# Easing complex medication management with computer tools

August 9 2012



Raman Khanna, MD, MAS, assistant professor in the UCSF School of Medicine, developed a database program to help patients manage complex medications. Photo: Susan Merrell

For the millions of heart patients taking warfarin, an anticoagulant drug used to prevent dangerous blood clots, dosing is a time-consuming hassle. Too little won't work; too much can be dangerous.

Frequent visits with doctors, nurses and phlebotomists are required to ensure safety with the potent but effective drug as it interacts with the body's constantly changing blood chemistry.

To help address this challenge, Raman Khanna, MD, assistant professor at the UCSF School of Medicine, wanted to see if an easily used computerized data tool could take some of the labor out of warfarin

management.

Using a mathematical formula, Khanna developed a computer program that tracks individual patients on a calendar and provides alerts when a lab test is due to ensure the patient's blood is a safe consistency.

Regular blood tests are still needed, but the program reduces the time nurses and doctors spend examining patient data, making calculations, and consulting each other.

Though he knew something about database development for managing medications from a class taught by Michael Kohn, MD, Khanna says he knew little about their "front end" where people enter and read information. "I had no idea how to do any of that."

To fill the critical gap, Khanna turned to the Consultation Services program managed by UCSF's Clinical and Translational Science Institute (CTSI). The service matched him with none other than Kohn, assistant professor of epidemiology and biostatistics at UCSF's School of Medicine.

Like other UCSF faculty and senior staff, Kohn works as a consultant for the service and is valued for his expertise in connecting technology to direct patient care.

"Michael helped me overcome a knowledge gap that made it difficult for me to test my project in a hospital setting, Khanna says. "He walked me through adjustments to the database and showed me how to create special kinds of forms for data entry. It might not have been possible, or it would have taken much longer to do this myself."

With Kohn's assistance the program became more user friendly, requiring minimal training from nurses who helped field-test it, Khanna

says. He added that the nurses found the system a welcome time-saving improvement.

UCSF has since adopted Epic, a comprehensive electronic medical records management system that includes capacities similar to Khanna's database.

While Epic subsumes his warfarin database, Khanna is already using his skills on new projects, such as a data management system for hypertension patients, he says. "The lessons I learned have wide application, since good database design and implementation are critical to practically everything we do now in this electronic world."

Provided by University of California, San Francisco