Executive Summary of the Assessing Surgical Site Infection Surveillance Technologies (ASSIST) Project

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Abstract

Background: The expert panel that conducted the Assessing Surgical Site Infection Surveillance Technologies (ASSIST) project elaborates on the key findings of the health technologies assessment (HTA) report in a series of articles addressing topics from workflow challenges to implementation strategies to new big data analytics tailored to incorporate serial patient-generated health data (PGHD).

Conclusion: By reporting on the methodology, with an emphasis on stakeholder engagement, the ASSIST investigators provide the basis for a future deep dive into the next phase of PGHD integration into surgical site infection (SSI) surveillance.

Keywords: surgical wound infection; mobile health; patient generated health data; smartphone; postoperative care; technology assessment

The adoption of smartphones, texting, and patient portals for post-operative care coordination present both challenges and opportunities to the surgeon. Real-time communications that were once the fantasy of Dick Tracy and Star Trek are now second nature to digital natives, who bring their own devices to healthcare with the expectation that providers will review patient-generated health data (PGHD) and engage via new communication channels. It is now possible to offer expanded, personalized care to patients after surgery, using new data streams and data types via mobile devices to facilitate remote patient monitoring. One of the most compelling use cases for post-operative mobile health (mHealth) tracking is the triage of surgical sites for evidence of surgical site infection (SSI) through review of serial incision photography and symptom reporting.

Although the current standard of care for SSI diagnosis requires in-person physical examination of the surgical site, patient-generated photographs are increasingly submitted to and reviewed by surgical providers via e-mail, text messaging, and electronic health record-based patient portals. Although the current use of telemedicine for post-discharge surgical care has been reviewed systematically, the specific use of mHealth for SSI surveillance and the process of work associated with this activity is highly variable and generally unacknowledged in the medical literature. In September 2017, the Safety and Healthcare Epidemiology Prevention Research Development (SHEPHeRD) program [1] from the U.S. Centers for Disease Control and Prevention (CDC) awarded the University of Washington the opportunity to conduct the Assessing Surgical Site Infection Surveillance Technologies (ASSIST) project aimed at the evaluation of the current use of PGHD and mobile devices in post-operative SSI surveillance. The purpose of the project was to conduct a health technology assessment (HTA) of the state of the science of using mHealth for SSI care, and to make recommendations to the CDC for further work to facilitate the integration of PGHD into the standards for SSI detection and surveillance.

In year one, the ASSIST investigators completed a literature review and a landscape analysis of apps directed specifically at post-operative incision monitoring. Through this initial work, the group also developed a network of stakeholders (researchers, patients, clinicians, administrators, and health information technologists among them) and conducted key informant interviews to gain additional perspective on real-world use. Although the current standard of care for SSI diagnosis requires in-person physical examination of the surgical site, patient-generated photographs are increasingly submitted to and reviewed by surgical providers via e-mail, text messaging, and electronic health record-based patient portals. Although the current use of telemedicine for post-discharge surgical care has been reviewed systematically, the specific use of mHealth for SSI surveillance and the process of work associated with this activity is highly variable and generally unacknowledged in the medical literature. In September 2017, the Safety and Healthcare Epidemiology Prevention Research Development (SHEPHeRD) program [1] from the U.S. Centers for Disease Control and Prevention (CDC) awarded the University of Washington the opportunity to conduct the Assessing Surgical Site Infection Surveillance Technologies (ASSIST) project aimed at the evaluation of the current use of PGHD and mobile devices in post-operative SSI surveillance. The purpose of the project was to conduct a health technology assessment (HTA) of the state of the science of using mHealth for SSI care, and to make recommendations to the CDC for further work to facilitate the integration of PGHD into the standards for SSI detection and surveillance.

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knowledge, advise best practice in the application of mHealth for SSI surveillance (listed in Table 1). A draft report was completed in January 2019 and disseminated online for public comment, and the final version of the report submitted to the CDC in May 2019 [3].

In this special issue of Surgical Infections, the expert panel that conducted the ASSIST project elaborates on the key findings of the HTA report in a series of articles addressing topics from workflow challenges to implementation strategies to new big data analytics tailored to incorporate serial PGHD. Acknowledging the rapid development cycle used in design and deployment of mHealth apps, the ASSIST investigators concede that any report from a defined period of time can best be regarded as a biopsy, as the field continues to grow unabated. Even since the conclusion of the project, new clinical trials of mHealth apps for post-operative care have been presented [4] and published [5], and a current study in Europe focusing on time to SSI detection should complete enrollment this summer [6].

The number of mHealth apps increases exponentially each year, and as new apps emerge, older ones may mature and expand or regress into the past with little usage or impact on patient care. Furthermore, some of the apps reviewed may never advance to commercialization, remaining research endeavors for their whole lifespan. But these orphan apps have value, in that the process of development, the features contained, and the implementation trials all frame lessons for future app design, integration and dissemination. Additionally, the data collected can serve as fuel to drive innovation in analytic methods and to incorporate PGHD, especially incision images, into the clinical and surveillance definition standards for SSI. Finally, by reporting on the methodology, with an emphasis on stakeholder engagement, the ASSIST investigators provide the basis for a future deep dive into the next phase of PGHD integration into SSI surveillance.

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