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Technology Department

A Pediatric Primary Care Nurse Triage Telehealth Model of Care

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Children younger than 15 years old utilize an estimated 71 million primary care office visits per year for acute illnesses, and pediatric ill visits are the leading cause of parental work absences (Cherry, Burt, & Woodwell, 2003). When concerned about their child's health, a parent typically calls the primary care provider office and speaks to a nurse, who follows standardized triage protocols to understand the concern and make a disposition recommendation such as a same-day clinic appointment, emergency department (ED)/urgent care (UC) visit, or watchful waiting at home/home care. The goal of nurse triage in primary care is to ensure that patients receive the most appropriate service and guidance according to their clinical presentation. Secondarily, preventing unneeded clinic, ED, and hospital utilization among infants and children is also a primary triage goal, as these utilization events represent a substantial cost to both families and payers and strain medical resources (Brokamp et al., 2018). However, a fundamental limitation of nurse triage via telephone is the inability to visualize the child and caregiver, which can result in the omission of important clinical information that could improve triage accuracy and subsequently, the disposition recommendation.

An alternative nurse triage model that has the potential to improve both the initial assessment and subsequent disposition outcomes is telehealth triage. "Telehealth is the delivery of health care at a distance, using information and technology" (Wade, Karmon, & Hiller, 2010, p. 1) to decrease costs, minimize transportation barriers, improve the efficiency of health care workers and improve timely and equitable access to services The prevailing telehealth model in pediatric settings is in specialty care, where patients travel to a facility with the health technology to be seen by a provider located elsewhere, often many miles away in a tertiary care center. Telehealth technology, to improve the initial nursing triage process, is presently less common in primary care despite the potential for improving triage accuracy, increasing patient engagement, and enhancing patient-provider communication. With these opportunities in mind, the Pediatric Primary Care Center (PPCC) at Cincinnati Children's Hospital Medical Center (CCHMC) implemented a telehealth nurse triage program in 2016. The objective of this column is to describe the development of the program including the technological requirements, nurse competencies, and alterations to clinic workflow needed for successful program implementation.

Community and clinical context

Cincinnati Children's Hospital Medical Center is located within Hamilton County, Ohio, home to 190,000 children living across 222 discrete urban, suburban, and rural areas (Brokamp et al., 2018). The PPCC serves as a medical home to 18,745 primarily urban, low-income children and provides up to 680 outpatient visits per week. Of the 37,000 families that are served each year, 85% of them have Medicaid coverage. Approximately 800 telephone calls are triaged weekly by 17 Registered Nurses to address patient/family concerns, provide education, and determine the need for additional care. In 2016, PPCC nurses began to explore a telehealth option for triaging certain conditions such as rashes, potential eye infections, and cough/congestion. The motivation for adding a video conferencing application to the nurse triage process was to enhance bidirectional visual and nonverbal input during the encounter. The expectation was that visualization would ultimately improve the triage assessment accuracy, facilitate communication, and enhance the effectiveness of education and guidance.

Technology requirements

The Center for Telehealth at CCHMC provides the technology infrastructure and training needed for implementation of telehealth triage in the PPCC. A clientless video conferencing application entitled Cisco Jabber (Version 12.5, 2018) is used to interact with patients/families through a text link that sent to the caregiver's smart device. *Cisco Jabber* provides real-time interactive video that connects the child and caregiver with the nurse, transmitting visual and auditory information at the same time. The telehealth encounters are HIPAA compliant using end to end encryption to ensure security and privacy, and occurrences are never recorded.

The technology needs for the PPCC triage nurses includes a personal computer (PC) loaded with the secure video software, a webcam, and noise-canceling headphones for privacy and confidentiality. Similarly, the technology needs for the patient/care giver to engage in telehealth are minimal: a smart device with a forward-facing camera, the ability to load the software application, and access to Wi-Fi (or a data plan). As of January 2018, 95% of adults in the US have access to a mobile phone, and of that population, 77% own a smart phone (Pew Research Center, 2018). In 2016, The Center for Telehealth surveyed over 100 patients across multiple clinics and found that over 95% of patients and families have the personal technology and data/Wi-Fi access, and ability to load the telehealth application.

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Nurse competencies

Triage nurses are experienced primary care nurses, but the degree of training each nurse required to develop competency with the telehealth triage format varied based upon individual characteristics. Standardized triage protocols (Schmitt, 2019) are embedded within the CCHMC electronic medical record system. Additionally, triage nurses were peer-trained using a two-way headset during live triage calls during a four to eight-hour shift. There are no minimum training sessions. Side by side triage and telehealth calls continue until the trainee is deemed competent in following the usual protocols while assessing the patient over a live video feed. Training was also necessary on how to document, the use of a "telemedicine", the reason for calling, a smart phrase for encounter consent and the verbiage to aid the caregiver in the manipulation of the smart device to obtain the best possible assessment. For instance, wheezing can be heard when the microphone on the caregiver's smart device is placed in the upper airway region, and retractions can be visualized when the camera is centered over the child's trunk.

Dissemination of the technology was completed one nurse at a time to ensure proper training and support during the learning process. In September 2018, 17 out of 23 PPCC triage nurses were fully trained to initiate and receive telehealth calls.

Workflow

During the telehealth implementation, three plus nurses placed in one large workroom versus two nurses placed in a small workroom was tested for volume and distraction. This process proved to be invaluable in engaging the nurses and encouraging the adoption of the new workflow utilizing telehealth. After multiple nurses were trained, and their competency improved, noise-canceling headphones were introduced within the large workroom. This allowed nurses to be in the same space to receive peer support and encouragement when using the technology.

The workflow of a telehealth triage encounter is different than triage conducted over the telephone. Caregivers initiate an encounter via CCHMC's centralized primary care call center. Once the nurse receives a call and identifies that a concern can be best assessed via video, she/he requests caregiver participation in a telehealth triage session. If the caregiver agrees, the nurse sends a telehealth link via text message to the caregiver. The caregiver clicks the link and initializes the telehealth session from their device. Caregivers can store the telehealth link on their smart devices and use it again in the future if they would like to contact the nurse directly for a telehealth triage session.

Implementation

Implementation began in October 2016. In the month before application, a small team of nurses and physicians tested both the telehealth technology as well as interrater reliability of triage assessment and disposition recommendation. The nurses identified patients that were physically being seen for rash, eye complaints, or respiratory issues that day in clinic. Once the pediatrician completed their visit with the patient and determined a diagnosis and outcome, a nurse then presented the telehealth technology to the patient and obtained permission to engage in a video-based triage encounter in the exam room as if the patient and family were located within their home or community. The triage nurse and the pediatrician did not have contact with one another before their encounters with the patient, increasing the likelihood that assessments and recommendations were independent and unbiased. Encounter dispositions from eight nurses' simulated telehealth encounters and physician visits were compared, and there was 100% agreement in disposition recommendation. During these initial patient encounter, language, and presentation of the telehealth, technology were adjusted to meet families' literacy and educational levels. Small tests of change during the first two years of implementation helped to make improvements to the process.

Implementation challenges

During the study period (September 2016–February 2017) 3% of the encounters resulted in technology failures mainly due to user error such as misinterpretation of downloading instructions. Scripts, job aids, and enhancements were developed by the staff to ward off potential failures as rollout progressed. Low nurse adoption was an additional initial barrier to implementation; nurses felt that they were being asked to do "just one more thing" or to work "out of their scope." According to the Quality Chasm report (Institute of Medicine, 2001), nursing core competencies include patient-centered care and working with interdisciplinary teams for quality improvement and evidence-based practice. Adoption concerns were addressed individually and in a group setting as concerns arose. The duration of telehealth calls was measured during the study period as well. Telehealth calls ranged from 3 to 62 min, with an average of 19 min per call. Traditional telephone triage calls are comparative.

Outcomes evaluation

Informal qualitative feedback from caregivers suggests that time and travel can be reduced by using telehealth triage, that they felt better "seeing" (via video) a nurse, and that the technology was "easy" and "convenient." For example, a mother contacted the PPCC Center because she felt her preschooler was having difficulty breathing. Through a visual nursing assessment enabled by telehealth, the child was noted to have no evidence of respiratory distress. The mother was able to keep the child at home with support and education from the nurse. We are formally evaluating healthcare utilization outcomes of children who received telehealth compared to telephone triage in an ongoing study. This technology allows triage nurses to have a more precise triage assessment. We also believe that the act of having a face to face encounter produces relationship and trust building between caregivers and medical staff. Further research will examine these relationships and how they affect this marginalized urban population.

Conclusion

Primary care nurse triage conducted via telehealth has high potential to improve access to care, reduce cost, improve patient outcomes, and enhance the quality of life for children and their families. With over 77% of adults in the US owning a smart phone, (Pew Research Center, 2018), telehealth triage is an innovation that can be implemented in almost any medical home or specialty practice. The use of telehealth can improves the visualization of the child from afar and could ultimately improve the triage nurses' assessment accuracy, facilitate communication, and enhance the effectiveness of patient and family education, and guidance.

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