Sweet! - Integrating Glucose and Ketone Testing To Improve Efficiency in the Treatment of Diabetes

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Diabetes Mellitus is a prevalent autoimmune disease that results in a deficiency of insulin produced by the pancreas. Technological advancements with innovative testing and treatment methods have improved the livelihood of diabetics who can afford it. Testing vitals such as glucose levels and ketones are imperative in the well-being of diabetics, yet counterintuitively, they are separately detected. Integrating a test strip that can simultaneously provide accurate readings of both vitals would be a critical step forward in the continued advancements of diabetes treatment. This innovation would change the global definition of diabetes management and provide families with a higher degree of security. This project focuses on the positive health impact hypothesized and the creative process with the electrochemistry inside the innovated test strip and sensor. Originally planned to be built as a prototype, an unexpected COVID-19 case derailed the acquiring of crucial materials, halting construction. An improvised procedure saw detailed designs and research conducted instead. A final design was completed, proving through analytical observation that the product would be offering much-needed insight into the integration of glucose and ketone testing in the diabetes treatment world. The proposed integrated system is a solution to the issue of efficient detection with a design that incorporates both electrochemical aspects without contamination of either process. After conducting a study with rigorous research, it was concluded that the design could revolutionize the treatment and testing of diabetes, preventing severe hyperglycemic events.

Awards Won: