ABSTRACT
A simple, affordable and dishwasher friendly device was developed in order to address an existing difficulty that diabetics who are blind or visually impaired face when attempting to independently use a glucometer: namely, the effective transfer of blood onto the test strip.

INTRODUCTION
Poorly managed diabetes may result in diabetic retinopathy which causes gradual loss of an individual’s visual field. Current glucometers with synthesized speech can inform these users of the results, but individuals who are blind or visually impaired still cannot often successfully coordinate transferring blood to the test strip without excessive blood drawing or assistance.

THE DEVICE
Our device was prototyped in ABS plastic using a 3D printer, and can be fabricated in bulk using injection molding. It was made to fit with the Prodigy Voice glucometer recommended by clinicians for individuals who are blind and visually impaired, although it can be easily adapted to other glucometers as well.

With our device, the task of transferring blood to a test strip is reduced to one wrist rotation guided by haptic cues inside the cylindrical section where the finger is placed. The cylindrical section is constructed so that any part of the finger can be used (from distal to proximal locations, and at any rotation of the finger) with any of the user’s fingers.

GLUCOMETER HAPTIC GUIDE: DIAGRAM
A: Opening for finger
B: Window (top) - where the lancing occurs
C: Window (bottom) - where the blood meets the strip
D: Compartment for glucometer
E: Haptic cues provide guidance during rotation

TASK BREAK DOWN
1. User inserts a test strip with the glucometer already secured into the device
2. User places finger inside cylindrical section
3. User pricks finger at desired location via the window on the top face of the cylindrical section.
4. User rotates their finger along the inside of the cylindrical section with the prick site travelling down the open window.
5. The bead of blood makes contact with the test strip, which is always position at the bottom of the window.
6. The glucometer records and speaks the results to the

ASSESSMENT STUDY
Measures of Assessment: cf. to normal use (without our device)
- The number of test strips used per test
- The number of finger pricks used per test
- Stress, Anger and, Frustration levels during testing
24 participants
- Currently recruiting in the Virginia-DC area.

PROJECT EXTENSIONS
Optical Character Recognition (OCR) and vibrotactile feedback from a smart phone could make our device further accessible to individuals who are deaf-blind.

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