# DPP: Physical Activity, Apart From Weight Loss, May Stop Diabetes

Marlene Busko | June 27, 2016

NEW ORLEANS — A new analysis of data from the 3-year Diabetes Prevention Program (DPP) and its 12-year extension, the DPP Outcomes Study (DPPOS), reports that physical activity, independent of weight loss, prevented diabetes in some individuals with prediabetes.

Specifically, in this racially and geographically diverse sample of prediabetic, overweight, or obese middle-aged men and women, every added 1.5 hours of brisk walking a week (or equivalent activity) reduced their likelihood of developing diabetes by 2%, whether or not they lost weight.

And participants who were inactive to start with (defined as doing less than 150 minutes of at least moderate physical activity each week) were more likely to see this benefit.

Thus, clinicians and diabetes researchers "need to start paying more attention to physical activity," Andrea M Kriska, PhD, professor in the department of epidemiology at the University of Pittsburgh Graduate School of Public Health, Pennsylvania, said during a press briefing on June 14 prior to presenting the study at the American Diabetes Association (ADA) 2016 Scientific Sessions.

The takeaway message for healthcare professionals is "You need to look beyond your patient's weight and consider physical activity in your attempts to prevent his or her progression to diabetes," she said. "Both are important and both need to be supported," she stressed.

To *Medscape Medical News,* she clarified that at the 3-year end of the DPP, participants who had been randomized to receive an intensive lifestyle intervention were 58% less likely to have developed diabetes than those in the placebo group, and after 15 years, they were 27% less likely to have developed diabetes than people in the placebo group.

"It does appear as if the physical activity itself, regardless of weight loss, is a significant contributor to the prevention of diabetes," press-briefing moderator Ann Albright, PhD, director of the division of diabetes translation at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, told *Medscape Medical News*.

This research "reinforces that it isn't just diet; it's diet and exercise. So we have to help people do those in ways that are realistic," she said.

**15-year Combined DPP and DPPOS Studies**

As previously published, the DPP randomized 3234 nondiabetic people who had elevated fasting and post-glucose-load glucose levels to metformin (850 mg twice daily), placebo, or an intensive lifestyle intervention, Dr Kriska explained (*N Engl J Med*. 2002;346:393-403).

Participants in the intensive lifestyle intervention group received 16 one-on-one sessions on diet, exercise, and behavior modification over 6 months, followed by an individual or group session every month. Participants in the other two groups received standard lifestyle advice consisting of written information about diet and exercise plus brief individual counseling once a year.

Overall, the participants had a mean age of 53 years and a mean body mass index of 34 kg/m$^2$; almost half (45%) were from racial/ethnic minority groups and 68% were women.

The goals of the intensive lifestyle program were for participants to lose 7% of their initial weight and do at least 150 minutes of moderate to vigorous physical activity a week, as recommended by the US Surgeon General — "not to add 150 minutes to their current level," Dr Kriska clarified.

After a mean follow-up of 2.8 years in the DPP, the incidence of diabetes was 11.0, 7.8, and 4.8 cases per 100 person-years

in the placebo, metformin, and lifestyle groups, respectively.

Because of the success of the intensive lifestyle intervention, in the DPPOS all participants were given a modified intensive lifestyle intervention of classes four times a year (placebo and metformin groups) or six times a year (intensive lifestyle intervention group) for another 12 years.

The DPPOS included 1793 participants from the DPP: 589 from the intensive lifestyle group, 599 from the metformin group, and 605 from the placebo group.

**Does Physical Activity Prevent/Delay Progression to Diabetes?**

The current study looked at whether the 58% decrease in onset of diabetes in the DPP and 27% decrease in the DDPOS in the intensive lifestyle arm could be explained by the difference in physical activity, independent of weight loss.

Throughout the study and its extension, participants had a yearly oral glucose tolerance test and a semiannual fasting plasma glucose test (to determine diabetes onset). Each year, they replied to a Modifiable Activity Questionnaire to assess their level of physical activity over the past year.

Participants in the DPPOS also wore an accelerometer for a week, and the measured levels of physical activity correlated well with their self-reported levels of physical activity.

Over the combined study period, physical activity was indeed significantly inversely associated with diabetes incidence, after controlling for age, sex, baseline physical activity, and weight.

**Debate About Attainable Fitness, Diabetes Prevention**

But one expert questioned the realistic contribution that exercise can make to the equation, stating that many overweight and obese patients have little idea how much exercise is needed to be of benefit.

Ralph A DeFronzo, MD, professor of medicine and chief of the diabetes division at the University of Texas Health Science Center, San Antonio, told *Medscape Medical News* that “people have *no* idea how you translate exercise to calories." Someone who can run a mile in 8 minutes will burn off 120 calories and, if the pace is kept for 3 miles, will burn off 360 calories, he explained.

But if "you ask your [obese] patients, 'Can you run a mile?' The answer is no," he continued. If patients can walk a mile, they may burn off 80 to 100 calories. Even if they can run 3 miles, they probably don't realize that "all you need is one piece of pie, and you’ve obliterated" the calorie deficit.

This disconnect may help explain why people fail to lose weight over the long term, he suggested. "The problem with lifestyle is that if you can get people to lose weight and keep it off, it’s the best treatment in the world. But it does not work on a long-term basis for most people — in the 10% to 20% of people in whom it works, it's great."

And regarding this specific study, he said the interventions in the DPP slowed the development of diabetes rather than preventing it altogether. "If you take the DPP data, if you lost 4% of your body weight and you maintained it throughout the entire duration of the DPP, you would delay the onset of diabetes for 4 years; you would *not* prevent it," he noted.

Nevertheless, Drs Kriska and Albright remain upbeat about the success of the DPPOS and stress the new results indicate that the sustained benefits of keeping active throughout middle age, independent of weight loss.

"My goodness, [in the DPPOS] there's still a 30% improvement after 15 years of lifestyle intervention!" Dr Albright exclaimed. And that is comparing the lifestyle intervention group with patients who also received lifestyle intervention later on.

"It's not easy, but from my perspective at CDC, this is our time to actually build a lifestyle distribution system in this country," she said.

"If we can get a third or even a quarter of those folks" to up their physical activity, "it will make a big difference to change the

trajectory" of the increasing incidence of diabetes, she concluded.

*Drs Kriska and Albright have no relevant financial relationships. Dr DeFronzo is on the speaker's bureau of, receives grants from, and/or is a consultant for Novo Nordisk, AstraZeneca, Janssen, and Intarcia.*

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American Diabetes Association 2016 Scientific Sessions; June 14, 2016; New Orleans, Louisiana. Abstract 379-OR



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Cite this article: DPP: Physical Activity, Apart From Weight Loss, May Stop Diabetes. *Medscape*. Jun 27, 2016.