

# Medicine by the Numbers

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## Corticosteroids for Low Back Pain

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### Details for This Review

**Study Population:** Adults 18 years or older with acute or chronic low back pain in one of three diagnostic groups: radicular low back pain, non-radicular low back pain, or spinal stenosis

**Efficacy End Points:** Improvement in pain and function, need for surgery, and quality of life

**Harm End Points:** Adverse events, serious adverse events, transient hyperglycemia, and withdrawal from the trial

**Narrative:** Acute low back pain is a common reason adults present to primary care. Low back pain is usually self-limited; however, 31% of people with low back pain do not fully recover within six months.<sup>1</sup> Physicians often use corticosteroids to treat acute low back pain with and without radicular symptoms, but the benefits and harms are unclear. Corticosteroids, when used orally, intramuscularly, or intravenously, or when injected directly into spinal structures, theoretically work to mitigate symptoms of low back pain through their anti-inflammatory properties. The 2017 American College of Physicians guideline did not include a recommendation for the use of systemic corticosteroids for low back pain.<sup>2</sup>

This Cochrane review examined the utility of systemic corticosteroid administration in patients with low back pain.<sup>3</sup> The review identified 13 studies (n = 1,047) that evaluated the effectiveness of systemic corticosteroids in the treatment of low back pain with radicular symptoms (nine studies), low back pain without radicular symptoms (two studies), and spinal stenosis (two studies). Nine of the studies were randomized controlled trials conducted in the United States (six trials), Australia (one trial), Brazil (one trial), and Iran (one trial). The studies included patients from primary care settings, specialty clinics, or emergency departments and compared corticosteroids vs. placebo. Corticosteroid options (prednisone, prednisolone, methylprednisolone, dexamethasone, betamethasone, hydrocortisone) and dosing regimens varied. Studies of back pain

### THE NUMBERS

#### Benefits

1 in 6 with radicular low back pain was helped: short-term function (two weeks to less than three months of follow-up)

1 in 6 with radicular low back pain was helped: long-term function (12 months or greater follow-up)

No other benefits in pain, function, need for surgery, or improvement in quality of life were reported for nonradicular low back pain or spinal stenosis

#### Harms

No reported adverse events or serious adverse events, including transient hyperglycemia

caused by cancer, cauda equina syndrome, fracture, or pregnancy were excluded.

The primary outcomes of these studies were pain (continuous pain measured by pain scales or a dichotomous outcome measured by categories) and function (defined by methods in original trials). The studies also looked for severe adverse reactions and transient hyperglycemia.

For low back pain with radiculopathy, corticosteroids were found to be more effective than placebo for short-term (two weeks to less than three months) pain control when measured as a continuous outcome on a scale of 0 to 10 (mean difference = -0.56; 95% CI, -1.08 to -0.04; n = 430), with higher numbers signifying more severe pain. No significant difference in pain control was found in nonradicular low back pain or spinal stenosis when treated with systemic corticosteroids in the immediate term (less than two weeks) or long term (12 months or greater).

No improvement in function was reported in the immediate term regardless of the type of back pain. In the short term, patients with radicular low back pain reported improved function after receiving corticosteroids compared with placebo (risk ratio [RR] = 1.52; 95% CI, 1.22 to 1.91; absolute risk difference [ARD] = 17.8%; number needed to treat [NNT] = 6; moderate-quality evidence; n = 403), but this effect was not statistically significant for patients with nonradicular pain. The one study reporting

### The NNT Group Rating System

<b>Green</b>	Benefits greater than harms
<b>Yellow</b>	Unclear benefits
<b>Red</b>	No benefits
<b>Black</b>	Harms greater than benefits

on long-term function showed a benefit with corticosteroids over placebo in radicular low back pain (RR = 1.29; 95% CI, 1.06 to 1.56; ARD = 17; NNT = 6; n = 267).

Three trials reported on transient hyperglycemia, defined as a short-term blood glucose increase of 50 mg per dL (2.77 mmol per L) or greater. There was no significant difference between corticosteroids and placebo.

**Caveats:** The Cochrane review included subgroup analyses, of which some demonstrated a benefit of corticosteroids in low back pain and others did not, making it difficult to determine an overarching conclusion. The differences in study type, outcomes measured, and treatments delivered among studies limit generalizability. This meta-analysis did not establish an optimal corticosteroid dose and duration for radicular low back pain.

All significant outcomes were found within the subgroup analysis of radicular back pain. Short-term pain improvement was clinically modest, at an average of a 0.5-point improvement on a scale of 0 to 10. Among the five studies that measured pain as continuous, only two had a low risk of bias in all domains. Among studies evaluating function dichotomously, the definition varied from “return to normal activities,” “no disability,” or “improvement on a disability scale.” Short-term functional improvement was based on three studies (n = 403), with only one study identified as having a low risk of bias in all domains. Improvement in long-term function was based on one study (n = 267) with a low risk of bias in all domains and was defined as a 50% or greater improvement on the Oswestry Disability Index. The definitions of pain categories, pain scales, and functions varied across studies, further limiting conclusions.

The meta-analysis reported low certainty about the risks associated with treating low back pain with corticosteroids. Many studies were missing data on relevant harms from corticosteroids, such as hyperglycemia, which limited the accurate reporting of potential harms. Of the three studies including these data, only two had information

on steroid dosing. These studies focused only on disease-oriented outcomes (degree of transient hyperglycemia) without data on hospitalization, titration of medication, or long-term outcomes such as bony fractures. The inability to accurately weigh the benefits of treatment against associated risk is an important factor as physicians consider the modest benefit in pain reduction and improved function in radicular back pain, especially in patients at higher risk of complications.

**Conclusion:** We assigned a color recommendation of yellow (unclear benefits) due to modest improvements for radicular back pain and an incomplete view of potential patient-oriented harms. The most clinically meaningful evidence to patients is the potential for corticosteroids to improve short-term function. Therefore, until further studies quantify harms, specifically for populations such as patients with diabetes mellitus or older people, we recommend a short course of systemic corticosteroids only for patients with low back pain and clinical signs of radicular pain.

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This series is coordinated by Christopher W. Bunt, MD, *AFP* assistant medical editor, and the NNT Group.

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**Author disclosure:** No relevant financial relationships.

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