APPROACH TO BACK PAIN:

ALTHOUGH NON-SPECIFIC OR MECHANICAL BACK PAIN IS THE MOST COMMON CAUSE (>97% OF ACUTE CASES, I.E. <6 WEEKS), THE DIFFERENTIAL DIAGNOSIS INCLUDES SEVERAL LIFE-THREATENING AND DISABLING CONDITIONS

ABOUT 1% OF ALL PATIENTS HAVE TRUE SCIATICA

SEVERAL EMERGENT DIAGNOSES MUST BE EXCLUDED → A.A.A., DISSECTION, CAUDA EQUINA, EPIDURAL ABSCESS, OSTEOMYELITIS → VISCERAL CAUSES ~2% OF ALL ACUTE BACK PAIN

OF CANCER PATIENTS ~80% WHO PRESNT WITH BACK PAIN HAVE VERTEBRAL METASTASES → ESPECIALLY WITH BREAST, LUNG, PROSTATE, KIDNEY AND THYROID MALIGNANCIES

"THE RED FLAGS":

HISTORICAL FEATURES:

- Recent significant trauma or mild trauma over 50 years
- Prolonged steroid use
- Osteoporosis
- Age >70
- Back pain and syncope
- Acute onset of BACK, FLANK OR TESTICULAR PAIN
- Diaphoresis or nausea associated
- Cancer
- Low back pain worse at night or at rest
- Unexplained weight loss
- Recent bacterial infection
- Unexplained fever >38C
- IVDU
- Immunocompromised

PHYSICAL EXAMINATION:

- Abnormal vital signs → ↑HR, ↓BP, ↑ temp
- Unequal BP measures in upper limbs ???
- Pulse deficit or circulatory compromise in lower limbs
- Pulsatile abdominal mass
- Loss of rectal sphincter tone, urinary retention or focal lower limb weakness
- Focal back pain with fever

PATHOPHYSIOLOGY:

- Causes are diverse
- Annulus thins posterioly → most common site of nucleus pulposus herniation
    - Varies from bulging, to protrusion, extrusion to sequestration
    - 95% of herniations occur at L4-5, L5-S1, causing radicular pain in L5, S1 dermatomes

- SCIATICA → radiates below the knees, causing focal motor and sensory loss → worsens with bending, sitting, coughing, straining
    - S1 radiculopathy characterised by ↓ sensation of lateral small toes, impaired plantar flexion, ↓ankle jerk
- Disc bulging and anular tears with focal protrusion are COMMON in patients who are asymptomatic
    - Serial MRI show that two thirds of herniated discs regress or resolve over six months
- Compressive lesions ABOVE the cauda equina → UMN findings, below → LMN findings

DIAGNOSTIC APPROACH:

- First rule out life-threatening and disabling causes of back pain
- Let history and physical guide further investigation
- EMERGENT DIAGNOSES:
    - Aortic dissection/ruptured aneurysm
    - Cauda equina syndrome (bilateral leg pain, weakness, urinary retention with overflow incontinence, faecal incontinence, ↓d rectal tone, saddle anaesthesia)
    - Epidural abscess or haematoma
    - Meningitis
    - Spinal fracture or subluxation with cord or root impingement
- URGENT DIAGNOSES:
    - Back pain with neurologic deficits
    - Disk herniation causing neurologic compromise
    - Malignanct
    - Sciatica with motor nerve root compression
    - Spinal fractures without cord impingement
    - Spinal stenosis
    - Transverse myelitis
    - Vertebral osteomyelitis
- COMMON OR STABLE DIAGNOSES:
    - Acute ligamentous injury
    - Acute muscle strain
    - Ankylosing spondylitis
    - Degenerative joint disease
    - Intervertebral disk disease without impingement
    - Pathologic fracture without impingement
    - Seropositive arthritis
    - Spondylolisthesis
- REFERRED OR VISCERAL:
    - Cholecystitis
    - Oesophageal disease
    - Nephrolithiasis
    - Ovarian torsion, mass or tumour
    - Pancreatitis
    - Peptic ulcer disease
    - Pleural effusion
    - Pneumonia

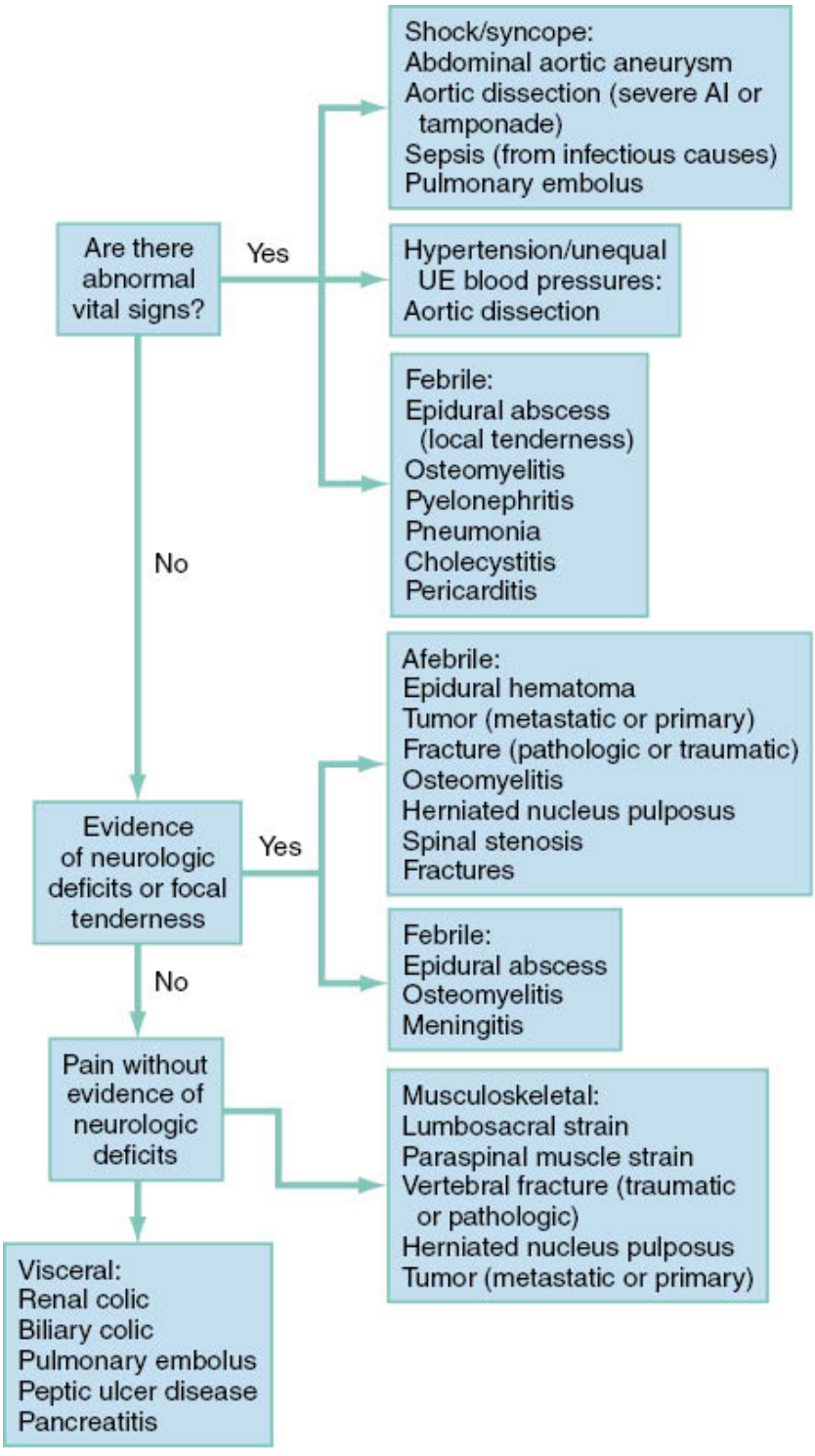
- PE
- Pyelonephritis
- Retroperitoneal haemorrhage or mass

PIVOTAL FINDINGS:

- **HISTORY:**
  - Where is the pain? → radicular pain, extending below the knee in a dermatomal distribution implies nerve root involvement, whereas pain in a the paralumbar musculature without dermatomal radiculopathy implies non-specific back pain
  - When did the pain start? → acute onset with specific task suggests mechanical back pain. If sudden/severe → think more sinister causes. Insidious onset not related to activity → think malignancy
  - Aggravating/alleviating factors → tumours/infection → NIGHTTIME PAIN, persistent pain unrelieved by rest/analgesia. Spinal stenosis → relieved by flexion, aggravated by ambulation (esp downhill)
  - Is there motor or sensory loss, bowel/bladder dysfunction → progressive or severe neurologic symptoms → MRI/CT emergently
  - Other pertinent history → fever, medications, steroids, haematuria, possibility for secondary gain (workplace/compensation pending)
  - PMHx→ cancer, inflammatory disease, IVDU (discitis), medications (anticoagulants ↑ epidural abscess), osteoporosis, sickle cell disease, atherosclerosis → AAA/dissection
- **PHYSICAL EXAMINATION:**
  - Vital signs → obviously
  - Lower back inspection:
    - Observe gait/movement
    - Assess ROM, extension may aggravate facet pathology or nerve root impingement
  - Neurological examination:
    - Asymmetrical reflexes
    - Dermatomal sensory loss
    - Focal muscle weakness
    - Heel-walking and toe-walking indicate normal plantar/dorsiflexion respectively
    - Presence of clonus, hyper-reflexia or upgoing plantars indicate an UMN lesion
    - Rectal exam → sphincter tone/anal wink, test perianal sensation
  - STRAIGHT LEG RAISE:
    - Classic test for sciatic nerve root irritationf
    - Sensitive BUT NOT specific for nerve root disease
    - Positive result is pain radiating down the leg below the knee in a dermatomal distribution when the leg is elevated to less than 90 degrees
    - Pain referred to an affected leg with straight-leg raise of the unaffected leg is insensitive but HIGHLY SPECIFIC for nerve root irritation → CROSS-OVER PAIN
- **ANCILLARY TESTING:**
  - Laboratory testing:

        - For mechanical causes → LITTLE VALUE
        - If inflammatory disease suspected → ESR/FBC helpful but rarely useful in ED
    - IMAGING:
        - Patient satisfaction is reportedly improved when imaging is performed, BUT PLAIN RADIOGRAPHS ARE NOT USEFUL IN UNCOMPLICATED MECHANICAL LOW BACK PAIN OF LESS THAN 6 WEEKS' DURATION
        - Do not perform if advanced imaging is planned (CT/MRI)
        - Consider plain films if → significant trauma, cancer, focal deficit, unexplained weight loss, night/rest pain, prolonged steroid use, fever
        - MRI > CT > myelogram → indicated if an acute, significant neurological deficit such as motor loss or cauda equina syndrome is present
            - For those with acute back and radicular pain without motor weakness or those with chronic back pain without neurologic deficit, obtaining MRI/CT DOES NOT IMPROVE OUTCOME
        - If infection/tumour suspected → MRI is test of choice

RAPID ASSESSMENT OF ACUTE BACK PAIN



CLASSIC FINDINGS OF SELECTED SERIOUS CAUSES OF BACK PAIN

Table 28-1 Classic Findings in Selected Serious Causes of Acute Back Pain

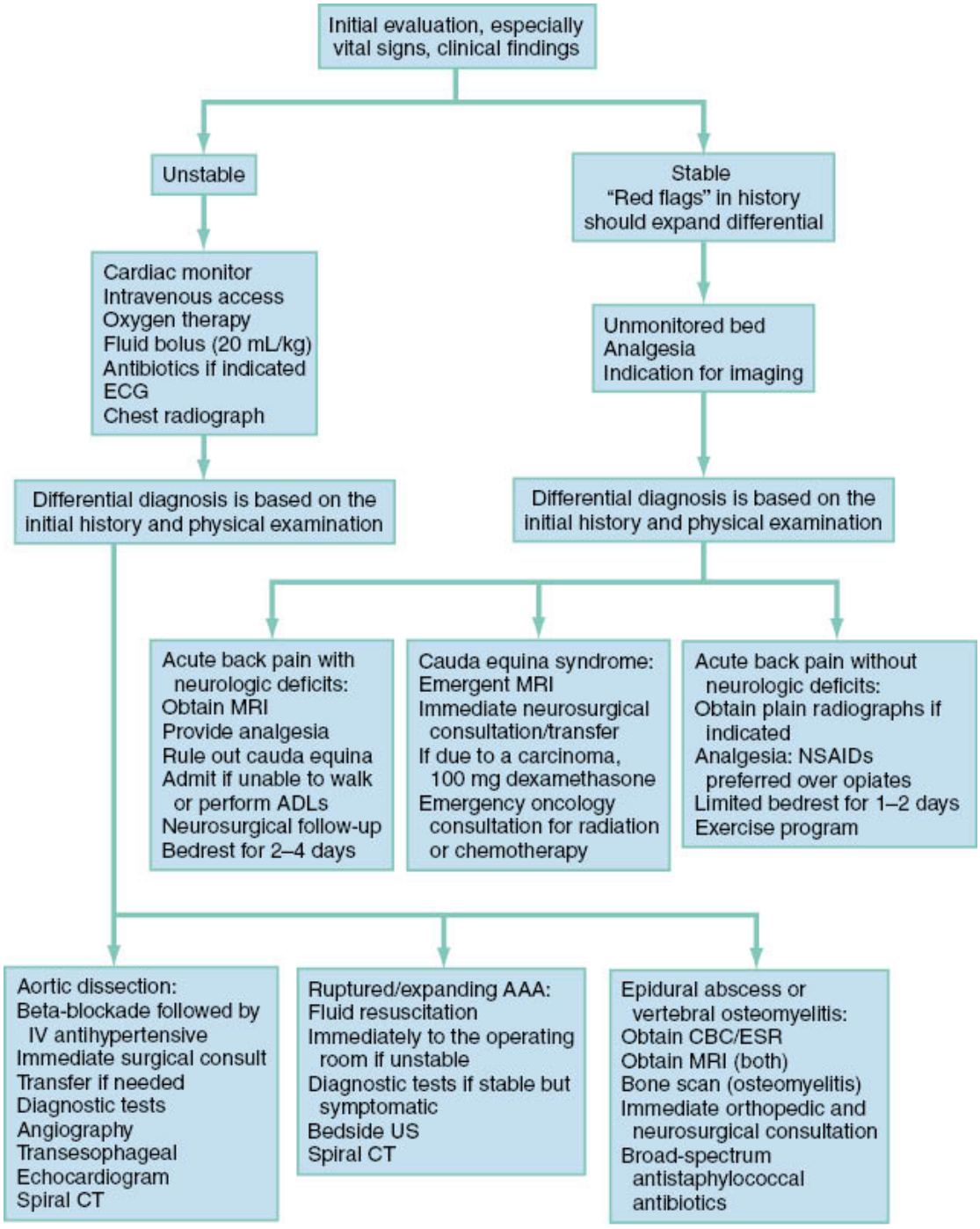
	DIAGNOSES	HISTORY	IMPORTANT PHYSICAL EXAMINATION FINDINGS	ANCILLARY TESTING	COMMENTS
Critical					
Vascular	Aortic dissection	Often sudden-onset, "tearing" severe pain. Associated nausea, vomiting, acute anxiety are common. Syncope can occur	Associated diaphoresis, unstable vital signs. Hypertension is common. Unequal upper extremity blood pressure. New-onset aortic insufficiency murmur. Central and peripheral neurologic deficits secondary to ischemia	Choice of CT, MRI, aortogram depends on patient stability and availability of equipment	More common as a chest pain cause, but low back pain may be only complaint
	Abdominal aortic aneurysm (ruptured/ expanding)	Pain may radiate to back, flank, or testicle. Patient may present with syncope	Pulsatile abdominal mass (especially if right of midline), abdominal bruits. Diminished lower extremity pulses or hypoperfusion or both	Bedside US. If "stable," abdominal CT with contrast. Plain films may show a calcified enlarged aortic contour	Can also mimic renal colic, GI bleeding, diverticulitis, and myocardial infarction. 30% of signs are misdiagnosed
Infectious	Spinal epidural abscess	At-risk population with diabetes, chronic renal failure, intravenous drug use, alcoholism, cancer, or recent spinal surgery or trauma. Sepsis-linked history is common	Fever, reproducible radicular pain, other signs of sepsis. Localized body tenderness along spine Focal neurologic deficits are late findings (<50% patients). Rare cauda equina–like syndrome	CBC, blood cultures useful but nonspecific. MRI modality of choice. CT or myelography can be used. Search for source of infection. *Staphylococcus aureus* common cause (70%)	Presents as mass-occupying lesion compressing spinal cord; may be hematoma, malignancy, disk. Often begins as focal pyogenic infection in disk. Biopsy may be necessary

Table 28-1 Classic Findings in Selected Serious Causes of Acute Back Pain—cont'd

	DIAGNOSES	HISTORY	IMPORTANT PHYSICAL EXAMINATION FINDINGS	ANCILLARY TESTING	COMMENTS
Mechanical	Cauda equina syndrome	Usually a history of back pain. Symptoms may develop over hours	Urinary retention and fecal incontinence. Saddle anesthesia, bilateral leg pain. Lower extremity weakness with hypo-reflexia	CT with or without contrast, MRI useful	Can result in severe dysfunction. An emergent condition caused by compression of lumbosacral nerve roots
	Spinal fracture with cord impingement	Acute onset, localized pain. Usually trauma history. Older population with osteoporosis also at risk	Bone tenderness, radicular, or cord compression findings	Plain films initially, then CT or MRI	Symptoms/signs depend on level
	Epidural hematoma	Usually patient with coagulation disorder, hereditary or acquired (e.g., anticoagulants). May occur after epidural anesthesia	Radicular findings (neurologic defects). Neurologic pattern similar to abscess	MRI, CT, or myelography	Can also occur in AV malformations
Emergent					
Infectious	Vertebral osteomyelitis	At-risk group similar to that for epidural abscess. Onset may be insidious. Back pain, tenderness, and stiffness may precede neurologic findings by significant time period	Fever and other constitutional symptoms. Localized body tenderness of two adjacent vertebrae	CBC, blood cultures generally low yield. Plain films diagnostic 80–95%, but MRI more accurate and detailed	Biopsy may be necessary for diagnosis. *S. aureus* most common
Immune	Transverse myelitis	Back pain and neurologic deficits. Almost 50% of patients worsen maximally in 24 hr	Partial/total loss sensory, motor, autonomic, and sphincter function below the level of the lesion. Leg weakness more common; arm involvement is rare. Bladder (bowel control) involved in most patients	Goal is to rule out mass lesion compressing the cord. Thought to be autoimmune origin. MRI is imaging modality of choice. Contrast CT and CT myelogram may be obtained	May be associated with multiple sclerosis, SLE, sarcoidosis. Also associated with Lyme disease. Epstein-Barr virus, and other viral (herpes, enterovirus) or bacterial (tuberculosis syphilis) infections
Mechanical	Back pain with neurologic deficits Intervertebral disk herniation Spinal stenosis Spinal fractures without cord impingement Malignancy Sciatica with potential of nerve root compression	Most patients recall atraumatic mechanisms (lifting, twisting). Common complaints are stiffness, tenderness, decreased range of motion	Positive straight leg raise test. Muscular weakness. Potential for sensory deficits. Absent or diminished deep tendon reflexes	Selective use of plain films. CT or MRI performed for complete assessment when "red flag" present	Search for "red flags" (see Box 28-1) to rule out serious underlying disease

AV, arteriovenous; CBC, complete blood count; CT, computed tomography; GI, gastrointestinal; MRI, magnetic resonance imaging; SLE, systemic lupus erythematosus.

EMPIRICAL MANAGEMENT:



- For a stable patient, early effective pain management can be of significant value
    - Physicians NOTORIOUSLY UNDERESTIMATE AND UNDERTREAT PAIN
        - Mix of IV opioids, NSAIDs, paracetamol