Testimony
Before the
Committee on Appropriations
United States Senate

"Accelerating Breakthroughs: How the Special Diabetes Program Is Creating Hope for those Living with Type 1 Diabetes"

Statement of
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Chair Murray, Vice Chair Collins, and Members of the Committee, as Director of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), I thank you for your invitation to testify at this hearing on type 1 diabetes. On behalf of NIDDK and the other Institutes and Centers of the National Institutes of Health (NIH) within the U.S. Department of Health and Human Services (HHS), I am honored to be here today to update you on recent scientific advances and future research opportunities in type 1 diabetes and its complications, including research supported by the

management of the Special Diabetes Program to identify ways to overcome barriers to using new treatments and technologies. New research advances should benefit all people with type 1 diabetes, regardless of where they live, their socioeconomic status, their age, their race or ethnicity, or their

To identify these environmental components of type 1 diabetes risk, NIDDK, through the Special Diabetes Program, supports an ambitious, long-term clinical research study called TEDDY. TEDDY has screened over 425,000 newborns, enrolling 8,000 who were at high genetic risk of type 1 diabetes. These children are being followed until they are 15 years old, and they and their families have donated over 4 million biological study samples to date. The youngest TEDDY participant will turn 15 in 2025, at which point final data analyses can begin. In the meantime, the TEDDY study is generating insights made possible by analysis of the "big data" collected by such a large study. TEDDY researchers are looking at genes, proteins, and metabolites and are also studying the children's microbiomes, viromes, and environmental exposures to understand how these evolve during childhood and how they might influence disease. Analyses of these factors have yielded new insights into how the microbes in a child's gut change as they age, and how those changes are affected by breastfeeding.[6] Yet other TEDDY findings have also allowed researchers to construct a risk score tool that uses both genetic and immune factors to predict an individual's risk of type 1 diabetes. Finally, new research is also illustrating how Fvd [(i)74.f -4-1u-ndote

underlying the Control-IQ hybrid artificial pancreas system, and then later supported clinical trials demonstrating the system's effectiveness at managing blood glucose levels in both children and adults. This research helped support FDA approval of Control-IQ technology for people with type 1 diabetes who are six years old and older.[8] Further Special Diabetes Program supported research has since tested the safety and efficacy of this device in children as young as two years old.[9]

We are also looking ahead to developing the next generation of artificial pancreas systems. As mentioned earlier, the Special Diabetes Program plays a unique role in expanding our knowledge of how new glucose management technologies can benefit all with type 1 diabetes, with the goal of having multiple artificial pancreas technologies available to fit people's individual needs. An example of this is studying the use of these devices during pregnancy or in populations where managing blood glucose levels is particularly challenging, such as very young children and people with high hemoglobin A1c (HbA1c) levels (a measure of average blood glucose levels).

A recent Special Diabetes Program-supported clinical trial is a successful example of the benefits of studying advanced artificial pancreas devices in groups that are representative of the type 1 diabetes community. This trial demonstrated that the bionic pancreas device—which requires minimal user input and handles dosing decisions autonomously—improved blood glucose management for a diverse group of children and adults, keeping their blood glucose levels in a healthy range better than standard care.[10] The trial specifically sought to recruit volunteers from a variety of backgrounds, including people with lower income and education levels, those from previously underrepresented racial and ethnic groups, and people with high HbA1c levels that put them at increased risk for developing long-term complications. As a

and research into behavioral, psychosocial, and other “human” factors that affect peoples’ ability to use these new technologies. One example of the positive impact this support has had on people’s lives is the Special Diabetes Program-supported development of an improved glucagon formulation that does not require refrigeration. This research resulted in a ready-to-use rescue pen that is now commercially available to treat low blood glucose, a daily concern for people with type 1 diabetes.[12]

RESTORING BETA CELL FUNCTION

Technologies for managing type 1 diabetes are important tools for alleviating the burden of this disease, but they are not a cure. Finding a biological cure for type 1 diabetes—a way to restore the body’s ability to produce insulin and regulate blood glucose levels—is another major, long-term goal of NIDDK- and Special Diabetes Program-funded research. One approach to a cure is s

with the goals of identifying the factors that can lead to life-threatening hypoglycemic events and developing strategies to mitigate these factors and improve quality of life.

Additionally, NIDDK is supporting important efforts to improve care for another serious

whom the clinical research I described today would not be possible. The Special Diabetes Program has catalyzed remarkable progress in type 1 diabetes research and has ushered in a new era where individuals with type 1 diabetes have significantly improved health, longevity, and, importantly, quality of life. We have shown for the first time that type 1 diabetes can be delayed and NIH remains steadfast in our goals of preventing, treating, and ultimately curing type 1 diabetes. With continued research, we hope to move even closer to the day that all people can be free from the burden of type 1 diabetes and its complications.