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This clinical content by Drs. Saguil and Okpokwasili conforms to AAFP criteria for evidence-based continuing medical education (EB CME). See CME Quiz on page 326.

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### Physical Training for Patients with Asthma

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#### Clinical Question

Should physicians prescribe physical training to improve symptom control and quality of life for patients with asthma?

#### Evidence-Based Answer

Physical training lasting for at least 20 to 30 minutes, two to three times a week for at least six weeks, improves physical fitness in patients with asthma. Physical training is not associated with worsening of asthma symptoms, and it improves health-related quality of life. (Strength of Recommendation: B, based on inconsistent or limited-quality patient-oriented evidence.)

#### Practice Pointers

Asthma affects 300 million persons worldwide.<sup>1</sup> In the United States, the prevalence of asthma increased from 7.3 percent in 2001 to 8.2 percent in 2009, affecting nearly 25 million persons.<sup>2</sup> Despite being treatable, asthma was responsible for 10.5 million missed school days and 14.2 million missed work days in 2008, and was responsible for 1.75 million emergency department visits and 456,000 hospitalizations in 2007.<sup>3</sup>

This Cochrane review examined the effect of medically supervised physical training on the health of persons with asthma. Training programs consisted of aerobic and strength training lasting 30 to 90 minutes, two to three days per week for six to 16 weeks. Outcomes included physiologic measurements, exercise capacity, and measures of asthma severity and health-related quality of life. Although 19 studies with 695 patients eight years and older were included, different outcome measures limited the ability to pool results. In com-

parison with those in education-only control groups, patients who participated in physical training programs improved their cardiopulmonary fitness as measured by maximum oxygen uptake (mean difference = 5.57 mL per kg per minute; 95% confidence interval [CI], 4.36 to 6.78; six studies with 149 participants). Physical training also improved maximum expiratory ventilation (mean difference = 6.0 L per minute; 95% CI, 1.57 to 10.43; four studies with 111 participants); there was no effect on resting lung function. Four out of five studies demonstrated a positive effect on health-related quality of life. No adverse effects of training on asthma symptoms were reported.

The improvements in cardiorespiratory parameters are clinically significant. An increase in maximum oxygen uptake of 5.57 mL per kg per minute is equivalent to the difference between being limited to light activities (e.g., desk work) to tolerating moderate activities (e.g., walking or biking).<sup>4,5</sup> Also, the improvements in quality of life are considered to be clinically significant.<sup>6,7</sup>

The physical training regimens in this study were conducted under controlled conditions and may not be generalizable. On the other hand, because none of the programs in this review were associated with adverse effects, it would seem reasonable for physicians to recommend that patients with asthma take advantage of locally available physical training programs.

Although clinical practice guidelines note that exercise is a potential trigger of asthma, the National Asthma Education and Prevention Program advocates promoting physical activity,<sup>8</sup> and the Scottish Intercollegiate Guidelines Network suggests that physical training be viewed as part of the general approach to improving the lifestyle of patients with asthma.<sup>9</sup>

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The opinions and assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the U.S. Army Medical Department or the U.S. Army Service at large.

SOURCE: Chandratilleke MG, Carson KV, Picot J, Brinn MP, Esterman AJ, Smith BJ. Physical training for asthma. *Cochrane Database Syst Rev*. 2012;5:CD001116.

The practice recommendations in this activity are available at <http://summaries.cochrane.org/CD001116>.

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## Vitamin D Supplementation for Women During Pregnancy

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### Clinical Question

Does vitamin D supplementation in pregnancy decrease the risk of having a low-birth-weight infant?

### Evidence-Based Answer

In several small, low-quality trials, vitamin D supplementation in pregnancy was associated with a statistically nonsignificant trend toward a decreased risk of low birth weight. There is insufficient evidence to recommend routine vitamin D supplementation in pregnancy. (Strength of Recommendation: C, based on consensus, disease-oriented evidence, usual practice, expert opinion, or case series.)

### Practice Pointers

Recent evidence supports a role for vitamin D supplementation in adults, particularly older adults,<sup>1</sup> to reduce the

incidence of osteoporotic fractures. Research also has found an association between low vitamin D levels in pregnant women and poor pregnancy outcomes,<sup>2,3</sup> specifically low birth weight (i.e., less than 2,500 g [5 lb, 9 oz]). Although the reason for this association is unclear, it may be that women with normal levels of vitamin D also have better general nutrition, which contributes to normal fetal growth.

The authors of this Cochrane review analyzed the results of several small randomized trials of vitamin D supplementation in pregnancy. Three trials involving 463 women examined low birth weight as an outcome, and showed a statistically nonsignificant trend toward a reduced risk of having a low-birth-weight infant (risk ratio = 0.48; 95% confidence interval, 0.23 to 1.01). It does not appear that these results were adjusted for gestational age, raising the question of whether the observed effect may have represented an actual reduction in preterm births. Also, the included trials had several quality issues: a lack of information about the randomization process; missing data in some studies and failure to perform intention-to-treat analyses; and a lack of standardized vitamin D dosing. Many of the participants were of Asian and African descent, which may limit generalizability to other populations.

Therefore, although vitamin D supplementation in pregnancy looks encouraging as a means of preventing low birth weight, the evidence does not yet support routine supplementation. The American College of Obstetricians and Gynecologists (ACOG) recommends testing only pregnant women who are at increased risk of vitamin D deficiency (e.g., women with limited sun exposure, women with darker skin that limits absorption of vitamin D).<sup>4</sup> If a woman's vitamin D levels are 20 ng per mL (50 nmol per L) or less, ACOG recommends vitamin D supplementation in a dosage of 1,000 to 2,000 IU daily.

Author disclosure: No relevant financial affiliations.

SOURCE: De-Regil LM, Palacios C, Ansary A, Kulier R, Peña-Rosas JP. Vitamin D supplementation for women during pregnancy. *Cochrane Database Syst Rev*. 2012;2:CD008873.

The practice recommendations in this activity are available at <http://summaries.cochrane.org/CD008873>.

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