

## Electronic Cigarettes for Smoking Cessation

KRISTIN BOND, MD, and NATALIE NUNES, MD, *Tacoma Family Medicine Residency, Tacoma, Washington*

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### Clinical Question

Are electronic cigarettes (e-cigarettes) effective for smoking cessation in adults?

### Evidence-Based Answer

Nicotine-containing e-cigarettes may be more effective than placebo devices for smoking cessation. They may also aid in smoking reduction, but the quality of available evidence is low. (Strength of Recommendation [SOR]: B, based on a systematic review.) Little is known about their safety.

A systematic review pooled two randomized controlled trials (RCTs) and found six-month quit rates of 9% for e-cigarettes compared with 4% for placebo (N = 662; relative risk [RR] = 2.29; 95% confidence interval [CI], 1.05 to 4.96).<sup>1</sup> The number of participants who reported reducing their cigarette consumption by at least 50% was 36% in the nicotine-containing e-cigarette group compared with 27% in the placebo group (N = 612; RR = 1.31; 95% CI, 1.02 to 1.68).

A double-blind RCT enrolled 362 healthy adults who desired to quit smoking.<sup>2</sup> Their average age was 43 years, 62% were female, and they had a smoking history of at least 10 cigarettes per day for at least one year. The study compared six-month smoking cessation rates in those who used a nicotine-containing e-cigarette vs. a non-nicotine-containing placebo e-cigarette. There was no significant difference in quit rates between groups (7.3% vs. 4.1% in the placebo group; RR = 1.8; 95% CI, 0.54 to 5.8). However, because quit rates were lower than expected, the study was underpowered to detect a difference between groups. The time to relapse was not significantly longer in the nicotine group (35 vs. 12 days in the placebo group;  $P = .09$ ). There was no difference in the number of patients who decreased their daily cigarette use ( $P = .08$ ). The rate of adverse events was similar.

A double-blind RCT enrolled 300 healthy middle-aged adults (63% male) who smoked more than 10 cigarettes per day for at least five years and who did not desire to quit.<sup>3</sup> Smoking cessation rates were compared between three groups: two received different doses of nicotine-containing e-cigarettes, and the third received a non-nicotine-containing e-cigarette. There was a significant reduction in number of cigarettes smoked per day in all three groups (19, 21, and 22 at study beginning vs. 12, 14, and 12 at study conclusion;  $P < .001$  for before-after comparison within each group). However, there were no differences at 24 or 52 weeks. There was no significant difference in quit rates at 52 weeks (13% vs. 9% vs. 4%;  $P = .24$ ).

The U.S. Food and Drug Administration is reviewing the regulatory status of e-cigarettes. In 2015, it issued warning letters to three major e-cigarette companies for violations, including unsubstantiated claims and violating the Federal Food, Drug, and Cosmetic Act.<sup>4</sup>

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Address correspondence to Kristin Bond, MD, at [kristinbond@gmail.com](mailto:kristinbond@gmail.com). Reprints are not available from the authors.

Author disclosure: No relevant financial affiliations.

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