

and 1.58 exacerbations in group 3). Three patients in group 1 and 9 patients in group 2 were withdrawn because of asthma deterioration after 6 months of treatment. The number of asthma-free days did not differ between groups 1 and 2 but remained better than in group 3. Growth velocity was normalized in groups 1 and 2.

**CONCLUSIONS.** Regular use of budesonide afforded better asthma control but had a more systemic effect than did as-needed use of budesonide.

**REVIEWER COMMENTS.** It is not a surprise that the inhaled corticosteroids achieved better asthma control than did cromolyn and are the preferred medications. The question addressed by this study is whether inhaled corticosteroids can be used as needed versus continuously. Although these 2 approaches did not differ in lung function or number of asthma-free days, the continuous-treatment group had significantly fewer exacerbations. An accompanying editorial (Pedersen S. *Arch Dis Child*. 2008;93[8]:644–645) asks, “Do the benefits of daily inhaled steroid treatment of mild asthma outweigh the risks?” and answers in the affirmative, noting that regular use is safe (6 of 7 studies found no long-term effects on growth), as well as more effective and less expensive than any other treatment.

URL: [www.pediatrics.org/cgi/doi/10.1542/peds.2009-1870QQQ](http://www.pediatrics.org/cgi/doi/10.1542/peds.2009-1870QQQ)

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### **Preemptive Use of High-Dose Fluticasone for Virus-Induced Wheezing in Young Children**

Ducharme FM, Lemire C, Noya FJD, et al.  
*N Engl J Med*. 2009;360(4):339–353

**PURPOSE OF THE STUDY.** To examine the efficacy and safety of preemptive, high-dose fluticasone treatment in reducing the severity of recurrent virus-induced wheezing in children.

**STUDY POPULATION.** Children between 1 and 6 years of age ( $N = 129$ ) with moderate-to-severe, virus-induced wheezing were included. The investigators tried to exclude subjects with sensitization to aeroallergens, but 7% of the randomly assigned children developed symptoms of persistent or atopic asthma during the study period.

**METHODS.** The subjects received 750  $\mu\text{g}$  of fluticasone propionate or placebo twice daily, beginning at the onset of an upper respiratory infection and continuing for a maximum of 10 days, over a period of 6 to 12 months. The primary outcome measured was the use of rescue oral

steroid treatment. Secondary outcomes included symptoms, use of  $\beta_2$ -adrenergic receptor agonists, acute care visits, hospitalizations, discontinuation of study drug administration, changes in growth and bone mineral density, basal cortisol level, and adverse events.

**RESULTS.** Over a median period of 40 weeks, 8% of upper respiratory infections in the fluticasone group led to systemic steroid treatment, compared with 18% in the placebo group (odds ratio: 0.49). However, children treated with fluticasone, compared with the placebo group, had smaller gains in height ( $6.23 \pm 2.62$  vs  $6.56 \pm 2.90$  cm) and weight ( $1.53 \pm 1.17$  vs  $2.17 \pm 1.79$  kg). There were no significant differences between the groups in basal cortisol levels, bone mineral density, or adverse events.

**CONCLUSIONS.** In preschool-aged children with moderate-to-severe, virus-induced wheezing, preemptive treatment with high-dose fluticasone, compared with placebo, reduced the use of rescue oral steroid treatment. High-dose fluticasone treatment, however, was associated with smaller gains in height and weight. Therefore, the authors concluded that this approach should not be adopted in clinical practice until long-term adverse effects are clarified.

**REVIEWER COMMENTS.** The investigators showed, on one hand, improvement in the need for oral steroid treatment for children treated with high-dose fluticasone but, on the other hand, smaller gains in height and weight for these patients. The question for the rest of us is how to incorporate these new data into clinical practice. For example, the dose of fluticasone that was used was quite substantial for small children. Was this dose on the flat part of the dose-response curve for corticosteroids? Would a smaller dose give the same benefit without the detriment? Also, how do these data apply to children with clinical allergy or risk factors for allergy?

URL: [www.pediatrics.org/cgi/doi/10.1542/peds.2009-1870RRR](http://www.pediatrics.org/cgi/doi/10.1542/peds.2009-1870RRR)

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### **Effect of Long-term Corticosteroid Use on Bone Mineral Density in Children: A Prospective Longitudinal Assessment in the Childhood Asthma Management Program (CAMP) Study**

Kelly HW, Van Natta ML, Covar RA, et al.  
*Pediatrics*. 2008;122(1). Available at: [www.pediatrics.org/cgi/content/full/122/1/e53](http://www.pediatrics.org/cgi/content/full/122/1/e53)

**PURPOSE OF THE STUDY.** To evaluate the effects of multiple short courses of oral corticosteroid treatment and long-

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