DUKE UNIVERSITY SCHOOLS OF NURSING AND MEDICINE

Duke University School of Medicine in Durham, North Carolina, USA, is one of the nation’s premier schools for medical education, clinical care and biomedical research. It includes research efforts of basic and clinical faculty in 40 departments, centers, institutes and initiatives. The School of Nursing includes research and clinical faculty from three divisions focused on clinical health systems and analytics, healthcare in adult populations, and health of women, children and families. Their combined efforts make Duke one of the largest biomedical research enterprises in the United States.

Goal

• To design a patient-centered, skill-based interactive learning tool for improving skills for medication management and patient-provider interactions related to medication use

Opportunity

• To develop an app to teach patients the skills required to identify and organize pills in a daily and weekly medication dosing schedule.

Project

Duke Pillbox is a SMART on FHIR® app that uses HL7® FHIR® to access the patient’s actual medication list from the electronic health record (EHR) system.

During the discharge plan instructions at the end of a hospital admission or during a provider clinic visit, the patient is taught how to select the prescribed pills from a pick-list of pill pictures, drug names and doses.

Duke Pillbox was developed in collaboration with Interopion
Using a tablet or other device, the provider shows the patient how to correctly fill the electronic pillbox with the correct pills in the correct slot indicating dosing frequency and time of day. While the provider demonstrates how to fill the pillbox, the device records the user actions that are correct for the individual patient. The patient then attempts to repeat the process to demonstrate that they have learned the skill and can accurately fill the electronic pill organizer (pillbox). When the patient loads the correct pill data, the exercise confirms the achievement.

The application tracks the patient’s performance and records a skill acquisition score, allowing the provider to evaluate the patient’s skill-based learning across settings and time.

**Progress**

The innovative design features pedagogically appropriate strategies to overcome health literacy barriers and optimize patient opportunities to communicate questions and concerns about medication management with providers.

The app engages patients and providers in communication about medication-related side-effects, barriers to access, or changes in scheduled medication dose or frequency. It also allows for longitudinal data capture and evaluation of medication reconciliation, patient understanding of medication, and patient skills for self-managing medications over time and across settings. Further, the application supports nationally recognized reimbursement and quality reporting requirements for care providers. Additional functionality is in the planning stage.

Duke Pillbox has demonstrated improved self-management through patient learning, communication and user-satisfaction outcomes in hospital, clinic and home settings.

— Catherine Gilliss, PhD, MSN, RN, FAAN, Helene Fuld Health Trust Professor of Nursing, Duke University School of Nursing; professor, Department of Community and Family Medicine