

**Boston Children's Hospital:
Technology for Patient Care**



Summary

Pediatric inpatient hospital stays are overwhelming not just for children but for parents as well. Parents of children hospitalized for acute illnesses experience high levels of stress and anxiety,¹ which are exacerbated by the hospital environment. Staff shift changes, brief check-ins during rounds, background noise and visual distractions from medical equipment² all worsen a parent's ability to recall vital health information provided to them by their child's care team.³

To increase understanding of after-care instructions, parents often receive written or printed instructions once their child is discharged. While 70-80 percent report that they fully understand the printed instructions,⁴ only 15 percent felt they could explain their child's treatment and discharge instructions to someone else,⁵ and more than 25 percent did not follow through with prescribed medications.⁶ Approximately 50 percent of pediatric hospital readmissions were determined to be preventable if communication measures were improved with the parent both during the child's original hospital stay and upon discharge.⁷

Seeing an opportunity to reduce readmissions and improve patient outcomes the Research and Innovation team at Boston Children's Hospital developed digital tools to improve communication with parents both during and after their child's hospital stay.

¹ <http://pediatrics.aappublications.org/content/115/6/1536.short>

² <http://www.sciencedirect.com/science/article/pii/S0003687014000878>

³ <http://www.tandfonline.com/doi/abs/10.3109/14992027.2012.721014?src=recsys&journalCode=iija20>

⁴ <https://www.ima.org.il/filesupload/imag/0/54/27211.pdf>

⁵ <https://hosppeds.aappublications.org/content/6/8/449>

⁶ http://journals.lww.com/pec-online/Abstract/2015/06000/Compliance_of_Medications_Prescribed_From_a.3.aspx

⁷ <http://pediatrics.aappublications.org/content/early/2016/07/20/peds.2016-1643>

Context

MyStay is a downloadable app designed to guide parents during their child's hospital stay, and DisCo, a text- and email-based tool, offers support after discharge.

An inpatient hospital stay can be an overwhelming experience for the patient and family due to the large number of clinical staff and volumes of health information that they are expected to manage during a potentially emotional and stressful time. Interactions between patients, families, and providers during rounds or nursing check-ins can be brief, and thus, families may have difficulty recalling the names of their providers, their questions for the care team, and the information shared by the care team. These challenges may be magnified if there are additional communication issues, such as language barriers between the family and the care team.

In addition, the transition from inpatient care to home may require some additional assistance for some patients. Prior to leaving the hospital, a patient and family are provided with discharge instructions, which may include prescriptions, home care instructions, and recommendations for follow-up appointments. Some patients may have difficulty the completing the discharge instructions or may develop complications; therefore, many hospitals have a member of the nursing staff follow-up with patients following discharge. The team at the Boston Children's Innovation Center developed novel tools and workflows to support patients and their families from the inpatient stay through the transition home.

Boston Children's Hospital is a tertiary care, academic pediatric hospital serving the Boston area, as well as many out-of-state and

Description

international patients. Boston Children's Innovation Center supports projects and innovations in digital health strategy. The Innovation Center team has expertise in software development, data analytics, clinical care and lean startup practices, with a current focus on innovation for population health, telehealth, and consumer devices.

Two digital tools called MyStay and DisCo (Discharge Communications) were developed by Boston Children's Hospital team to address challenges in communication during an inpatient stay and the transition home.

MyStay (formerly known as MyPassport) is a mobile application that includes information on all members of the care team, an inpatient care plan, test results and reports, and a secure messaging system between patients, their caregivers, and the care team. At any time, patients and families can use MyStay to see their providers' names, pictures, and role on the care team, which can help families build relationships with the providers by name. MyStay also includes a care plan, with transparent benchmarks for the patient to meet before discharge. Test results are displayed in real-time with color-coding to ease interpretation. Patients and families are also able to send the care team questions at any time and providers can respond via the app or at the next in-person visit with the patient. MyStay was designed to work in conjunction with the patient portal system at Boston Children's. Patients use the same log-in credentials and access the same information as the patient portal system, creating continuity through the transition from hospital to home.

Impact

DisCo is a text and email-based tool for following a patient's care after discharge from the hospital. Patients and families can enroll in DisCo at discharge and specify a preferred method of communication. Clinical teams then customize the schedule for the patient's next appointments and instructions at discharge and establish a detailed list of future question prompts such as, "Do you need to schedule your next appointment?" and "Do you have your child's medications?" Based on the patient and family's responses, the DisCo system will notify the providers, intervening to create a direct path for additional assistance during the critical window following discharge from a hospital stay.

MyStay. MyStay users learn about the care team and their child's care plan and progress, helping them participate in conversations about care in a more meaningful way. Parents have direct access to test results and treatment goals through MyStay, which then allows for specific, clarifying questions and unified goal setting at the next care appointment. For families requiring a translator or where English is a second language, MyStay creates more time to process the information shared by the care team and creates a way to document initial questions or reactions in any language to provoke a more fulfilling discussion about the patient's care. During pilot testing, MyStay users reported high-levels of satisfaction with the MyStay app because it helped them understand more about their child's care and enabled them to take a more active role in the care process.

DisCo. In a survey of DisCo users, families reported the app was very helpful in keeping them connected to their providers and ensuring a

smooth transition from hospital to home. The discharge nurse identifies potential problems in the patient's discharge care using DisCo and act through the app to address the patient's concerns or connect the family to a specialist. In a pilot study of DisCo users, five percent of participants required some assistance with a post-discharge issue, such as new or worsening symptoms, medication questions, or scheduling assistance for a follow up appointment and 99 percent of users stated the app was helpful.⁸ DisCo has been expanded to four clinical services since its launch in 2013.

Lessons Learned

Patient participation with novel technology depends, in part, on ease of enrollment and use. Initially, MyStay was available on tablets owned by Boston Children's Hospital, but not the users' own devices which significantly limited enrollment and use of the app. Nurses could enroll only a few patients, rather than the entire floor, and had to prioritize which cases were best matched for the tablets. Once it could be installed on the devices of patients and their families directly, the clinical team and developers worked to create ways to inform patients and their families about MyStay and encourage them to participate. Developers then created a single sign-on for users of MyStay and the patient portal, which supported enrollment and continuity of communication. For DisCo, use of the app is now fully integrated into the discharge process.

Involving patients in the design process supports use and usefulness of novel innovations. Boston Children's Hospital worked

⁸ Dunn, Kelly. "Engaging patients and families after discharge." Presented at HIMSS 2015. http://exhibitionfloor.himss.org/mhealth2015/Custom/Handout/Speaker0_Session526_1.pdf

closely with its patient advisory board to identify the types of information that would be most useful to include in MyStay.

Developers of DisCo also incorporated feedback from the user survey into the design of the tool, enhancing engagement prompts to the families and creating continuous engagement opportunities.⁹

Implementation scaled across multiple clinical services by keeping

DisCo flexible in its design and implementation. As noted above, clinical teams can specify the questions and timing for structured follow up using DisCo. Implementers have used various team members, including nurses or administrative staff, to conduct this follow up depending on staff availability and efficiency. Teams can also decide the workflow requirements and set their response thresholds which allow some teams to review DisCo once a day while others are more vigorous. For each implementation plan, developers are careful to review DisCo's capabilities with the clinical teams to define the customized parameters of use.

⁹Dunn, Kelly. "Engaging patients and families after discharge." Presented at HIMSS 2015. http://exhibitionfloor.himss.org/mhealth2015/Custom/Handout/Speaker0_Session526_1.pdf