



Assessing Back Pain in Patients Presenting to the ED

Red flags can alert nurses to serious underlying conditions.

ABSTRACT: Although back pain is common, most often benign, and generally resolves in a few days with self-care, nonspecific low back pain that does not resolve with self-care and prompts patients to seek treatment in an ED may result from a serious underlying pathology. In this article, the first in a series on clinical red flags—indicators that can be used in the clinical setting to screen for an elevated risk of severe underlying conditions—the author considers back pain manifestations that may signal the presence of a debilitating or even fatal disease process. Detecting such red flags and communicating their presence to the attending provider can facilitate appropriate diagnosis and management.

Keywords: assessment, back pain, low back pain, red flags for back pain

Elaine Hunt is a 64-year-old postmenopausal woman who presents to the ED for severe, unremitting lumbar pain that began two weeks ago. (This case is a composite based on my experience.) She reports neither trauma nor injury but notes that her back pain developed when she'd been hiking on the Appalachian Trail. To enable her to complete her trip, her physician prescribed acetaminophen and lidocaine patches, and advised her to avoid nonsteroidal antiinflammatory drugs, since she was taking prednisone for chronic obstructive pulmonary disease. The pain, however, has progressed despite continued use of the patches.

Ms. Hunt says she's had no fever associated with the pain but notes that she has lost about 20 lbs. in the past four months without dieting. The back pain is worse in the daytime with movement, but it has disturbed her sleep as well. When asked about any weakness or numbness, she says the top of her right foot feels "dull," and she worries that it might give out when she walks. She says she has had neither bowel nor bladder incontinence.

Using a 0 (no contraction) to 5 (normal) scale to grade motor strength, the nurse assesses weakness in dorsiflexion and plantar flexion of Ms. Hunt's right foot (4/5) in comparison with her left (5/5) and notes poor sharp versus dull discrimination of the right foot over the first four metatarsals.

After completing triage, the nurse discusses these findings with the attending provider. Since Ms. Hunt's vital signs are normal and she has no fever, her nonspecific low back pain may be related to her recent activity. However, Ms. Hunt's age and postmenopausal status, which increase the risk of osteoporosis, in addition to her steroid use, which increases the risk of compression fracture, raise concerns of nerve root compression. Imaging in the ED reveals compression fractures at L1 and L2 with disk bulging and nerve root impingement (see Figure 1). Neurosurgery is consulted, and Ms. Hunt is admitted for definitive care.

WHEN BACK PAIN SIGNALS A SERIOUS HEALTH PROBLEM

Back pain is one of the most common reasons people seek medical help or miss work. Although

acute nontraumatic back pain is often benign and resolves without medical intervention,^{1,2} a systematic review of 19 studies conducted in 12 countries between 2000 and 2016 found that reported prevalence of low back pain in the emergency setting ranged from 0.9% to 17%, and both Canadian and U.S. research indicates that low back pain is among the top five reasons patients present to the ED.³ Moreover, nonspecific low back pain that prompts patients to seek treatment in an ED has been found to be more likely than back pain seen in primary care settings to result from serious underlying pathologies,⁴ which may include the following potentially debilitating or fatal conditions^{2,5}:

- leaking aortic aneurysm
- infectious processes, including epidural abscess, vertebral osteomyelitis, and infectious diskitis
- compression fracture
- spondyloarthropathy
- malignancy
- cauda equina syndrome (CES), which is nerve root compression that disrupts motor and sensory function in the lower extremities and bladder
- gastrointestinal or retroperitoneal emergencies
- radiculopathy
- spinal canal stenosis

These findings support the need for heightened awareness of what are known in health care settings as red flags; that is, signs, symptoms, and historical indicators that may signal the presence of a serious underlying disease.⁴ Such markers represent time-sensitive conditions, which, if missed during triage, could lead to catastrophic outcomes.

THE IMPORTANCE OF RED FLAGS IN TRIAGING BACK PAIN

Emergency nurses performing triage play a critical role in identifying red flags and recognizing patients whose back pain may be associated with serious conditions.

The moment the patient enters the ED, nursing documentation of abnormal vital signs, atypical neurologic findings, reports of new neurologic deficits, observations such as a patient's difficulty walking, and the patient's subsequent triage level assignment and placement in the ED (for example, in a fast-track versus an acute treatment area) can have an enormous impact on the course of care. This article discusses red flags that can be used to identify serious medical conditions in patients who seek emergency care for back pain, with a focus on those that may signal conditions directly affecting the spine and neurologic system.

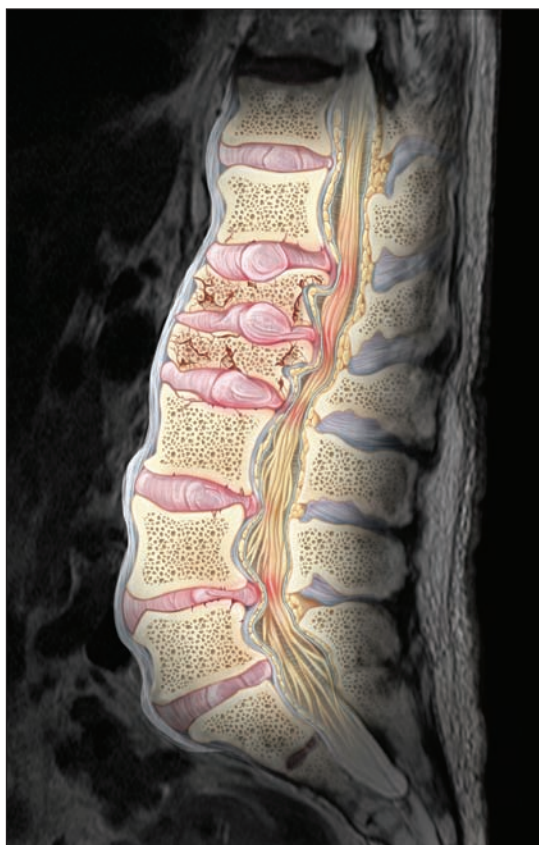


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Figure 1. Compression fractures at L1 and L2.

RECOMMENDED TRIAGE SYSTEMS

Based on expert consensus, the American College of Emergency Physicians and the Emergency Nurses Association recommend that EDs use a standardized, five-level triage system that has been established as reliable and valid, such as the Emergency Severity Index (ESI), which categorizes patients into one of five triage groups, from level 1 (most urgent) to level 5 (least urgent), based on acuity and resource needs, or the Canadian Triage and Acuity Scale.⁶ A 2009 survey of U.S. hospitals found that more than 70% of large hospitals and teaching hospitals reported using the ESI, and though small hospitals commonly used three-level systems, more than 72% of ED visits were triaged using the ESI.⁷ In identifying, documenting, and communicating to the care team the presence of red flags, nurses increase the likelihood that patients will receive the correct triage categorization, diagnosis, and treatment.

BACK PAIN TERMINOLOGY AS COMMONLY USED

While thoracic back pain is prevalent in the general population, the lumbar and cervical spine are the

regions of the back most often studied, as they are strongly associated with pain, injury, and degenerative conditions.⁸

A modified Delphi study sought to identify standardized definitions of low back pain, based on the input of 28 experts in back pain research who hailed from 12 countries. The majority (82%) of these experts interpreted back pain as low back pain, not inclusive of cervical or thoracic pain.⁹ For nurses, this means that recommendations or guidelines for back pain generally refer to lumbar pain, unless otherwise specified.

- current anticoagulant use
- new urinary retention
- low hemoglobin values (less than 10 to 11 g/dL)

RED FLAGS FOR BACK PAIN IN NONEMERGENCY SETTINGS

A systematic review that evaluated 53 red flags for potential fracture or malignancy in 14 studies of patients presenting with low back pain to primary, secondary, or tertiary care, found that patients' risk of fracture in these settings was increased by 10% to 33% if any of the following factors were present, or by 42% to 90% if multiple factors were present¹⁰:

For patients whose chronic back pain has changed, ask about alterations in the pain's quality, onset, or duration, and what prompted their visit to the ED.

The use of red flags can provide valuable information, but it's important to know which indicators have demonstrated sensitivity and reliability in specific health care settings and to recognize that the absence of red flags does not exclude significant pathology. A thorough patient history and physical assessment are the most reliable means of detecting the presence of risk.

RED FLAGS FOR BACK PAIN IN THE ED

A 2020 systematic review of 22 studies that included a total of 41,320 patients presenting to an ED with low back pain evaluated the accuracy of several red flags as potential markers of serious pathologies associated with low back pain and found a "very good" diagnostic accuracy for the following red flags⁴:

- history or suspicion of cancer (for spinal cancer)
- IV drug use (for epidural abscess)
- indwelling vascular catheter (for epidural abscess)
- other infection site (for epidural abscess)
- bladder or suprapubic fullness on physical examination (for any serious outcome)
- anemia (for any serious outcome)
- history of trauma with positive neurologic signs (for vertebral fracture)

A "good" or "very good" accuracy in predicting serious outcomes was found for the following red flags:

- advanced age
- prolonged steroid use
- severe trauma
- contusion or abrasion

History of cancer carried an increased malignancy risk of 7% to 33%, whereas the following factors were associated with a 3% risk of malignancy¹⁰:

- advanced age
- unexplained weight loss
- failure to improve after a month

An analysis of 46 red flags endorsed in 16 current guidelines for identifying malignancy, fracture, infection, or CES in patients presenting to primary care with low back pain found little consensus among the guidelines in the red flags endorsed and scant evidence for the accuracy of recommendations, though there was agreement on red flags for malignancy and fracture.¹¹ Nearly all of the guidelines endorsed history of cancer and unintentional weight loss as red flags for malignancy, and major or significant trauma and use of steroids or immunosuppressors as red flags for fracture in this setting. It's important to keep in mind, however, that findings concerning the utility of red flags in nonemergency care settings may not be applicable in an ED.

KEY COMPONENTS OF THE PATIENT HISTORY

It's important to ask any patient with new traumatic back pain about the mechanism of injury. For patients whose chronic back pain has

Table 1. Red Flag Indicators in Patients with Back Pain^{2, 5, 10, 13-19}

Findings in Patient History	Possible Pathologies
Trauma	Fracture, infection, epidural hematoma
Disk herniation, spondylosis, scoliosis, hypoxia, tumor, vertebral fracture	Mediastinal nerve root compression or impingement, fracture, restrictive lung disease
Fever, chills, night sweats, diabetes mellitus, alcoholism, iv drug use (at any point in life), compromised immunity, trauma (including spinal surgery), neurologic deficits	Infectious processes, including epidural abscess, vertebral osteomyelitis, and infectious diskitis; cancer
iv drug use (at any point in life)	Infectious endocarditis
Anticoagulant therapy, coagulopathies, recent epidural catheterization	Epidural hematoma
Immunosuppressive therapy, chemotherapy, antirejection drugs, steroids	Infection, cancer
Unintended weight loss, history of cancer	Spinal cancer or metastasis
Radiculopathy, motor weakness, loss of sensation (including saddle anesthesia), urinary or bowel retention or incontinence	Cauda equina syndrome, infection, metastases

changed, ask about alterations in the pain's quality, onset, or duration, and what prompted their visit to the ED. Ask if they're experiencing new symptoms, such as a sudden change in the severity of chronic pain, or the development of systemic symptoms, such as fever, chills, night sweats, or unintentional weight loss, and if they have any new motor weakness or numbness. Red flags would include the presence of saddle anesthesia (the loss of sensation to the areas of the body that would sit on a saddle), and bowel or bladder changes, such as urinary retention or incontinence.¹² (See Table 1^{2, 5, 10, 13-19} for other red flags the patient history may reveal.)

Investigate any pattern of symptoms related to back pain, such as motor weakness, altered sensation, or radiation of pain into the extremities (radiculopathy), as such patterns often reveal the dermatome, or location along the spine, in which the injury originates. Findings may represent spinal cord ischemia due to CES.¹² Developmental and chronic conditions, such as scoliosis, spondylitis, or facet disease, do not generally require urgent intervention. However, acute or significant changes in the character of chronic lumbar radicular pain may indicate infectious or neoplastic conditions that warrant further investigation.¹⁵

Document patients' medical and surgical history and conduct a medication reconciliation, noting any medications that might raise the risk of infection or fracture. A 2011 chart review found that 6% of patients presenting to the ED for nontraumatic vertebral fractures were misdiagnosed, increasing the risk of spinal cord compression and permanent disability.¹⁶ Both an age

over 50 and use of corticosteroids raise the risk of nontraumatic fracture.

PHYSICAL ASSESSMENT

In patients admitted for back pain, nurses should inspect posture and spinal alignment, starting by observing the patient enter the ED. Difficulty walking can be an indicator of neurologic compromise and should be further assessed in a timely manner.¹⁶ Note any indications of trauma, including ecchymosis or abrasions; the patient's overall demeanor; any difficulty with gait or weight bearing on either side, and specific positions in which the patient finds relief or aggravation of pain.

Following major trauma, the patient may be in spinal stabilization on a backboard. Nurses should collaborate with a medical provider to clear and remove the backboard as soon as possible before initiating the physical assessment.²⁰ Ensure that adequate personnel are on hand to safely logroll the patient and determine whether there is any step-off (visible or palpable malalignment) of the midline spine or paraspinal structures.²¹

Palpation should be systematic, moving from the midline spinal column to the paraspinal areas on each side and then to the periphery of the back, isolating areas of tenderness, especially along the midspine, which can indicate the presence of lesions, including fracture, neoplasm, or infection. Correlate neurologic findings with a dermatomal level.

Nursing documentation should include findings from the patient history and the physical assessment, both those that support and those that do not support the presence of red flags. Any red flags or

concerns should be communicated to members of the emergency care team. ▼

For three additional nursing continuing professional development activities on the topic of back pain, go to www.nursingcenter.com.

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