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## Q/ Do pedometers increase activity and improve health outcomes?

### EVIDENCE-BASED ANSWER

**A/ YES.** In overweight and obese patients, exercise interventions using a pedometer increase steps by about a mile per day over the same interventions without access to pedometer information (strength of recommendation [SOR]: **A**, meta-analysis of randomized controlled trials [RCTs]) and are associated with a modest 4 mm Hg reduction in systolic blood pressure (BP) over baseline (SOR: **B**, meta-analysis of RCTs and cohort studies). In overweight patients with diabetes, pedometer use with nutritional counseling is associated with 0.86 kg greater weight loss

than nutritional counseling alone (SOR: **B**, meta-analysis of lower quality RCTs).

Pedometers increase activity in patients with various musculoskeletal conditions and may help reduce pain (SOR: **B**, meta-analysis of RCTs with heterogeneous outcomes). In low-activity elderly patients, pedometers do not appear to increase total activity when added to an exercise program, but they do appear to increase walking (SOR: **B**, RCT).

There is no evidence concerning the impact of pedometers on cardiovascular outcomes.

### Evidence summary

A systematic review and meta-analysis identified 26 studies evaluating activity and health outcomes with the use of pedometers.<sup>1</sup> The studies included 8 RCTs and 18 observational studies with 2767 patients (mean body mass index [BMI]: 30 kg/m<sup>2</sup>; mean age: 49 years; 85% women). The studies ranged from 3 to 104 weeks. From the RCT data, patients using pedometers had an increase of 2491 steps per day (about one mile) more than control group patients (8 trials, n=305; 95% confidence interval [CI], 1098-3885 steps/day; *P*<.001).

Across all of the observational studies, pedometer users had a 26.9% increase from their baseline physical activity (*P*=.001). When data from all of the studies were combined, the researchers found a decrease from baseline BMI (18 studies, n=562; mean difference [MD]=0.38 kg/m<sup>2</sup>; 95% CI, 0.05-0.72; *P*=.03) and a decrease in systolic BP (12 studies, n=468; MD=3.8 mm Hg; 95% CI,

1.7-5.9 mm Hg; *P*<.001). No statistically significant change was noted in cholesterol or fasting glucose levels. Weaknesses of this review include the heterogeneity of the interventions, relatively small study sizes, and short study durations.

### Reduced weight, BMI in patients with type 2 diabetes

A systematic review and meta-analysis of 11 RCTs (N=1258) evaluated pedometer effects in overweight patients with type 2 diabetes.<sup>2</sup> (One RCT was included in the above meta-analysis.) Studies ran from 6 to 48 weeks, and mean enrollment BMI (where reported) was 30 kg/m<sup>2</sup> or more in at least one treatment arm. Compared to controls, patients using pedometers had greater reductions in weight (weighted mean difference [WMD]= -0.65 kg; 95% CI, -1.12 to -0.17 kg) and BMI (WMD= -0.15 kg/m<sup>2</sup>; 95% CI, -0.29 to -0.02 kg/m<sup>2</sup>). The effect persisted

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in the subset of studies in which the intervention and control groups both received dietary counseling (WMD weight= -0.86 kg; 95% CI, -1.45 to -0.27 kg; WMD BMI= -0.30 kg/m<sup>2</sup>; 95% CI, -0.50 to -0.10 kg/m<sup>2</sup>). Study quality was low to moderate, and 5 studies used per-protocol analysis instead of intention-to-treat analysis.

**Pedometer use benefits patients with musculoskeletal diseases, too**

A systematic review and meta-analysis examined the use of pedometers in patients with musculoskeletal diseases.<sup>3</sup> It included 7 RCTs lasting 4 weeks to one year with 484 adults, 40 to 82 years of age, with musculoskeletal disorders (eg, back pain, knee pain, hip pain). (One RCT was also included in the diabetes meta-analysis.) Pedometer use resulted in a mean increase in physical activity of 1950 steps per day above baseline (range=818-2829 steps/day; *P*<.05). The authors noted that 4 of the 7 studies also demonstrated significant improvement in

pain scores and physical function. BMI data were not tracked in this review.

**Pedometers increase walking in older patients**

A RCT compared the effects of pedometer-based activity prescriptions with standard time-based activity prescriptions in 330 patients ≥65 years of age with baseline low activity levels.<sup>4</sup> All patients received an initial physician visit followed by 3 telephone counseling sessions encouraging increased activity. The pedometer group was counseled on increasing steps (without specific targets), while the standard activity prescription group received time-related activity goals.

At one year, “leisure walking” had increased more for the pedometer group than for the standard group (mean 50 minutes/week vs 28 minutes/week; *P*=.03), although both groups equally increased their amount of “total activity.” Blood pressure decreased equally in both groups, while BMI was unchanged in either.

JFP

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