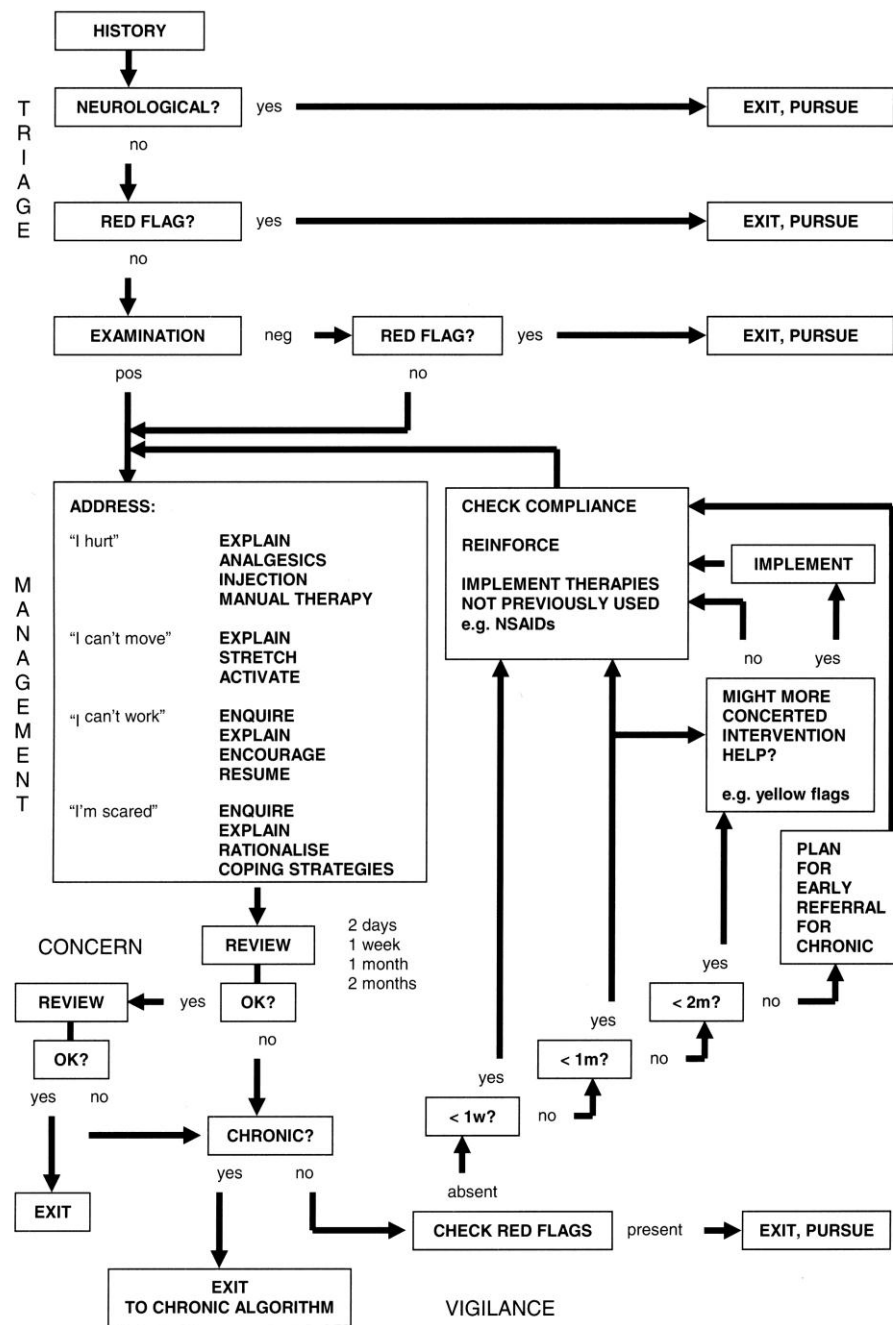


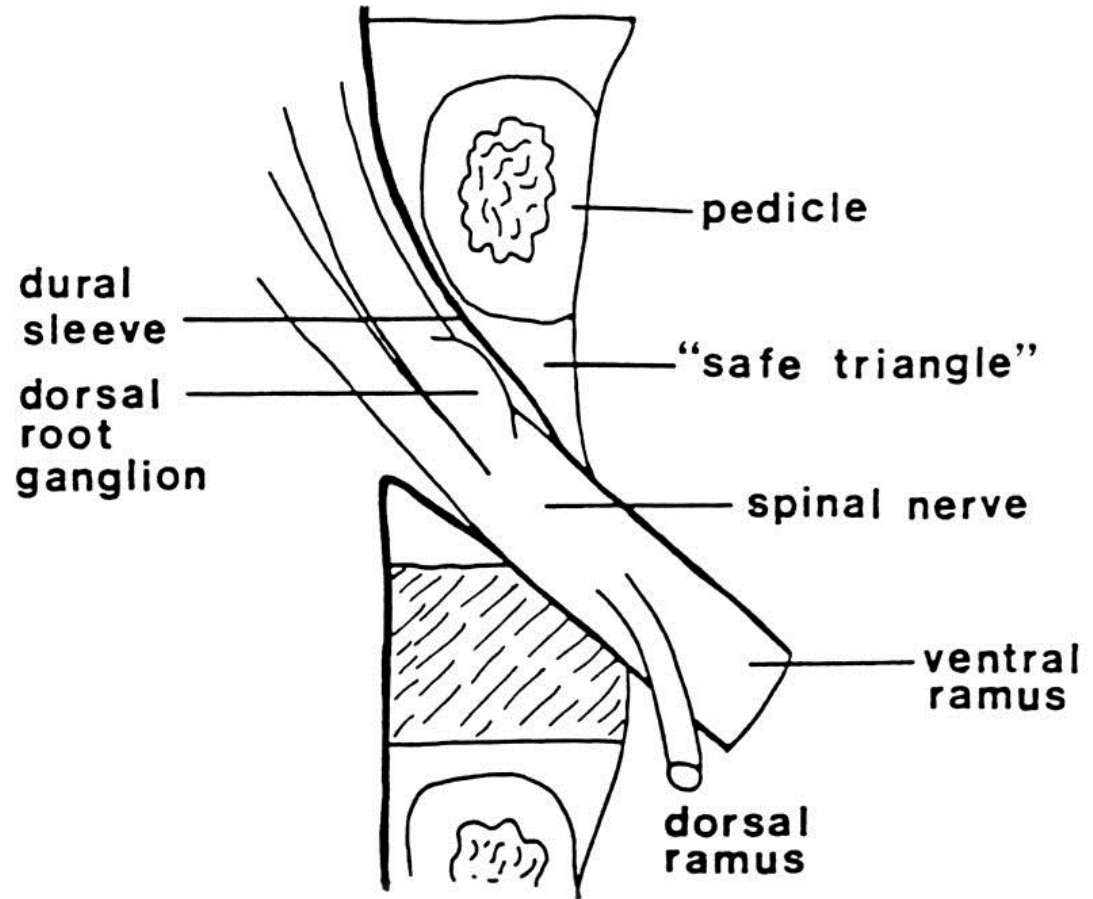
Fig. 1. An algorithm for the management of acute low back pain.

Radicular pain

- 50% resolve < 4weeks
- 90% start to improve < 6weeks, resolve <12 weeks
- no need for x-rays
- ADEQUATE ANALGESIA - tricyclics

- if no improvement over 4-6 weeks
 - x-ray
 - refer specialist
 - assessment
 - pain management
 - MRI
 - TFI (TransForaminal Injection of steroid)

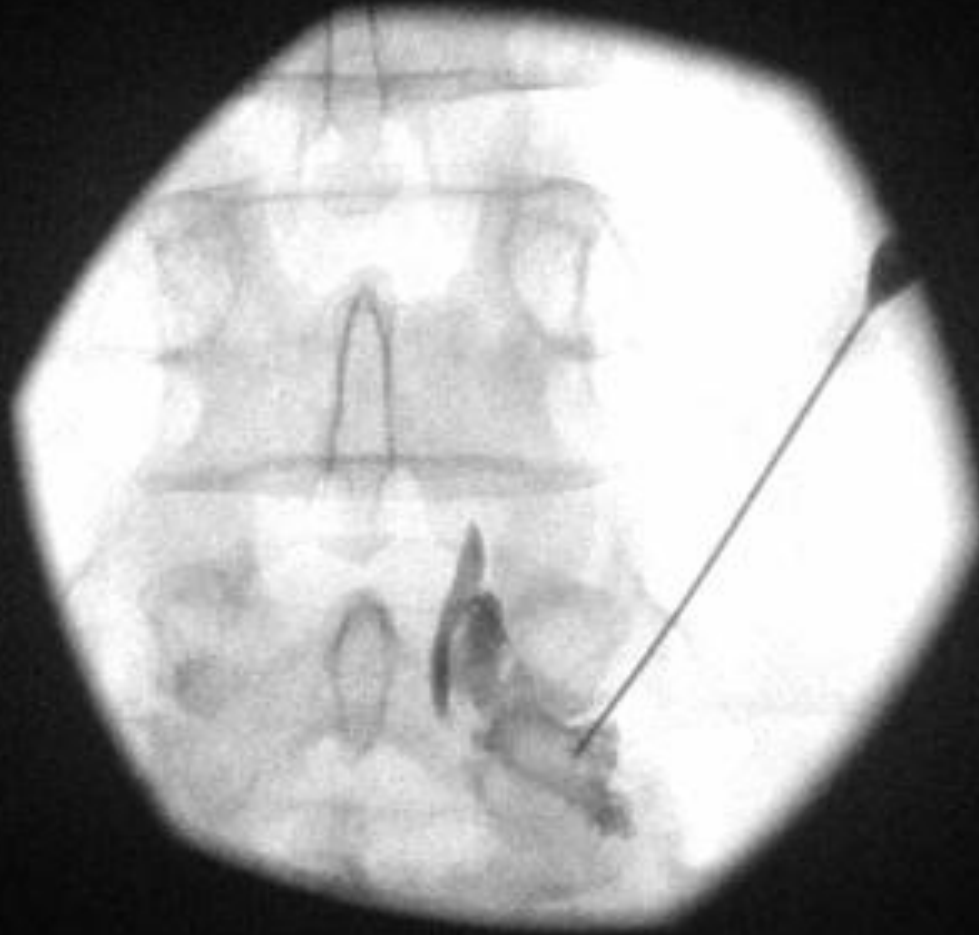
Transforaminal injection of steroid



The 'Safe Triangle'

The exit of the ventral ramus through the intervertebral foramen. Above the exiting nerve root lies a 'safe zone' for transforaminal epidural injection

Transforaminal injection of steroid



Chronic Low back pain — see Website handout

Validated sources of CLBP:

- lumbar intervertebral discs - prevalence 40%
- zygapophysial joints (Z joints) = facet joints
10 -15% younger injured workers; 40% older non-injured population
- Sacroiliac joints - 15 -20%

Procedures for investigation of chronic LBP (ISIS protocol)

- provocation discography
- zygapophysial (facet) joint blocks
- sacroiliac joint blocks

Chronic Low back pain

- Intervertebral disc
 - diagnosis
 - rehabilitation exercises
 - activity modification
 - surgery
- Facet joint
 - intra-articular injections
 - medial branch nerve blocks ->radiofrequency neurotomy
- Sacroiliac joint
 - pelvic mobilisation
 - intra-articular injections
- Chronic Pain Syndrome/centrally mediated pain/central sensitisation
 - explanation
 - medication
 - exercise
 - psychological management

THE END

Handout on GPCME Website

NZ Association Musculoskeletal Medicine

www.musculoskeletal.co.nz

Dr Charles Ng

cng@achillesheal.co.nz

