

# Systematic Review Snapshot

## TAKE-HOME MESSAGE

Inhaled corticosteroids, either in conjunction with or in place of oral steroids, do not reduce acute asthma relapse rates compared with standard oral steroid therapy after emergency department (ED) discharge for acute asthma.

## METHODS

### DATA SOURCES

Cochrane Airways Review Group register, which includes searches of EMBASE, MEDLINE, and CINAHL databases, was searched for controlled clinical trials. Hand searching of respiratory journals and conference presentations was performed. Bibliographies from included studies were searched and primary authors and pharmaceutical companies were contacted to find eligible studies up to September 2012.

### STUDY SELECTION

Only randomized controlled trials or quasi-randomized controlled trials were included. Patients had to be treated for acute asthma in the ED and discharged with inhaled corticosteroid therapy either in place of or in addition to oral corticosteroids. Studies with children younger than 2 years or with bronchiolitis were excluded. The primary outcome of interest was acute asthma relapse rate at 7 to 10 days.

### DATA EXTRACTION AND SYNTHESIS

Two review authors independently extracted data from the published articles. The Cochrane Review

## Are Inhaled Steroids Beneficial on Discharge From the Emergency Department for Acute Asthma?

### EBEM Commentators

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### Results

**Table.** Asthma relapse at 7 to 10 days: inhaled corticosteroid therapy alone or in addition to oral steroids versus standard oral steroid therapy on ED discharge.

	Trials	N	Odds Ratio (95% CI)
ICS plus oral steroids	3	909	0.72 (0.48–1.10)
ICS alone	4	684	1.00 (0.66–1.52)

ICS, Inhaled corticosteroid.

Of the included trials, 3 compared inhaled corticosteroid plus oral steroids with oral steroids alone, and 9 compared inhaled corticosteroid alone with oral steroids. Only 4 of the 9 trials in the inhaled corticosteroid alone versus oral steroids group provided data on acute asthma relapse, and there was no significant difference in relapse rates or secondary outcome measures. In the inhaled corticosteroid plus oral steroid group, acute relapse rates were reduced, but this was not statistically significant and no significant differences were noted for secondary outcomes of relapse requiring admission, quality of life, adverse events, or symptom scores. For asthma relapse at 7 to 10 days, there was no significant heterogeneity

( $I^2=0$ ) for either the inhaled corticosteroid plus oral steroid or the inhaled corticosteroid alone comparisons.

### Commentary

Asthma is a common medical condition, accounting for approximately 2 million ED visits a year in the United States.<sup>1</sup> The majority of these patients are discharged from the ED after treatment, but 10% to 20% will relapse in the following 2 weeks.<sup>2-4</sup> Standard treatment for acute asthma includes  $\beta_2$ -agonists and systemic corticosteroids (either oral or parenteral), but the role of inhaled corticosteroid in acute asthma remains unclear. Potential benefits of inhaled corticosteroid over oral steroids

Manager software was used to analyze the data, and dichotomous outcomes were published as odds ratios or relative risks with 95% confidence intervals (CIs). For continuous outcomes, a mean difference or standard mean difference was used. Heterogeneity was reported with the  $I^2$  test and a fixed-effect model was used to combine results.

include reduced systemic adverse effects, direct delivery to the airway, and improved outcomes.<sup>5</sup> Although the additional cost of inhaled corticosteroid compared with that of oral steroids might limit its use in the ED setting, many patients presenting to the ED with acute asthma meet criteria for long-term inhaled corticosteroid therapy, and it may be a good preventive measure to initiate inhaled corticosteroid therapy while awaiting primary care follow-up.

This systematic review examined whether inhaled corticosteroids are beneficial in place of, or in addition to, oral steroids on discharge from the

ED for acute asthma. For the primary outcome of acute asthma relapse, there was no difference in patients who received inhaled corticosteroid alone versus oral steroids. In the inhaled corticosteroid plus oral steroid group, there was a trend toward decreased acute asthma relapse compared with that for only oral steroids, but further studies with larger sample sizes would be needed to potentially demonstrate a significant reduction in ED recidivism. Some of the benefits of adding inhaled corticosteroid to oral steroids likely arise from the fact that many of these patients should already be receiving maintenance inhaled corticosteroid therapy.

Although the inhaled corticosteroid alone versus the oral steroid group did not show a significant difference in asthma relapse (odds ratio 1.0; 95% CI 0.66 to 1.52), it is difficult to conclude that the 2 treatments are equal because none of the studies were powered for equivalence and only patients with mild asthma were included. Furthermore, research is needed to determine whether there are patient subgroups that may benefit from the addition of inhaled

corticosteroid to oral steroids at ED discharge.

Editor's Note: This is a clinical synopsis, a regular feature of the *Annals'* Systematic Review Snapshot (SRS) series. The source for this systematic review snapshot is: Edmonds ML, Milan SJ, Brenner BE, et al. Inhaled steroids for acute asthma following emergency department discharge. *Cochrane Database Syst Rev*. 2012;(12):CD002316. <http://dx.doi.org/10.1002/14651858.CD002316.pub2>.

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Michael Brown, MD, MSc, Alan Jones, MD, and David Newman, MD, serve as editors of the SRS series.

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