ADVANCES IN DIGITAL MEDICAL INSTRUMENTS and improved analytics based on those devices are steadily improving many aspects of chronic care, ranging from more effective acute treatment procedures to better handling of undramatic but important logistics such as scheduling visits to a provider.

Among the most visible of these advances are remote monitoring programs for people with chronic conditions. For instance, the Province of Ontario (Canada) runs a Telehomecare program for people with congestive heart failure and/or chronic obstructive pulmonary disease that monitors patient data daily and provides regular health coaching. Telehomecare has cut hospital admissions and emergency room use more than 60% among this population, and in one survey, 95% of patients reported that the program increased their ability to self-manage their condition.

Similarly, in diabetes, Geisinger Health System in Danville, Pennsylvania, lowered hospital admission rates by 18% for its patients with diabetes via remote monitoring and communications.

With the rapid introduction of digital health devices ranging from fitness-measuring watches to wearable heart rhythm monitors, the ubiquity of powerful smartphones, the increasing accessibility of EHR data, and the advent of Internet of Things connections and cloud-based data services, these patient monitoring and coaching services are becoming potentially much more effective and widespread.

For example, the United Kingdom’s National Health Service is launching a “Diabetes Digital Coach” service. Patients will sign in from their phone, tablet, or PC and answer some questions about their health. They then get a choice of five digital tools that draw on data from their phones, tablets, glucometers, and wearable devices. These tools provide varying degrees of support covering health and well-being, structured education, diet, physical activity, and insulin management.

As always, however, potential health benefits must be analyzed by clinical studies, which may provide surprising reality checks about what benefits actually are achieved. (For example, one trial reported in 2017 found that blood glucose self-monitoring delivered no significant benefits among patients with type 2 diabetes who were not treated with insulin, apparently because receiving vastly more detailed information did not motivate patients to appreciably modify their diets.)

Today’s fast-moving attempts to exploit “big data” are dramatically raising the opportunities and challenges for health care analytics. “Major sources of data for big data applications in cardiovascular medicine—and in health care overall—include administrative databases (for example, claims for services and pharmaceuticals), clinical registries, and electronic health record data,” notes a 2016 article in Nature Reviews Cardiology. “Additional data sources are increasingly available, such as biometric and other...
data received directly from patients (for example, derived from wearable or other technologies), patient-reported data (for example, from standardized health surveys), data derived from Internet use such as social media, medical imaging data, and biomarker data, including all the spectrum of ‘omics’ data (that is, genomic, proteomic, and metabolomic data).”

“Big data analytical applications, such as predictive models for patient risk and resource use, have great potential to improve cardiovascular quality of care and patient outcomes,” the authors continue. They add, however, that these applications “are still at a nascent stage of development and evaluation, and evidence showing they improve quality of care and patient outcomes is lacking.”

Overall, the rapid advances in collecting and analyzing patient data will bring enormous benefits to people with chronic conditions. But these benefits will only arrive with a deep understanding of the challenges of health care delivery and an unyielding focus on practicality, cost-effectiveness, and, above all, the needs and wishes of individual patients.