

Accessibility Attributes of Blood Glucose Meter and Home Blood Pressure Monitor Displays for Visually Impaired Persons

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Abstract

The vast majority of diabetes-related self-management technology utilizes small visual displays (SVDs) that often produce a low level of contrast and suffer from high levels of reflection (glare). This is a major accessibility issue for the 3.5 million Americans with diabetes who have reduced vision. The purpose of this article is to gather comparative data on the key display attributes of the SVDs used in blood glucose meters (BGMs) and home blood pressure monitors (HBPMs) on the market today and determine which displays offer the best prospect for being accessible to people with reduced vision.

Nine BGMs and eight HBPMs were identified for this study on the basis of amount of devices sold, full-functionality speech output, and advanced display technologies. An optical instrumentation system obtained contrast, reflection (glare), and font height measurements for all 17 displays.

The contrast, reflection, and font-height values for the BGMs and HBPMs varied greatly between models. The Michelson contrast values for the BGMs ranged from 11% to 98% and font heights ranged 0.39–1.00 in. for the measurement results. The HBPMs had Michelson contrast values ranging 55–96% and font height ranging 0.28–0.94 in. for the measurement results.

Due largely to the lack of display design standards for the technical requirements of SVDs, there is tremendous variability in the quality and readability of BGM and HBPM displays. There were two BGMs and one HBPM that exhibited high-contrast values and large font heights, but most of the devices exhibited either poor contrast or exceptionally high reflection.

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Abbreviations: (APH) American Printing House for the Blind, (BGM) blood glucose meter, (HBPM) home blood pressure monitor, (LCD) liquid crystal display, (OLED) organic light emitting diode, (SVD) small visual display

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