

# Epidural Steroid Injections for Radicular Lumbosacral Pain: A Systematic Review

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## KEYWORDS

• Epidural injection • Steroids • Lumbosacral radicular syndrome • Low back pain

## KEY POINTS

- A systematic review of the literature suggests that off-label epidural steroid injections provide short-term but not long-term (>12 weeks) relief of leg pain and improvement in function in patients with benign lumbosacral radicular syndrome. The clinical importance of steroid benefits is small (<10 points improvement on a 100-point scale).
- Different steroids are similarly effective in reducing pain and disability in the short term but do not do so in a dose-responsive manner.
- Injection of steroids is no more effective than injection of local anesthetics alone.
- Postprocedural complications are uncommon, but the risk of contamination and serious infections is very high.
- Evidence is insufficient to posit an association between short-term effectiveness of steroid injections and differing patient characteristics.
- Based on high-quality evidence, routine use of off-label epidural steroid injections in adults with benign radicular lumbosacral pain is not recommended.

## INTRODUCTION

The prevalence of acute and chronic low back pain in adults has increased more than 100% in the last decade and continues to increase dramatically in the aging population, affecting both men and women in all ethnic groups.<sup>1</sup> Low back pain contributes to

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lost productivity, disability, and substantial health care expenditures,<sup>2</sup> and is the leading determinant of years lived with disability.<sup>3</sup>

The goals of conservative treatment of chronic low back pain (pain persisting for >12 weeks)<sup>4</sup> are to decrease pain, improve function, reduce opioid use, and obviate spinal surgery.<sup>5</sup> Most available clinical guidelines do not recommend routine use of invasive treatments, including epidural steroid injections, for the management of chronic low back pain.<sup>6</sup>

However, many clinicians do not adhere to these guidelines.<sup>7</sup> The Office of Inspector General (OIG) of the United States Department of Health and Human Services concluded that more than 30% of epidural injections were inappropriate, and resulted in \$45 million of improper Medicare payments, and an additional \$23 million in improper facility payments.<sup>8</sup> Lack of adherence to guideline recommendations among generalist physicians may relate to difficulties in communicating to patients the benefits and harms of available treatments for low back pain.<sup>9</sup>

Many studies, including systematic reviews,<sup>10–16</sup> suffer from inconsistent methodology and provide conflicting conclusions and recommendations about the benefits and harms of epidural treatments, making clinical decisions even more difficult. Individual randomized studies<sup>17–29</sup> use various definitions of low back pain, evaluate different steroid administration routes and doses, and provide inconsistent measures of treatment success. Therefore, this article aims to provide a comprehensive overview of currently available reviews and primary epidemiologic studies to inform evidence-based clinical decision making in the treatment of benign chronic low back pain.

## METHODS

The authors formulated the following clinical questions as the basis for this overview. (1) What are the short-term and the long-term efficacy and safety of epidural steroid injections in the treatment of chronic radicular lumbosacral pain in community-dwelling adults? (2) What patient characteristics may modify treatment benefits and harms?

The target population was defined as community-dwelling adults age 18 and older with benign radicular lumbosacral pain lasting more than 12 weeks.<sup>4,30</sup> Lumbosacral radicular syndrome was defined as radiculopathy, nerve root compromise, nerve root compression, disc herniation, radiculitis, nerve root pain, or nerve root entrapment.<sup>31,32</sup> This review relied on diagnostic methods provided by the authors of the original studies. It was determined whether the following factors modified the effects of treatment: patient age, gender, ethnicity, socioeconomic status, duration of pain, and prior response to analgesics; and comorbidities including obesity, osteoporosis, and history of spinal trauma, diabetes, or arterial hypertension.

Eligible interventions included off-label epidural steroid injections administered with or without fluoroscopic guidance. The effects of different routes of steroid administration (eg, caudal, transforaminal, or interlaminar) and different steroid formulations and doses (Appendix 1 Tables 1 and 2; available at [www.pmr.theclinics.com](http://www.pmr.theclinics.com)) were examined as well as the frequency of injections if provided by the investigators. Comparators included placebo, epidural injection of anesthetics, and nonpharmacologic treatments including physical therapy or acupuncture/acupressure.

Outcomes included pain, global symptom relief, functional improvement and reduction in disability, patient perception of improvement, return to work, use of opioid and nonopioid analgesia, need for surgery, and quality of life. Outcomes at both short-term

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