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Verner Thomas

DEPLOY Lifestyle Interventions Delay, Prevent Type 2 Diabetes

Verner Thomas

At age 61, retired and overweight, Verner Thomas joined the YMCA to try to improve her health. On one of her visits, she was handed a brochure asking if she'd like to participate in something called the "Diabetes Education & Prevention with a Lifestyle Intervention Offered at the YMCA," or DEPLOY. DEPLOY is testing a diabetes prevention model in which YMCA employees are trained to help people who have risk factors for type 2 diabetes lose weight and increase their physical activity.

With support from NIDDK and in cooperation with the YMCA, the DEPLOY program is building on previous NIDDK-supported research that demonstrated that, in people at high risk, an intensive lifestyle intervention can be an extremely effective means of preventing or delaying the onset of type 2 diabetes.

"My daughter is really proud of me," says Verner. "She says 'Momma, you look better and feel better. You're just a much more vibrant person. I want you to keep this up!'"

And Verner is a reaffirmation of those findings.

Prior to involving herself in the program, Verner's blood sugar and weight strongly indicated that she was at high risk of developing type 2 diabetes within the next 1 to 2 years. Additionally, her cholesterol levels were abnormally high. Today, 2 years after being introduced to the DEPLOY program, Verner exercises regularly, eats a more disciplined diet, and in general is more conscious of the lifestyle that she leads. As a result, she has lost weight, lowered her blood sugar levels, improved her cholesterol levels, and, best of all, has remained diabetes free.

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After speaking with Verner, one gets the feeling that her daughter was preaching to the choir. Ms. Thomas is well aware of the positive changes she's made in her life as a result of DEPLOY.

Type 2 Diabetes—Reducing the Burden

Diabetes is a chronic, common, and costly disease that is robbing many Americans of good health and quality of life. Type 2 diabetes—once known as adult-onset diabetes, or non-insulin-dependent diabetes

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mellitus—is the most common form of the disease. It primarily affects adults, but it can develop in childhood and adolescence. Older age, overweight, and inactivity are strong risk factors for type 2 diabetes; heredity plays an important role as well. People with diabetes have blood sugar levels that are above normal. Over the years, high blood sugar damages nerves and blood vessels, leading to serious health complications such as heart disease, stroke, blindness, kidney disease and kidney failure, the need for lower limb amputations, and gum infections.

Ominously, Verner is hardly alone when it comes to being at high risk for type 2 diabetes. People who, like Verner did, have blood sugar levels higher than normal, but not high enough to be classified as diabetes, are considered to have "pre-diabetes." In addition to 23.6 million Americans who already have type 2 diabetes, the Centers for Disease Control and Prevention estimates that at least another 57 million have pre-diabetes, and thus are at high risk of progressing to type 2 diabetes.

Importantly, there is a window of opportunity to reverse course on the way to developing type 2 diabetes. Spearheaded by the NIDDK, the landmark Diabetes Prevention Program, or DPP, was a clinical trial that showed that in overweight people with pre-diabetes, type 2 diabetes can be prevented or delayed through use of the diabetes medication metformin, or through a lifestyle intervention leading to moderate weight loss through diet and exercise. The immense success of the intensive lifestyle intervention, which showed a 58 percent reduction in risk of developing diabetes, has led to new research studies and programs testing ways to effectively translate these results into interventions that can be widely and effectively implemented to prevent diabetes in those at risk.

Translating DPP with the DEPLOY Program

Verner's mother had diabetes, as did her grandmother. She has a family history on her father's side of high blood pressure, as well as a history of obesity on both sides of her family. Verner also understands that, as an African American, she has a 1.8-fold increased risk of developing type 2 diabetes compared to non-Hispanic whites.

"This program (DEPLOY) makes you aware of what you should be doing and what you're not doing to protect yourself against type 2 diabetes," says Verner. "It motivated me to take better care of myself—how I eat and exercise….I wasn't as faithful in my exercising until I got into the program."

Operating out of local YMCAs, and led by primary investigator Dr. Ronald Ackermann of the Indiana University School of Medicine, DEPLOY takes groups of 8 to 12 people who, like Verner, have pre-diabetes and other risk factors, and puts them through a series of classroom-style meetings that focus on knowledge building and skill development to help them set goals, self-monitor, and problem-solve around their pre-diabetes. Major goals of the program include a 5 to 7 percent reduction in baseline weight, and 150 minutes per week of moderate level physical activity similar to brisk walking. The program is based on the lifestyle intervention that proved so effective at delaying or preventing type 2 diabetes among participants in the DPP.

Verner first started with DEPLOY in January 2006. Since then, in addition to remaining diabetes free, her weight has gone from 219 pounds down to 177, and her blood pressure has gone from 133/90 to 110/72 (normal is 120/80 or lower). Her body mass index (BMI) has also dropped from 33 to 29. BMI is a measure of weight relative to height. A BMI of 30 or more in an adult is considered obese. Verner thus is no longer obese—a significant achievement. She remains determined to get her BMI still lower. But in all categories, including her sugar and cholesterol levels, Verner's numbers are heading in the right direction. Her fasting blood sugar has fallen from 111 to 90 milligrams per deciliter, meaning she no longer has pre-diabetes—and for that she is grateful.

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"I feel healthier and stronger today than I did 2½ years ago," says Verner. "I've gotten a lot of compliments since I lost the weight, and psychologically I feel better. I'm more open, social, and outgoing," she adds with a satisfying chuckle.

She admits that she also still faces some challenges. "My problem is sweets," says Verner. "When I'm under stress I fall back on them." But she says that for the most part she's been able to keep her sweet tooth under control, as well as the rest of her diet.

To meet their goal of moderate weight loss, participants in DEPLOY are counseled to increase physical activity and to reduce their intake of fat and total calories. The diet and exercise interventions are flexible and sensitive to individual, cultural, and community differences where they are implemented. As part of her diet, Verner eats fish occasionally, and in addition, she says, "I only eat one egg a month. I get my protein from peanut butter, beans, and meat substitutes."

Looking to the Future

Researchers are making major discoveries in how to predict who will develop type 2 diabetes and its complications; how to personalize individual treatments; and how to use this information to preempt disease onset and development of complications (see box). Public health efforts founded on these discoveries can hopefully help to reduce the burden of type 2 diabetes and its complications in the future. Research programs such as DEPLOY—and the hard work and dedication of the participants—are an important part of making this future real for people at risk for type 2 diabetes.

DEPLOY has a strong fan in Verner: "I'm dedicated to maintaining my regime of eating healthily and exercising regularly," she says, and she is sure that DEPLOY helped point her in that direction.

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The Beneficiary of Decades of Research
Verner Thomas and the millions of other Americans who are either at high risk or already have type 2 diabetes are the beneficiaries of decades of research.

Thirty years ago there were no proven strategies to prevent type 2 diabetes or its complications, and the only treatments, now obsolete, caused dangerously low blood sugar reactions and weight gain in patients.

Today, as a result of research, diabetes is better understood, new and more effective treatments are available, and type 2 diabetes and its complications can be delayed and in some cases, even prevented. For example:

- Researchers now know that obesity is a strong risk factor for type 2 diabetes, and have a new understanding of the molecular links between obesity and insulin resistance, a condition that prevents the body from effectively using insulin.
- Risk factors other than obesity have been identified and can be targeted.
- Newly-identified diabetes genes will enhance researchers' ability to identify and intervene in those at risk.
- Based on clinical research demonstrating the health benefits of early detection and therapy, Medicare now covers testing for diabetes.
- New drug development has been aided by an NIH-supported clinical trial that validated an indicator, called hemoglobin A1c, that reflects average blood sugar control over a 2 to 3 month period.
- New oral medications that target the specific metabolic abnormalities of type 2 diabetes are available.
- The Diabetes Prevention Program (DPP) demonstrated that type 2 diabetes can be prevented or delayed in those at risk. The benefits of the DPP were seen in all ages, all racial and ethnic groups, in women with history of gestational diabetes, and in people with diabetes risk genes.
- The landmark DPP findings are being actively disseminated to the public by the National Diabetes Education Program.
- Kidney disease resulting from diabetes can now be detected earlier by standardized blood tests to estimate kidney function and monitor urine protein excretion.
- With timely laser surgery and appropriate follow-up care, people with advanced eye disease related to diabetes can reduce their risk of blindness by 90 percent.