

Poster

Mobile Insulin Dosing System Formative Study

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Abstract

Background: Titrating long acting insulin is a significant challenge for physicians and patients. The most advanced method is a paper titration form, which is often error prone, especially if the patient has low numeracy skills. The limitations of the paper titration form can be mitigated by using a smartphone-based, mobile insulin dosing system (MIDS). Reducing barriers to insulin therapy, including dosing and titration, can empower clinicians and patients to achieve glycemic control.

Objective: The objective of this human factor formative study was to obtain feedback, from healthcare providers (HCPs) and insulin-treated patients with type 2 diabetes, on a prototype of a MIDS. MIDS consists of an easy to setup patient instruction form (PIF), configured by HCPs, and easy to understand mobile prompts and reminders for patients to assist with self-adjustment of their insulin dose. The MIDS will use patients' fasting blood glucose (BG) readings, synced from their glucose meter using Glooko, for insulin dose calculations. Clinicians can monitor patients' progress via Glooko's Web-based user interface.

Methods: A total of 15 HCPs, including 7 certified diabetes educators, 2 primary care physicians, 1 pharmacist, 1 medical informatics leader, and 4 endocrinologists, as well as 4 patients with type 2 diabetes and 1 patient with hemochromatotic diabetes, on insulin therapy, were interviewed. The structured one-on-one interviews lasted 60 minutes and were conducted in person or virtually. During the structured interview, a discussion guide was used to pose questions in a specific order. The order of questions was determined by the order of screenshots in the Web-based patient instruction form and mobile messages received by patients. Probing questions were asked to evaluate the reasons behind the responses.

Results: All of the HCPs interviewed stated that the ability to share an insulin titration template with colleagues and a mobile insulin dosing for patients were valuable. Other findings include the following: 80% of HCPs use age and weight to determine starting insulin dose; about 70% of HCPs would set up reminders in the application to instruct their patients to test fasting BG and administer insulin at specific times; and all HCPs wanted patients to be alerted to contact their physician if their fasting BG reading was beyond the provider-set hypoglycemic or hyperglycemic threshold. Findings from patient interviews include the following: 75% of the participants said that they would not get reminder fatigue but wanted the ability to edit or dismiss the reminders; 80% of the participants wanted the ability to pause the MIDS program and let the program provide them prompts and reminders even when they were within their target fasting BG range; and all of the patients stated that being able to see their dose adjustment history was helpful.

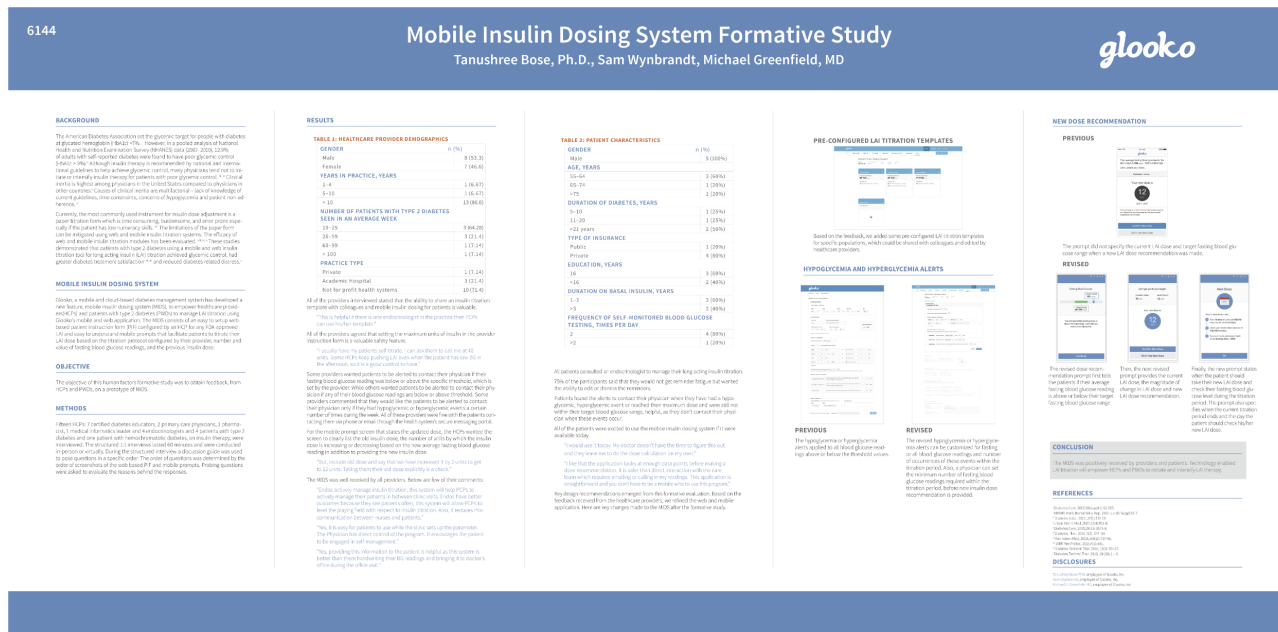
Conclusions: Key design recommendations emerged from this formative evaluation. Based on feedback received from the HCPs and patients, the reminders setting will be refined. Results led to improvements and optimization of the MIDS and supports further development of MIDS as a mobile system that helps with basal insulin dose titration was positively received by providers and patients.

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type 2 diabetes; insulin titration; remote monitoring; long acting insulin; basal insulin; patient centered

This poster was presented at the Connected Health Symposium 2016, October 20-21, Boston, MA, United States. The poster is displayed as an image in [Figure 1](#) and as a PDF in [Multimedia Appendix 1](#).

Figure 1. Poster.



Poster.

[PDF File (Adobe PDF File), 653KB-Multimedia Appendix 1]

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