Axial Pain

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BACK PAIN (LUMBAGO)

1. **EPIDEMIOLOGY**
2. **ETIOPATHOPHYSIOLOGY**
3. **CLINICAL FEATURES**
4. **DIAGNOSIS**
5. **TREATMENT**
6. **RECOMMENDATIONS**
7. **REFERRAL**

**BACK PAIN (LUMBAGO)**

**EPIDEMIOLOGY**

Back pain is ubiquitous - lifetime PREVALENCE approaches 80% (prevalence increases with advancing age).

• 1% of U.S. population is chronically disabled because of back pain.

**ETIOPATHOPHYSIOLOGY**

Most causes are benign!

1. **Degenerative disorders** (disk protrusion, spondylosis, spinal stenosis, scoliosis, spondylolysis, spondylolisthesis)
2. **Injury** (fracture, subluxation, ligamentous sprain, muscular strain, whiplash injury)
3. **Inflammatory disease** (ankylosing spondylitis, RA, psoriatic arthropathy, ankylosing spondylitis)
4. **Metabolic** (Paget’s disease, osteoporosis)
5. **Tumors** (bone/neural, metastatic, multiple myeloma)
6. **Infections** (herpes zoster, disk infections, epidural abscess, meningitis, osteomyelitis)
7. **Referral** (abdominal / pelvic viscera, retroperitoneal processes)
8. **Psychogenic pain** (chronic anxiety states, depression, conversion reaction, psychos, litigation-related, malinger, chronic pain syndrome, substance abuse)

**CLINICAL FEATURES**

**MUSCULOSKELETAL pain**

1. Back pain is nonradiating; if it radiates it is usually not below knees ≠ imitates radiculopathic pain (but not burning and not in dermatomal, rather in sclerotomal pattern).
• usually due to hamstring tightness, sacroiliac / hip disease pain
   can also radiate but not below knees
2. Restricted range of motion (esp. forward flexion, lateral flexion & rotation; backward extension is normal) - by pain or muscle spasm.
3. ≠ Localized tenderness over spinous process (suggests vertebral involvement by tumor or infection)
4. Flattening of lumbar lordosis with asymmetry in appearance of paraspinal muscles – due to muscle spasm.
5. Trigger points may be present (define certain myofascial pain syndromes).
6. Absence of neurological deficits
   - positive Lhermitte’s sign - suspect spinal cord compression.
• in absence of injury or any significant neurologic findings, detailed investigation is usually unrewarding.

**Mechanism**

1) irritation of nerve endings at sites of injury / inflammation (e.g. herniated disc irritating annulus fibrosus & posterior longitudinal ligament)
2) spasm of paraspinal muscles
   - Paraspinal muscles are pain-sensitive and are probably most common source of neck or back pain!

**Pain occurs**

a) typically - after unaccustomed exercise ≠ (esp. when previous conditioned state is lost due to weakened abdominal muscles).
• e.g. lifting heavy object or trying to perform activity that requires use of back muscles that have not been used for some time
b) occasionally - spontaneously (often on awakening in morning).

Local pain that does not vary with changes in position suggests tumor, infection, fracture, or referred pain

**SPINAL STENOSIS** pain is worse with walking and bending backward and relieved by bending forward
   – marked stiffness of all movements may be indicative of ANKYLOSING SPONDYLITIS.

**ONCOLOGIC pain**

• constant unremitting, in atypical or multiple sites.
• unrelated to activity or posture

N.B. pain of vertebral metastases is often aggravated by recumbency (may be relieved by sitting up!)

**REFERENCES**
Most acute cases are short lived and respond to symptomatic measures! Caring for patients is exactly that: caring. A Red flag diagnostic approach – certain historical & clinical clues are elicited to assess probability of serious disease – to distinguish patients needing additional tests (X-ray → MRI/CT) from those who may benefit from trial of conservative care (or at least not be harmed by such trial): Red flags - symptoms & signs rarely encountered in benign forms of back pain:

1. History
   1) new back pain in young patient (< 20 yrs)
   2) new back pain in older patient (> 50 yrs)

2. Present complaint
   1) pain that worsens at night that is not relieved by any position
   2) thoracic pain (dissecting aneurysm)
   3) bilateral radiculopathy
   4) periapical numbness / paresthesia
   5) change in bladder or bowel function
   6) writhing pain
   7) significant lower limb weakness not explainable by pain
   8) progressive neurologic deficit

3. Physical examination & laboratory findings
   1) pulsatile abdominal mass (or enlarged aorta shadow on lumbar radiograph)
   2) fever
   3) neurologic deficit not explained by monoradiculopathy

4. Lack of symptom pattern compatible with benign disease
   1) new back pain in older patient (> 50 yrs)
   2) new back pain in young patient (< 20 yrs)

5. Lack of response to conservative measures
   Indications for imaging (usually plain X-ray & MRI): Red flags
   1.  Red flags
   2.  Neurologic deficits
   3.  Pain in uncommon sites (e.g. lower thoracic region)
   4.  Children
   5.  Risk factors for fracture (trauma, steroid use, osteoporosis)

MRC spine stabilization trial – surgical stabilization vs. intensive rehab for chronic LBP

Back Pain
Spin19 (2)
MUSCULOSKELETAL pain
• Immobilization & bed rest (no agreement of optimal duration – 1-3 days is usually adequate) → increasing mobilization.
  – Back pain: hips and knees flexed relieve muscle spasm.
  – Neck pain: soft cervical collars* limit neck movements (spontaneous and reflex) that exacerbate pain (use collar for ≤ 4 days – risk of neck muscle weakness). cervical pillow (or towel rolled up) placed under neck when reclining or sleeping.
    • Often worn in reverse to allow for neck flexion
• Physical therapy (extent of any benefit is unclear; little evidence that traction, ultrasound, diathermy, acupuncture, or manipulation is helpful).
  – manipulation may help pain caused by muscle spasm alone but may aggravate arthritic joint or further rupture disk.
  – diathermy (deep heat) may reduce muscle spasm and pain after acute stage.
• NSAIDs - usually sufficient to relieve pain; in severe cases – narcotics.
• Muscle relaxants (relieve painful muscle spasm) for 2-3 days.
  – Carisoprodol 350 mg tid or qid; Cyclobenzaprine 10 mg tid.
• Injection of STEROID combined with LOCAL ANESTHETIC:
  a) epidural - may occasionally produce short-term pain relief in acute low back pain with radiculopathy.
  b) tender point - for myofascial or fibromyalgia syndrome.
  c) facet joints.
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  • Guidelines recommend that patients with chronic low back pain remain active!!!
• Treatment for back pain starts, ends, and restarts with back exercises! Medications are not as effective as exercises!

BACK EXERCISES
Tell patient to repeat each of following exercises two times day. Rotate from one exercise to other. Do one set of exercises and then rotate to another exercise and do set. Do not exercise past point of pain. Pain means stop!

1. Standing hamstring stretch: Place heel of your leg on stool or other object about 2 ft high. Keep your leg fully extended and lean forward. You will feel back of your leg begin to stretch (your hamstring muscles). Remember to keep leg straight and not bent and do not bend back. Hold stretch for 15 s. Repeat five times alternating with each leg.

2. Lying down hamstring stretch: Lie on your back and raise each leg straight (fully extended) until you feel same stretch in back of your leg. Bend your toes toward you to increase stretch. Hold stretch for 15 s. Repeat five times alternating with each leg.

3. Pelvic tilt: Lie on your back with your knees bent about 45° and feet flat on floor. Tighten your abdominal muscles and push your lower back into floor. Hold this position for 5 s. Do three sets of 10.
4. Partial curl: Lie on your back with your knees bent 45° and your feet on floor. Tighten your stomach muscles and flatten your back against floor. Place your chin onto your chest. Some individuals find that they need to support their neck with their hands clasped behind neck to decrease discomfort. Start curl by moving upper body toward your knees until your shoulders clear floor. Hold this position for 5 s. Exhale with curl and inhale as you return to starting position. Initially repeat 25 times and then build up to 50 at each setting.

5. Knee to chest stretch: Lie on your back with your legs straight out in front of you. Slowly bend one knee and bring it toward you. Clasp both hands around knee and pull it toward your chest. Hold this position for 15 s and return to starting position. Repeat process on other knee, then do both knees together. Repeat each one three times.

6. Sacroiliac joint stretch: Lie on your back with your knees bent to 45° and feet on floor. Place ankle of one leg on knee of other and gradually externally rotate that leg until you feel stretch in your back. Repeat with each leg and hold each external rotation for 15 s. Do each side 5 to 10 times.
Pelvic tilt (to flatten lumbar kydexs)
1. Lie on back with knees bent and heels on the ground.
2. Place the weight on the heels.
3. Lower the small of the back to touch the ground and roll the bottom of the pelvis upward about 0.5 inches from the ground.
4. Contract the belly muscles.
5. Hold this position for 10 sec and repeat 20 times. Perform this daily.

Back-strengthening exercises—Use a rowing machine.
Abdominal curls (to strengthen abdominal muscles)
1. Lie on the back with knees bent.
2. Put the hands across the abdomen.
3. While keeping the shoulders on the ground, slowly raise the head.
4. Slowly raise the shoulders 10 inches from the ground, and then slowly lower them.
5. Perform three sets of 10.
6. When this exercise becomes too easy, wrap a weight in a towel and hold it behind the neck. Increase the weight as strength improves.

Sitting trunk flexion (to stretch the lumbar spine)
1. Sit on the floor with knees straight and legs as far apart as possible.
2. Place both hands on the same knee.
3. Slowly move both hands down that leg, curved the ankle. Stop if it hurts, and go no farther than a position that can be held comfortably for 10 sec.
4. Slowly release and use the other leg. Repeat the exercise 10 times.

The swan (to improve lumbar flexibility)
1. Lie on the belly with elbows bent and hands touching the ears.
2. Raise the shoulders and legs from the ground at the same time. The knees should not be bent. If it hurts, stop the exercise immediately.
3. Hold this position for 10 sec and repeat 20 times. Perform this exercise daily.

Quad/hip-stretching exercises
Anterior hip stretch (to stretch the rectus femoris muscle)
1. Stand with one foot on the ground, and bend the knee of the other leg 90°.
2. Hold the front of the ankle of the bent leg in the same-sided hand.
3. Pull the ankle backward, while the knees are kept touching.
4. Hold for 10 sec.
5. Repeat for the other leg.
6. Repeat 10 times.

Single leg lifts (to stretch the hamstring and arch the lumbar spine)
1. Lie on the back with knees bent at 90° and both heels on the ground.
2. While keeping the knees bent, grab one knee in both hands and bring it to the chest.
3. Hold the knee in the chest for 10 sec; slowly lower that leg and repeat with the other leg.
4. Repeat 10 times.

STANDING
- have place to rest your foot that is 6 in. high; alternate each foot periodically.
- if working while standing, keep work surface near waist level.

LIFTING
- Push or slide heavy objects rather than lift them!
- stand as close as possible to item you will be lifting.
- place one foot slightly in front of other.
- bend your knees and squat down.
- lift object by pushing up with your legs and buttocks.
- when returning object to floor reverse procedure.

NECK PAIN
Always keep in mind the possibility of spondylarthropathies or of a severe process, such as tumor, trauma, infection, or rare vascular causes (e.g. vertebral artery dissection).

PATHOPHYSIOLOGY
- multifactorial

DISCO-genic pain
- cervical disc is dorsally innervated by a sinuvertebral nerve plexus and ventrally innervated by the cervical sympathetic trunk; disc degeneration may stimulate these nerves and generate mechanical pain.

FACET-generated pain
The distribution of pain elicited after stimulation of the facet joints in normal subjects:
DIFFERENTIAL

Mechanical neck pain is bilateral (vs. C3-4 radiculopathies – pain may be unilateral).

TREATMENT

SURGERY

Cervical spondylosis with primarily axial neck pain (without radicular symptoms or myelopathy) meeting all criteria:

1) failed to respond to extensive nonoperative treatment.
2) positive cervical discography (confirm a specific level as the pain source and, potentially, which levels to fuse) – only positive discs should be considered for surgical management, max. 1-2 discs.

1) MRI confirmation of spondylosis and no other causes.
2) cleared psychological testing.

• treatment of choice - ACDF (good results in appropriately chosen patients).

BIBLIOGRAPHY for ch. “Spinal Disorders” → follow this LINK >>