

SugarSafe Band

Tong Award Executive Summary

Claudia Beckwith, Lauren Klein, Isabel Ploessl

The SugarSafe band is designed to improve communication of blood glucose status between children with Type 1 Diabetes (T1D) and their caregivers. Although continuous glucose monitors (CGMs) provide accurate glucose data, those readings are often displayed on a personal device and are not immediately visible to parents, teachers, coaches, or others supervising a T1D child. This creates a communication gap in situations where rapid recognition and action is critical. Clinical guidelines emphasize the need for close caregiver supervision throughout childhood and often into adolescence, as children gradually develop the skills needed for independent management. According to the 2025 publication, *Diabetes in America*, T1D affects approximately 364,000 children under 20 in the United States (US). An estimated 80% of this population is currently using a CGM to manage their T1D. The burden extends beyond the child, as studies show that pediatric T1D can be equally as stressful for parents as the child themselves, with an average of 81% of parents reporting distress following initial diagnosis, according to MDPI in 2025, highlighting the need for more accessible, real-time communication tools.

The target population for the SugarSafe band includes T1D children and the network of parents, teachers, and caregivers responsible for their care, striving to reduce stress and improve treatment efficiency. Pediatric patients represent a particularly meaningful market due to their limited ability to independently recognize or communicate symptoms, and caregivers are highly motivated to adopt tools that provide reassurance when direct monitoring is not possible. Approximately 295,000 youth in America currently use CGMs, representing a substantial market. 5% of market adoption represents 15,000 users in the US. If commercialized, the band has the opportunity to dramatically improve safety, reduce stress, and build intuition surrounding CGM interpretation to users and caregivers alike.

The SugarSafe band features an iOS application that retrieves real-time glucose values from a Dexcom account and transmits it via Bluetooth Low Energy connection to a wrist-worn device. The adjustable band provides a secure fit around a child's wrist and emits a color-coded LED light signal corresponding to low, high, and in-range glucose levels, allowing caregivers to interpret blood glucose levels at a glance without the need for a phone. The band also features visual cues for when the signal is lost to prevent the display of stale data, and adjustable brightness to accommodate a variety of environments.

The SugarSafe band was validated on accuracy of updates and ease of color differentiation at varying distances. Testing showed that both the developed app and band displayed correct updates with 100% accuracy when operating within range. In addition, color differentiation and visibility were successfully demonstrated at distances up to 161 meters, indicating that the display can be interpreted from farther than the width of a standard playground. Activity testing also confirmed the band stays securely in place during movement. Due to promising results in testing and the existing market gap, the SugarSafe offers a meaningful and actionable solution to an unmet need in pediatric diabetes care.

There are two primary competitors on the market that also utilize a display to communicate blood glucose levels. The *Glowcose* smart light, a wired desktop device, uses colors like orange and red values to denote hypoglycemia, blue to purple to denote hyperglycemia, and green to show in-range. While this product makes it easy to understand values at a glance, it does not offer any degree of portability and requires constant Wi-Fi connection. Apple Watches are also commonly used for portable and direct monitoring of CGM data, however, they do not provide any external or easily visible indication of blood glucose levels to caregivers.

Our mission is to reduce the daily burden of T1D, by giving families more confidence in the treatment of their child. SugarSafe gives families more time to focus on life, not just diabetes.