Design of a Colorblind-Friendly Patient Safety Dashboard

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Introduction/Background

Adverse medical events are an ongoing public health concern, with recent studies listing preventable harms as the cause of death for approximately 200,000-400,000 patients in the U.S. yearly[1]. As part of the Patient Safety Learning Lab study (PSLL), our research team created an interactive safety dashboard that is integrated into the electronic health record (EHR). This dashboard compiles data on various safety categories in real-time, and draws from clinical documentation completed by doctors, nurses, and other members of the clinical team[2]. The current version of the dashboard utilizes a color-coded system of red, yellow, green and gray to differentiate between four levels of alerts. Given this color scheme, red-green colorblind users will struggle to use the information as presented.

Methods

To address this issue, small yet substantial revisions in design were devised to assist users in better distinguishing between flags. This was in response to feedback that was suggested during the pilot phase of the study, stating that colorblind users would currently find this tool ineffective. The approved colorblind-friendly mockup (**Figure 1**) is based on the iterative refinement of earlier rough drafts, which were all formed from the initial input of the PSLL research team members. This specific mockup was chosen because it presented the lowest level of cognitive burden to users; it also allowed for the simultaneous enhancement of an existing functionality with red and yellow flags, where users can check the flag to indicate that they are aware of an increased patient safety risk.

Results

The current version of the dashboard and the colorblind-friendly mockup are shown below. All mockups were analyzed through software that simulates colorblind vision, and were first vetted by a colorblind Brigham and Women's provider as well as a human factors expert before being presented to the larger research team.

Figure 1: Current unit-level view of the patient safety dashboard (left) and colorblind-friendly mockup (right).

Discussion/Conclusion

Aligning with the user-centered design that inspired the creation of the dashboard, it is imperative that all dashboard users are properly accommodated. These revisions allow colorblind users to easily distinguish between different flag types, while preventing an increased cognitive burden by maintaining the overall color scheme. Though a seemingly small change, this new design is expected to increase accessibility of the dashboard by incorporating a larger pool of users and facilitate its spread to other hospital institutions.

References

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