Title: Exploring the effects of ketogenic diets on type 2 diabetes

Researchers:

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Research area: Type 2 diabetes

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Summary:

Purpose: Diabetes occurs because of defects in insulin production in the islets of the pancreas. Recent evidence suggests that ketogenic (high-fat, low-carb) diets can be used to treat type 2 diabetes; however, the effects of these diets on the islets, and whether they actually affect insulin production, are unknown. Our research will evaluate the short- and longterm impacts of consuming a ketogenic diet to treat type 2 diabetes, which will inform on their safety.

Methods/Procedure: We will measure the impacts of a ketogenic diet using islets from both humans (obtained through organ donation) and mice with type 2 diabetes. The islets will be cultured in dishes with different components of the ketogenic diet. We can feed our mice very specific diets with controlled nutrient content for short-term and long-term studies. We will examine both sexes in all our studies. This research will allow us to directly examine the pancreas and islets to test if ketogenic diets improve their function or cause further deterioration.

Outcome: This research will determine if it is safe for patients to use ketogenic diets to treat type 2 diabetes.

Relevance to people affected by diabetes: Ketogenic diets can reduce and stabilize blood sugars, but we do not know if they also correct the insufficient insulin secretion that causes type 2 diabetes. This research will either provide patients with the confidence to practice ketogenic diets for their beneficial effects or identify concerns with these diets. In that case, the research will inform caregivers and patients on those concerns and how they can be monitored.

Engagement: We have recruited a very engaged Patient Partner who has diabetes and received cardiac care treatment at UOHI who is interested in being informed and engaged in research. We plan to meet every 6–9 weeks. Together, we will ensure meaningful communication of the results to caregivers and patients through podcasts, media engagement, and lay language summaries.