

INFRASTRUCTURE

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THE TECHNOLOGICAL INFRASTRUCTURE REQUIRED TO SUPPORT THE KIDIABAND

To understand how the Kidiaband's sensors help children with diabetes, it is first necessary to know a little bit about diabetes and its treatment. Diabetes mellitus is a condition in which the pancreas does not produce enough insulin, which is a substance that helps cells absorb glucose. Untreated diabetes can result in lethargy, weight loss, and unusual hunger and thirst. The type of diabetes most frequently occurring in children, Type 1 diabetes, is usually managed through a careful diet and daily insulin injections (Edgren and Wells).

Since the mid-1990s, researchers have been working on developing sensors that measure the concentration of certain substances in sweat excretions. As early as 1999, there existed both long

-term patches that, after being worn and collecting sweat for five to ten days, could be tested in laboratories for the presence of illegal drugs, and so-called "fast patches" that accomplished the same result in a shorter amount of time by stimulating sweat production through heat (Huestis et. al. 247).

In 2011, researchers at the University of Oslo and the National Hospital of Norway created a "sweat meter" that, instead of simply collecting samples for laboratory analysis, provided real-time feedback by attaching an electrode to a patient's skin and sending text message alerts when blood sugar was low. At that point in time, the sensor was not ready for commercial sale (Vogt). However, over time, it will become more precise

and less expensive. If children with type 1 diabetes receive alerts when their blood sugar is high or low, they can self-treat by either taking insulin or snacking as necessary.

The technological infrastructure required for the Kidiaband includes both commercial access to inexpensive, accurate sweat monitoring and to a cell phone on a network with good coverage, as the Kidiaband sends text alerts and data on glucose levels to an app on the child's guardian's and/or teacher's phone.

JUNE 10, 2014

THE SHORT VERSION:

- Type 1 diabetes is usually managed via diet and insulin injections
- Researchers have been working on sweat sensors since the mid-1990s
- In 2011, a sweat meter measuring glucose levels was invented
- If children receive alerts when their glucose levels are high or low, they can self-treat
- Infrastructure required to support the Kidiaband includes sweat sensors and cell networks

