Low Back

Low back pain is a major cause of disability, economic cost and GP visits.

Like most of the body it is incredibly well designed but when it falters it can do so dramatically.

The requirement for strength outweighs the need for flexibility. This is reflected in the structure

Structure of the low back

A narrow view of the low back includes the 5 lumbar vertebra and their associated muscles, ligaments and fascia.

A more inclusive and structurally meaningful image includes the pelvis (which also must be considered part of the lower limbs) and the abdominal muscles and fascia. Seen this way the low back becomes more a hollow tube than a massive pillar, relying on all the muscles of this tube for stability, and on the pelvis and the sacrum for support.

Lumbar vertebral column and sacrum

The compressive force of the upper body is borne and transmitted by this structural complex.

3 bony pillars - vertebral bodies + articular pillars
- have limited movement (strength vs flexibility)

Ligaments: - Anterior Longitudinal Ligament
- Posterior Longitudinal ligament
- Ligamentum flavum
- Ilio lumbar ligaments

Muscles: muscles in front of the spine
- psoas
- abdominals

muscles beside the spine
- quadratus lumborum
muscles behind the spine
  erector spinae (iliocostalis, longissimus)
  transversospinalis (multifidus)
  segmental muscles (interspinales, intertransversarii, and rotatores)

The extensors are enclosed in a dense fascia called the thoraco-lumbar fascia

Nerves: Inside the spinal canal and inside the dura mater the ventral nerve roots carry sensory information into the spinal cord and the dorsal nerve roots carry motor information away from the cord. These nerve roots merge to form a spinal nerve that exits the spinal canal through the intervertebral foramen. The spinal nerve divides outside the spinal column into a dorsal and ventral ramus. The dorsal rami innervate everything contained by the thoraco-lumbar fascia and the ventral rami innervate everything else.

Pathology
Low back pain, unlike neck pain, tends to come from either muscular or intervertebral tissues and tends to fall into several main categories for which a standard treatment tends to work. Zang-fu categories are less useful unless you are using herbs.

Treatment aims to disperse stagnation so the diagnostic process must locate that stagnation. This is difficult in many cases.

Diagnosis
Firstly - differentiate between joint and muscle pain
Secondly – find the location of the stagnation

Case History
Ask: nature of main symptoms – pain, paraesthesia, stiffness
   location – get patient to indicate with their hands.
Timing – daily onset, precipitating activity etc
Variability – aggravation, amelioration
History – this episode then from the beginning

• Recognition of pain pattern
  o Trigger points have predictable referral patterns
  o Joints often refer in predictable dermatomal pattern
  o Referral down below knee: joint > muscle

• Onset -
  o with use – muscle > joint
  o on waking or after immobility – joint > muscle

• History
  o Months – joint > muscle

Exam
Move: Active movement when standing - restricted and painful flexion - disc
  • Pain produced during movement muscle > joint
  • Pain produced at the end of movement – joint > muscle

Slump test if leg symptoms present - if positive nerve compression

Feel: Location of worst stagnation in appropriate area is often the most reliable sign
  Muscle
  o Tenderness over muscle belly or tendon
  o Jump sign
  o Palpable nodule or band

Joint
  Main tenderness over joint (under huatuo point or BL 28 for SI joint)
  Provocation tests
<table>
<thead>
<tr>
<th>Red Flag</th>
<th>Possible Cause</th>
<th>Usual Action</th>
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<tbody>
<tr>
<td>• major motor weakness and numbness, or progressing neurological deficit</td>
<td>Cauda Equina Syndrome</td>
<td>Immediate referral for MRI or CT and specialist assessment</td>
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<td>• sphincter disturbance (urinary retention, bowel or bladder incontinence)</td>
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<td>• saddle anesthesia (numbness in inner thighs and perineum)</td>
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<tr>
<td>• initial onset at over 55 years</td>
<td>Infection, Tumor or Pathologic Fracture</td>
<td>Referral for medical assessment</td>
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<td>• non-mechanical pain (unrelenting, unaffected by position, severe nighttime pain)</td>
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<td>• history of cancer or suspicious physical finding (i.e.; acute localized bone pain)</td>
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<td>• unexplained weight loss</td>
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<td>• fever, night sweats</td>
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<td>• HIV, IV drug use, immunosuppression</td>
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<td>• Recent significant trauma</td>
<td>Fracture</td>
<td>X-Ray</td>
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<tr>
<td>• Known or suspected osteoporosis with or without recent trauma</td>
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LEVEL OF HERNIATION

- L 3/4 disc L 4 nerve root
- L 4/5 disc L 5 nerve root
- L 5/S 1 disc S1 nerve root

PAIN

- Lateral hip, antero-lateral thigh, medial leg
- Over sacro-iliac joint, hip, lateral thigh and leg
- Over sacro-iliac joint, buttock, posterior thigh, lateral calf and foot

NUMBNESS

- Antero-medial thigh above knee
- Lateral leg, dorsal web of big toe
- Lateral calf, lateral leg and side of foot, sole of foot

WEAKNESS

- Knee extension
- Dorsiflexion of big toe, difficulty walking on heels
- Plantarflexion of big toe, difficulty walking on toes

REFLEXES

- Patellar reflex diminished
- None
- Achilles reflex diminished

PROVOCATION

- SLR
- SLR
Treatment

Acute pain

If quite acute – within days of onset – a possible form of treatment is to use one or more of the empirical points. These are a series of points that, when strongly stimulated while the patient moves their low back, are reputed to clear the stagnation in the channels and provide rapid relief from pain. These points are:

GV26
Yaotongdian – one point is half way between the 4th and 5th metacarpals and the other is between the 2nd and 3rd metacarpals.
Lu 5
Bl 40
Si 3

Intervertebral – Joints, discs, ligaments

Local treatment:
Main points;
• Huatuo jiaji pts at affected level(s) on affected side(s)
• Bl 25 (Dachangshu) - for low lumbars
• Bl 23 (Shenshu) - for upper lumbars or if Ki involvement

Secondary points:
• ah shi pts for secondary muscular involvement – common culprits are QL, multifidus at Bl 32, the attachments of the abdominal muscles near GB 25, 26 and Liv 14, Yaoyan
• low thoracic points - inner or outer Bl
• ah shi pts near Bl 54
• Du pts if indicated

Distal treatment:
Main points
• BL 40 (Weizhong)
• BL 58 (Feiyang) - is an alternative

Secondary points
• local points for secondary irritation from referred pain (rarely necessary)
• points for eliminating xie qi if indicated e.g. SJ 5, GB20, Bl 12
• points for internal component eg BL, 18, 21, 20, 23, Sp 6, Sp 9, Liv 3
• Jing (river) pts on yin meridians (Ki 7, Liv 4, Sp 5)
Electro stimulation is often very effective in shi patterns of low back pain, even when they are chronic. My personal favourite points for using electro are the main huato point and BL 54. Other combinations I have used with success are huato + BL 25, and huato + BL 58.

Muscular causes
Treatment involves direct needling of ah shi points. If using myofascial trigger point model then just choose the most tender points. If using jingjin model use more points along a line or pathway.

BL jingjin
- Multifidus
- Longissimus
- Iliocostalis
- Sacro-tuberous ligament
- Hamstrings – esp. short head of biceps

GB jingjin
- Quadratus lumborum
- Gluteus medius
- Gluteus minimus

St jingjin
- Rectus abdominis

Sp jingjin
- Psoas
Rectus abdominis

Piriformis
Acute
- Sudden onset
- Always an event – even if it seems trivial
- No neurological symptoms

Chronic
Tends to have some behaviour that keeps initiating or maintaining the overload
- Posture
- Use

Diagnosis – think in terms of trigger points and jingjin

Trigger points
- Recognition of pain referral pattern
- Palpate appropriate muscle – looking for:
  - tenderness,
  - jump sign
  - palpable tissue change

Jingjin
- Recognition of affected meridian
- Palpate both ways along affected meridian from symptomatic area looking for tenderness and palpable tissue change
The Thoracic Spine and Rib cage

The **thoracic spine** is that section of the spine that supports the ribs. The thoracic spine, ribs, sternum and associated soft tissues form the thoracic cage or **rib cage** which protects the heart and lungs and makes breathing possible. The rib cage and its contents form the **thorax** which is separated from the abdomen by the diaphragm.

There are 12 thoracic vertebrae which have the following features:
- vertebral bodies are heart-shaped and are smaller than those of the lumbar spine and larger than those of the cervical spine.
- transverse processes have a distinctive broad shape and those of T1 to T10 have a facet on their anterior face for articulation with a rib.
- spinous processes project more inferiorly than cervical or lumbar spinous processes.

The thoracic vertebrae are designed primarily for flexion and extension although they allow a very limited degree of rotation and side bending.

There are 12 pairs of ribs.
- Ribs 1 - 7 are joined to the sternum by a costal cartilage
- Ribs 8 - 10 have costal cartilages that fuse and become continuous with the 7th costal cartilage
- Ribs 11 and 12 are free floating with their anterior ends not joined to the sternum

The articulation between a rib and its costal cartilage is called a costo-chondral joint. The articulation between the costal cartilage and the sternum is called a sterno-chondral joint.

The ribs are connected to the spine by synovial joints with both the vertebral bodies and the transverse processes and by strong supporting ligaments.

The muscles of respiration (principally the diaphragm and the intercostals) attach to the ribs. Breathing occurs as the volume of the rib cage is increased (inspiration) and decreased (expiration).
Disorders of the Thoracic Spine and Ribcage

The demands of posture, neck movement, shoulder and arm use, and breathing interact in the upper back. If these demands are excessive or in conflict, painful mechanical problems can occur. These tend to be either segmental (problems of the inter-vertebral joints or discs and the associated ribs) or myofascial in nature.

Pain from neck problems can, and often does, radiate down to the mid-thoracic and interscapular area. The source can be myofascial (levator scapula or splenius cervicus), articular (C5/6, 6/7) or neurological (C5, C6 nerve roots). Suspect referral from the neck if the thoracic pain can be reproduced or aggravated by neck movement.

Pain can also be referred from the thoracic and abdominal organs, particularly the heart, lung, liver, gall bladder and pancreas. Be particularly alert if the patient also presents with internal symptoms.

Myofascial

There are several large muscles that lie against parts of the ribcage that can produce characteristic patterns of pain when overloaded. Two of these are essentially shoulder muscles but because their pain referral patterns are experienced as thoracic pain they are described here.

Latissimus dorsi

This muscle is overloaded through vigorous use rather than posture. The pain tends to be felt between the mid thoracic spine and the inferior angle of the scapula. The likely location of the trigger point is between the inferior angle of the scapula and the axilla and is best found by rolling the muscle between the thumb and fingers with the patient supine.
This muscle is best needled with the patient supine. Use a 75mm (3 cun) for ease of insertion and manipulation.

**Serratus anterior**

Serratus anterior can be overloaded through exercise, coughing or dysfunctional breathing such as found in anxiety states. The pain is felt on the side of the ribcage and medial to the inferior angle of the scapula. The active trigger points are usually found in the mid axillary line near or above Sp 21.

Check Latissimus dorsi and Scalenus anterior and medius if trigger points are found in this muscle. Needle with extreme care. Oblique insertions are the safest.
**Serratus Posterior Superior**

Trigger points in this muscle are responsible for a deep ache under the scapula that can radiate to the back of the arm, the olecranon and medial epicondyle and the ulnar aspect of the hand. The pain is felt at rest. The scapula needs to be protracted to expose the tight bands near the insertion on the ribs.

The causes of overload are dysfunctional breathing and posture. Symptoms are often worse for fatigue.

Needle obliquely (no more than 30°) and laterally from just lateral to the outer UB line so that the needle slides into the most tender spot under the scapula. Use up to 3 needles if the stagnation is severe.

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**Vertebral and rib dysfunction**

**Simple inter-vertebral dysfunction**

The intervertebral segments are a common source of posterior thoracic pain. The pain usually comes from the facet joints or the small muscles that overlie them, but in some cases it is produced by disc damage or nerve root irritation. Acupuncture treatment seems to affect all these tissues so there is usually no need to try and differentiate the offending tissue.
Diagnosis
The pain — is usually paravertebral, although it can also radiate round the associated rib.

is usually felt close to the affected segments
can be aggravated or provoked by movement of the thoracic spine

The hyperextension test can often identify the most dysfunctional segments
There will be sufficient stagnation palpable in the affected segments. This can only be detected by thorough palpation. Check Du, huatuo, inner and outer Bl points.

Treatment
There are 7 points that lie across each thoracic segment - an outer Bl, an inner Bl and a Huatuo point on each side and a Du point in the middle.

There will be one or two segments that are the most affected. Choose between 2 and 4 of the points that cross each segment according to the severity of the stagnation felt on palpation. Include the Du point if it is tender.

Sometimes other patterns can seem more appropriate than a simple segmental analysis. For instance:
Diagonal, along one side, alternating

Cupping, particularly sliding cupping can be a good way of treating the thoracic spine.

Simple rib dysfunction
The ribs have stong joints with the thoracic vertebrae and tend to be affected by inter-vertebral dysfunction. By including the outer Bl points that lie over the angles of the ribs and the insertions of Iliocostalis in the points that affect the intervertebral segment, most simple rib dysfunction can be treated by addressing intervertebral dysfunction.

If a particular rib seems to be at the core of a particular presentation then in addition to treating the intervertebral segment, ah shi points along the intercostal spaces above and below the rib can be effective. Points in the mid axillary line and the Ki points near the sternum are particularly useful.
**Rib fracture**
Fractured ribs will recover well without treatment. However, acupuncture treatment can give significant relief and assistance to healing that some patients will consider it worthwhile.

Rib fracture should be suspected if there is a history of trauma and palpation of the rib reveals extreme tenderness in a discrete area. X-Rays are needed to confirm the diagnosis.

Inner and outer UB points at the affected level.
Two ah shi points on either side of the tender area. Electrostimulation can be used on these two points.
GB 34 (Yanglingquan)
Ear point
Liniment: Zheng Gu Shui

**Chest Pain**

Several distinct syndromes can cause pain in the chest. Diagnosis usually presents no problem. Most chest pain is somatic in nature; cardiac or pulmonary pain is comparatively rare.

**Pectoralis major trigger points**
Active trigger points in the lower part of Pectoralis can refer pain to the chest. These are best palpated by putting a thumb in the axilla and rolling and squeezing the muscle between the thumb and the fingers.
Costochondritis and Sternochondritis

The joints at either end of the costal cartilages can become inflamed. Costochondritis is more common, particularly in women over 40. It can occur without significant trauma. Sternochondritis is usually a result of trauma to the sternum from open heart surgery. Both respond very well to acupuncture treatment.

Exquisite tenderness and some tissue change at the affected costochondral or sternochondral junctions

There may be associated swelling

An ah shi pt in the intercostal spaces above and below the affected junction. Use electrostimulation between these points

St 36 (Zusanli)