

## How can physicians decide if low-back pain has a serious cause?

Low-back pain is a common symptom and there are many possible causes. In primary care, low-back pain can be classified into one of four categories: a problem beyond the lumbar spine (e.g., kidney stones); a serious disorder affecting the lumbar spine (e.g., epidural abscess); low-back pain occurring with radicular pain (e.g., related to intervertebral disc herniation) or neurogenic claudication (e.g., related to central spinal canal stenosis); or nonspecific low-back pain.<sup>16</sup> Nonspecific low-back pain — where a specific pathoanatomic diagnosis is not possible — accounts for about 90% of all low-back pain seen in primary care.<sup>17</sup> The primary purpose of this initial classification is to identify the small number of patients with low-back pain who require specific treatments or urgent referral to a specialist to avoid serious consequences. In a longitudinal cohort study in primary care settings in Australia ( $n = 1172$ ), less than 1% of patients were found to have a serious cause for their low-back pain (e.g., cancer, infection or fracture).<sup>18</sup>

A focused history and physical examination is used to identify those with a greater likelihood of serious disease or a specific cause of low-back pain (Box 2). All other cases are considered to be nonspecific low-back pain.

## Is it always necessary to determine a cause?

Many physicians dismiss a diagnosis of nonspecific low-back pain<sup>23</sup> and instead pursue specific diagnoses of the anatomic structures responsible for the pain.<sup>24</sup> There are two problems with this approach. First, the tests used to identify anatomic sources of nonspecific low-back pain have unacceptably low validity,<sup>25</sup> so the diagnoses are nominal. For example, the clinical utility of describing patients as having “neuropathic” back pain has not been established; screening questionnaires used to detect this condition have unclear evidence for validity,<sup>26</sup> and there is evidence that drugs for neuropathic pain lack clinical effectiveness. One recent high-quality randomized controlled trial (RCT) involving patients with sciatica ( $n = 209$ ) in Australia reported that pregabalin, a drug for neuropathic pain, was not effective for either acute or chronic radicular pain compared with placebo.<sup>27</sup> Second, structural diagnoses encourage the use of structure-based treatments that have been shown to be ineffective. Despite evidence of their ineffectiveness, treatment with injections of anesthetics, corticosteroids, sclerosing agents, stem cells and blood products into back structures that are thought to be generating the pain waste billions of dollars each year. For example, almost 1 million lumbar facet injections were funded by the Centers for Medicare and Medicaid Services in the US in 2011.<sup>28</sup>

## Which patients require diagnostic imaging?

Most patients who complain of low-back pain do not require diagnostic imaging immediately. Imaging is only indicated if a specific cause of low-back pain is suspected and timely diagnosis

is critical to safe effective care.<sup>29</sup> If there is low suspicion of cancer or fracture, it may be reasonable to defer testing and start a trial of treatment. However, if there is any level of suspicion of cauda equina syndrome or an epidural abscess, immediate investigation is warranted given the serious consequences of delayed diagnosis.<sup>29</sup> Contrary to common practice, patients with radicular pain or radiculopathy related to suspected disc herniation or neurogenic claudication related to suspected central spinal canal stenosis, do not need to be referred for immediate imaging, because the results will not change primary care management; the initial management of these conditions and nonspecific low-back pain are the same (Figure 1).

Some clinical guidelines encourage diagnostic imaging when one red flag is present (i.e., an alerting feature such as night pain).<sup>30</sup> Although serious disease is uncommon, red flags may be common; therefore, this approach is unwise. For example, in a

### Box 2: Alerting clinical features for specific causes of low-back pain\*

#### Serious spinal disease

- New bladder or bowel disturbance, saddle numbness, lower motor neuron weakness (consider cauda equina syndrome†)
- New onset of fever and history of intravenous drug use, spinal procedure, immunosuppression (consider vertebral infection†)
- History of cancer that metastasizes to bone (e.g., breast, lung, prostate) (consider metastatic disease)
- History of osteoporosis, systemic steroid use, trauma, older age (more than 65 years of age) (consider vertebral fracture if multiple features present)<sup>19</sup>
- Persistent symptoms (more than 12 weeks), age at onset is less than 45 years, inflammatory features (insidious onset, no improvement with rest, pain at night and/or early morning that improves with exercise or activity), peripheral manifestations (e.g., arthritis, enthesitis, uveitis, psoriasis) or family history of spondyloarthritis (consider axial spondyloarthritis)<sup>20</sup>

#### Problem beyond the spine

- Systemically unwell
- Nonmechanical pain (i.e., pain that is unrelated to movement)
- Hip joint signs (consider hip joint disease)
- Abdominal pulsations (consider abdominal aortic aneurysm)<sup>21</sup>
- Gynecologic, renal/urinary tract, gastrointestinal signs and symptoms (e.g., abdominal tenderness, hematuria) (consider visceral origin)
- Atherosclerotic risk factors, claudication (consider vascular origin)

#### Radicular pain or neurogenic claudication

- Leg pain in a spinal nerve distribution with or without low-back pain (consider radicular pain†)
- Sensory loss, reduced reflex, myotomal weakness in spinal nerve distribution (consider radiculopathy†)
- Bilateral buttock, thigh or leg pain, pseudoclaudication (consider central spinal canal stenosis† (e.g., age-related degenerative changes including degenerative spondylolisthesis)

\*Adapted from the article by Atlas and Deyo.<sup>22</sup>

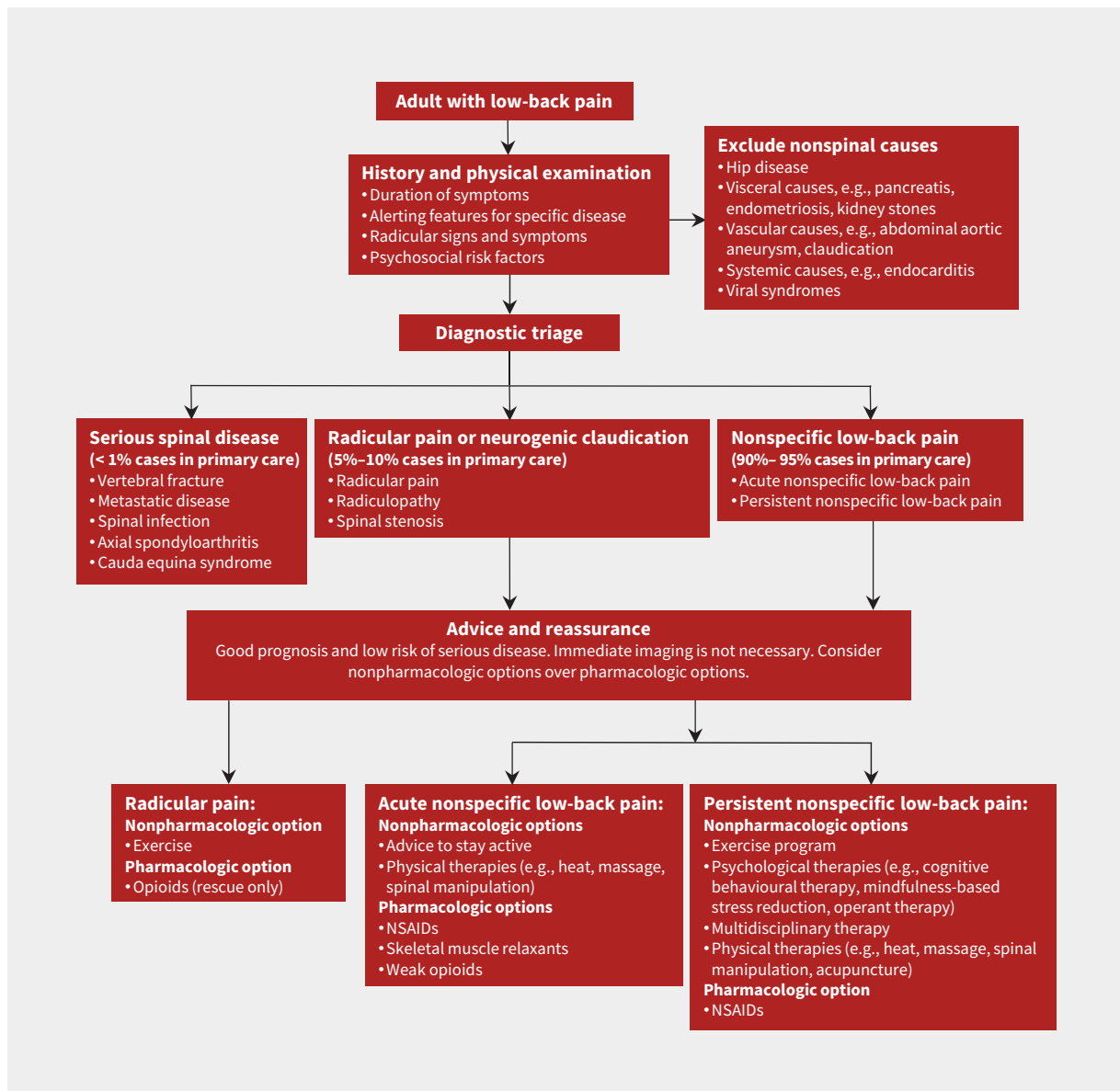
†These patients may not have low-back pain. Suspicion of cauda equina syndrome or vertebral infection requires urgent referral to a specialist.

prospective longitudinal study involving 482 consecutive patients who attended a back pain triage clinic, 213 (44%) reported night pain, yet none of these patients had serious disease.<sup>31</sup> In an Australian cohort of 1172 patients,<sup>18</sup> where less than 1% of patients had a serious cause of the low-back pain, 80% had at least one red flag. This means that most red flags will be false positives. A Cochrane review of 24 red flags for malignant disease<sup>32</sup> found only one (previous history of cancer) that had acceptable diagnostic accuracy in patients with low-back pain. Decisions about further diagnostic work-up should be based on consideration of a combination of clinical features, the strength of clinical suspicion and the consequences of a delayed diagnosis. Clinical decision aids to support screening for serious disease have been developed;<sup>33</sup> however, these have not been evaluated in diagnostic studies. Many patients expect diagnostic imaging,<sup>34</sup> and a clear explanation for not ordering immediate imaging

should be provided. We have presented an example dialogue in Appendix 1 (available at [www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.170527/-/DC1](http://www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.170527/-/DC1)).

### How should acute low-back pain be managed?

Two recent changes to guidelines for acute low-back pain are important. First, nondrug options are preferred over pharmacologic pain relief for initial management of back pain.<sup>14,15</sup> Second, a stratified approach to management based on scores from prognostic screening questionnaires rather than on response to initial management is recommended in the UK guideline.<sup>14</sup> Guideline-congruent management of acute low-back pain is summarized in Table 1. Key changes to management of low-back pain over the past 10 years are summarized in Appendix 2 (available at [www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.170527/-/DC1](http://www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.170527/-/DC1)).



**Figure 1:** Diagnosis and management of low-back pain according to current clinical practice guidelines from the United Kingdom and United States.<sup>14,15</sup> NSAID = nonsteroidal anti-inflammatory drug.