FamilyLink: A NICU Virtual Viewing Program
Larry L. Sautter Award for Innovation in Information Technology – 2020

Project Title: FamilyLink: A NICU Virtual Viewing Program

Submitter's Name, Title, and Contact Information: Ilana Sigal, MPH, Pediatric Telehealth Project Manager, UC Davis Health, isigal@ucdavis.edu, (916) 734-2639

Project Leader(s) and Team Members: Kristin Hoffman, MD, Hadley Sauers-Ford, MPH, George Wu, Kathryn Wong, Noel Conner, Dan Cotton, Peter Ruan, Kate McLoughlin, Uma Ravi, Shijo Rajan, Shannon Bryans, Ilana Sigal, MPH, James Marcin, MD, MPH

Project Summary: FamilyLink is a UC Davis Health application that allows authorized family members the opportunity to virtually visit with their hospitalized baby though a secure connection even when they are not able to physically be at the bedside. Virtual visits through FamilyLink promote family centered-care, increased bonding, emotional support, and family participation in care.

Project Narrative:

  Background: UC Davis Children's Hospital's Neonatal Intensive Care Unit (NICU) cares for seriously ill infants from our 33-county service area spanning from Central California to the Oregon and Nevada borders. Parents and families of hospitalized newborns come from all over the large service region, often traveling far distances. Moreover, babies admitted to the NICU often require long hospital stays for weeks or even months. During these stressful and long hospitalizations, parents and families must juggle traveling back and forth to the hospital, returning to work and other life obligations, and caring for other children at home while their baby remains hospitalized in the NICU. In 2014, in order to enhance family-centered care, reduce stress, increase infant-parent bonding, encourage family participation in care, and provide emotional support for parents, a multidisciplinary team began a telemedicine program enabling parents and families to virtually visit with their hospitalized baby while not physically visiting the bedside. Starting with just six cameras, the team developed an innovative telemedicine solution - called FamilyLink - using videoconferencing technology, modified webcams and flexible tripods to mount to infant isolettes, warmers, or cribs.

  In 2018, the FamilyLink team, led by UC Davis Health (UCDH) neonatologist Kristin Hoffman, began efforts to expand and improve the virtual visit program to satisfy the unique needs in the NICU. Ultimately leading to the development of the novel FamilyLink application from scratch, these critical efforts focused on three main objectives:
  1) Identify and develop a software solution to both increase security and simplify workflow across all three user touchpoints including enrollment, video initiation at bedside, and family login
  2) Expand capacity beyond 10 users
  3) Expand access to all 49 NICU beds

FamilyLink Application Development and Deployment: Over the years, the team has evaluated commercially available products but found they were prohibitively expensive, required high bandwidth and technical support, and did not fit the unique needs of the NICU program. In 2019, the previously Jabber-based FamilyLink program switched to a Zoom-based system. Leveraging the Zoom API, the development team at UCDH began developing a new application, automating the enrollment process and family login process and creating a custom web portal with landing pages for administrators, nurses, and families (See Figures 1 and 2). The use of Zoom also enables compatibility across platforms, allowing families to participate from their personal devices and varying internet connection availability.
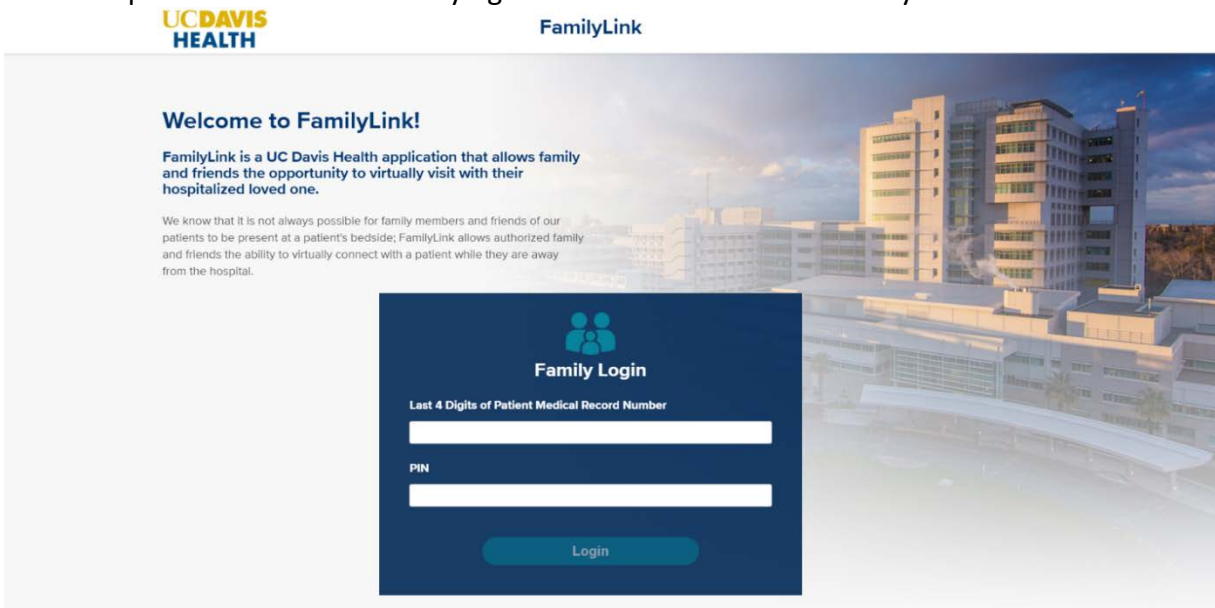

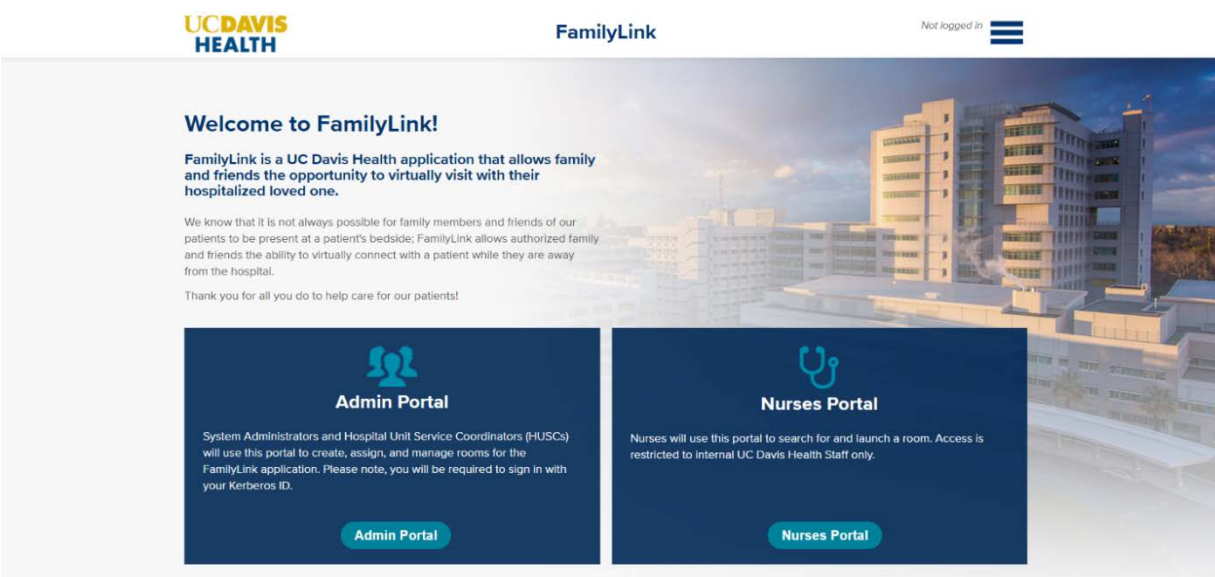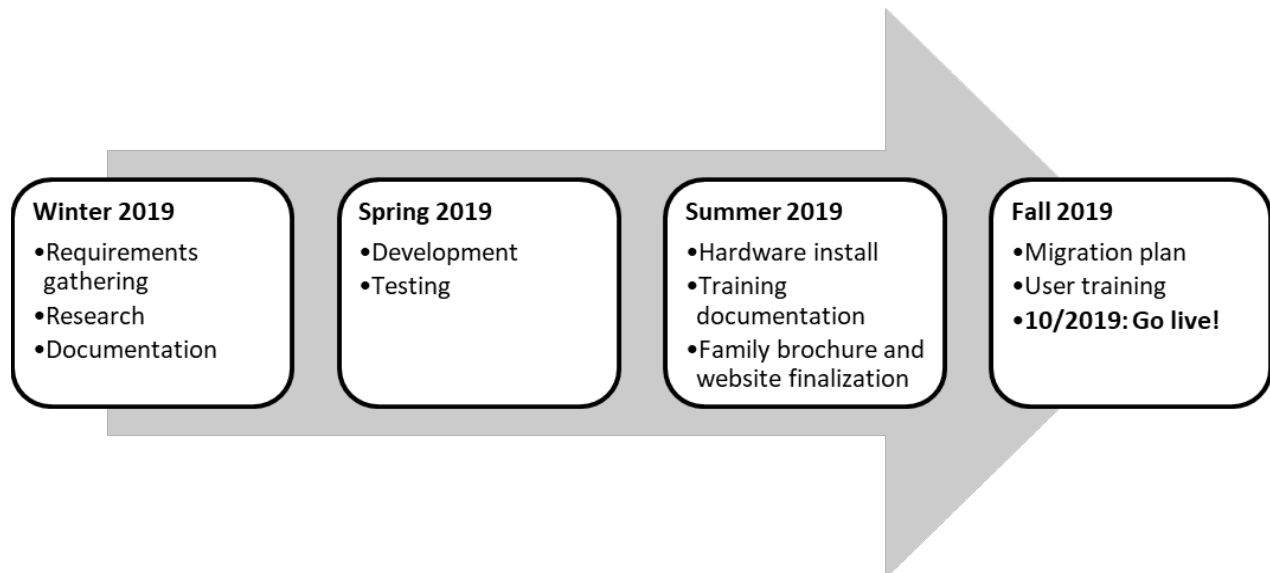***Figure 1.*** *FamilyLink Family Landing Page*

Figure 2*. FamilyLink Admin and Nurse Portal Landing Page*

Figure 3. *Flexible tripod and webcam mounted to crib*

In October 2019, the team deployed the new FamilyLink application to the entire NICU, including all 49 beds on the unit. This new application provided expanded access and capacity so every infant admitted to the NICU may participate in the program, streamlined enrollment process, simplified nursing login at the baby's bedside, upgraded user-friendly family interface, and increased security.

Winter 2019
•Requirements gathering
•Research
•Documentation

Spring 2019
•Development
•Testing

Summer 2019
•Hardware install
•Training documentation
•Family brochure and website finalization

Fall 2019
•Migration plan
•User training
•**10/2019: Go live!**

Figure 4. *Deployment Timeline*

Workflow: Upon admission to the NICU, the Hospital Unit Service Coordinator (HUSC) enrolls each baby in the FamilyLink program, assigning the baby a 'virtual room' and automatically generating a unique pin number for the parents. Parents are introduced to the program and given a brochure with information and the steps to initiate a virtual session. When parents are not able to visit their baby in the hospital, they can call the NICU to request a FamilyLink virtual session. The baby's nurse is notified and then logs into the secure Nurse's Portal and positions the webcam. The nurse verifies the baby's identity and starts the video. Parents visit the landing page from a cellphone, computer, or tablet, verify their identity and enter their unique pin, and join the video session.

Impact & Project Success: The FamilyLink program is a collaboration across several departments and multidisciplinary teams at UCDH including the Children's Hospital, Center for Health and Technology, NICU, Patient Care Services, Information and Technology, Academic Information Systems and more. Since the rollout of the FamilyLink application and program expansion in October 2019, all families with babies admitted to the NICU are able to use this program upon admission.

Figure 5. *Dr. Hoffman sets up webcam for NICU patient*

The developed application supports a streamlined enrollment process and simplified nurse's video initiation at the baby's bedside which has dramatically decreased the manhours required to assign and discharge each baby to a 'virtual room', while allowing UCDH to brand the service with a custom interface. The improvements to the enrollment and video initiation process have allowed for increased family participation in the program and supported the rapid uptake in utilization. Specifically, since October 2019, usage has increased from an average of approximately 75 monthly encounters to over 320 monthly encounters.

*"This is the best thing. When I can't make it in because I am sick or out of town, I love the webcams because I can see him if I'm missing him," – **Mother of baby in NICU***

*"It has been indispensable as a means of staying connected to our baby. Frankly we wouldn't have the same attachment or rapport with his care team without it," – **Father of baby in NICU, lives 90 minutes from UC Davis Children's Hospital***