Development of a web-based smartphone app: a sustainable measure to enable accessibility of pathway details

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Background

Included amongst the many challenging aspects to management of a large, multidisciplinary Enhanced Recovery After Surgery (ERAS) program at an academic medical center is accessibility to pathway information to ensure compliance. ERAS pathways should be readily available for reference in a variety of geographic locations for all team members including surgery, anesthesiology, and nursing staff. Many institutions utilize an online, secure database repository that requires the end user to access a website, login, and click through several screens to find pathway-specific information. This could lead to user frustration or confusion, which might decrease buy-in and compliance with pathway elements. We sought to develop a smartphone app providing streamlined elements of each active pathway that can be accessed easily and quickly from anywhere that has Wi-Fi access. We offered this app as an alternative to options already available to our department, which included some less readily available formats such as a password-protected database containing PDFs of the full pathways accessible via computer and e-mails containing pathway details sent to the anesthesia care teams the day before ERAS cases.

Methods

Two commercial developers specializing in apps for ERAS programs were found by word-of-mouth and a Google search. Initial quotes were deemed too expensive (range: $25,000-$90,000) to be cost-effective for our program. The high initial costs, along with contracts requiring yearly maintenance fees (maximum: $10,000), was not sustainable, and the apps contained features that were more complex than those needed to address our main need for improving pathway accessibility. Our department's IT division created a simple webpage-based pathway repository that met all of our desired features including (i) custom display of pathway elements, (ii) ease of navigation, (iii) minimal user log-ins, and (iv) easy maintenance. A unique icon was created for the webpage so that it appears as a discrete app to the end user on their smartphone. Six months after the launch of the app, an optional and anonymous survey was administered to anesthesiologists, residents, and CRNAs in the department who managed ERAS cases since the time the app has been active.

Results

The internal department app was introduced in August 2016 and supports seven different ERAS pathways, with the option to easily add new pathways as the program expands. The

app is available to all 79 attending anesthesiologists, 87 CRNAs, and 55 resident physicians in the department. Internal set-up required 160 man-hours and necessitates an average of 3 hours of in-kind work per month for ongoing support. Responses (n=40) to the usage survey revealed that 63% (n=25/40) find the app easy to use, 25% (n=10/40) are undecided on ease of use, and the remaining 13% (n=5/40) did not find the app easy to use. 28% (n=11/40) of respondents report using the app at some point while managing their cases in the OR, 43% (n=17/40) use the app when reviewing their ERAS cases the day before, and 43% (n=17/40) use the app as a general reference. Only 38% (n=15/40) reported not using the app at all. A common reason for not using the app was a stated preference to access the pathways using one of the two original methods.

Conclusions

The development of an internal webpage smartphone app allows perioperative clinicians to access pathway details quickly and from a variety of locations. The internal webpage app saved external costs by not relying on externally-hosted commercial apps, and provides a low-maintenance solution to an accessibility issue. Areas of future research include investigating the impact of this technology on compliance with ERAS pathway elements.