Improving Communication from the Operating Room: A New Mobile Application to Enhance the Family Experience

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How Orlando Health’s new mobile app resulted in a 98% reduced anxiety rate for patients and their families in the waiting room.
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Clinicians at Orlando Health Arnold Palmer Hospital for Children developed a mobile application to provide real-time updates of surgical procedures to families in the waiting room. Surveys of patient families show improvements in patient experience, while nurses surveyed preferred the app over a phone call to families.

**Key Takeaways**

1. The use of a mobile application to communicate in real-time from the operating room enhances the family experience and improves satisfaction.

2. Physicians and nurses report that this method of updating the family is more efficient, reliable, valuable, and enjoyable than the traditional phone call.

3. Communication is a vital component of the health care experience, and the surgical operating room has often lagged behind other areas in keeping families informed.

4. The utilization of real-time text and visual updates with mobile technology is an efficient and effective tool that has been embraced by physicians, nurses, patients, and their families.
5. Successful adoption and implementation of electronic communication requires a cultural change within an organization. Buy-in from executive administration, the legal office, the compliance office, and medical leadership is necessary.

6. Adoption and implementation of innovations in health care can follow a phased process that identifies innovators to test the process and then allows expansion to occur organically.

7. Providing enhanced communication has been shown to improve the patient experience and increase satisfaction scores and other valuable metrics.

The Challenge

Electronic communication offers a means of keeping patients and families connected and informed. At the same time, a report entitled “Text Messaging and Protected Health Information. What Is Permitted?” emphasizes the appropriate use of email, texting, and other forms of communication in medicine, and highlights the importance of maintaining HIPAA compliance in order to protect private health information (PHI).

The Goal

In 2012, a clinical and technical team at Arnold Palmer Hospital for Children, part of Orlando Health, began a quest to bring modern communication via text, pictures, and videos, sent in real-time, directly from the operating room to family members in that waiting room. We set out to design a mobile application that would be easy to use — both by those sending the messages and those receiving them — and that would send information securely, conforming to stringent HIPAA regulations.
Ultimately, we created a communications platform called EASE: Electronic Access to Surgical Events.

**The Execution and the Team**

*Preliminary Research*

A thorough and detailed understanding of HIPAA regulations and hospital compliance was necessary. After extensive research and in collaboration with the Legal and Compliance departments, we were able to formulate a corporate security plan that outlined not only how we would maintain compliance, but also the steps we would take should a data breach occur. We undertook a pilot study of 50 patient families and collected data from both the nursing and physician staff sending the messages, and the families receiving them. This gave us valuable insight as to the type of messages (i.e., texts, pictures, and/or videos), frequency of updating, and content of information that all parties were comfortable with.

*App Design*

The design phase of the mobile application was conducted in conjunction with our technical team. We worked off a few basic assumptions: that most people are familiar with downloading apps to their mobile devices, that most people know how to send and receive texts, and that nurses are familiar with barcode scanning. Essentially, the app had to be easy to use with an attractive user interface and incorporate certain features based on feedback and data from our pilot. Important security features included 256-bit encryption, no storage of any communications on mobile devices, secure cloud-based storage, individual sign-on and password protection, and all content disappearing after 60 seconds of viewing.
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responsible of a busy operating room, drawn from our clinical experience, were also key in the design. Two separate apps were created: one for the clinical staff sending messages, and one for the family receiving them.

For the nurses sending messages, log-in and connection to the family needed to be quick and easy. Vital to the protection of PHI was ensuring that messages could not be inadvertently sent to the wrong family. This was achieved by requiring that a patient’s hospital-issued wristband bar code was scanned prior to sending messages, a process that nurses are already familiar with. To keep nurses engaged and mindful of updating, an audible notification was set up to sound every 30 minutes during procedures. This was also the preferred update interval desired by families, as determined by our pilot data.

To improve efficiency, and to be able to communicate to those who don’t speak English, 25 optional ready-made phrases in English and Spanish were incorporated into the app.

For the family app, we designed a simple registration and consent process. Additional family and friends can be invited to receive messages, enabling those who could not make it to the hospital to receive the updates.

We wanted to be able to collect data regarding the families’ experience, so a voluntary post-surgical survey was designed and embedded in the app.

Implementation

Our strategy for adoption followed the path prescribed by Diffusion of Innovation theory.
We believed that the successful implementation of this initiative would require voluntary participation at first, so we identified the surgeons who were “innovators” and asked them to trial the app. As we gathered data from families, and as the operating personnel became comfortable with this new mode of communication, we were able to expand the program to “early adopters” and beyond. The program was first rolled out in the pediatric cardiac subspecialty on procedures lasting over an hour, and quickly spread to orthopedic surgery, plastic surgery, and neurosurgery.

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As time went on, enrollment of surgeons accelerated, and we refined the sign-up process to involve the preoperative staff. Consent forms were simplified, and the hospital launched an internal marketing campaign to increase awareness with brochures, tent cards, and digital
signage. As usage of EASE approached 15% to 20% of the daily OR cases, families began to request the program after hearing about it through internal hospital marketing, from nursing staff or surgeons, or word of mouth from other families. Adoption increased rapidly to include not only every surgical specialty, but also all but the shortest of procedures. We viewed this as our “tipping point”.

EASE expanded from the Orlando Health children’s hospital to the six adult hospital campuses following a similar strategy, beginning in the adult cardiac operating rooms, which are small, cohesive OR teams with innovative surgeons and longer surgeries. Implementation has proven to be slower but equally successful in our adult campuses. We believe the slower adoption is a consequence of a larger, busier, and more diverse surgical area.

Training

Most clinicians are familiar with mobile technology, but most are unfamiliar with what constitutes suitable content using this new form of communication from an OR. We produced training material that was mandatory to view before a new sender would be granted log-on privileges. A short video detailed how the app functioned, provided guidance on appropriate content, cautioned against inappropriate content, and showed examples for the various surgical specialties. In addition, we provided a short guide with suggested text phrasing and picture/video content.

Some surgeons and nursing leaders initially preferred to use scripted updates, but once they became comfortable with the app, the messages tended to become less scripted and more personalized.

Metrics

HCAHPS Scores
Our health system retrospectively analyzed nine questions from Press Ganey surveys that pertained to patient experience and staff communication. They compared the responses of those families who had used the EASE program during their surgery to those who did not.

Over 3,000 responses were analyzed. All scores for those families who used EASE rose, varying from 2.3% to 13% with an average increase of 6% for all nine questions.

Additional analysis of the results found that scores were even higher among those families who received pictures and videos in addition to text messages, as opposed to those who only received text updates. Families said that the images and videos helped them understand the medical process better and that they felt more connected to their loved ones during the surgical process.

Patient Satisfaction Scores Improvement from Use of EASE

Source: Press Ganey surveys for Orlando Health
NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society
In-app Survey

The in-app survey asked four questions. Responses from over 2,500 patient families were strongly positive:

1. EASE reduced their anxiety: 98% yes
2. Nature of the images received was appropriate: 99% yes
3. The availability of EASE would influence your choice of hospital: 81% yes
4. Satisfaction score (1 = very dissatisfied; 10 = very satisfied): 9.7 average score
Nursing Survey

Following a 6-month trial period, we surveyed 26 nurses who had used the app to update families from the operating room. They strongly favored EASE over the traditional phone call (on the 1–5 survey scale, 5 indicates “strongly agree”).

- Better than a phone call: 4.3
- More reliable: 4.1
- More efficient: 4.6
- Not disruptive: 4.3
- Valuable to the family: 4.9
- Enjoyable: 4.5