Sandia Medical Devices

Medical monitoring technology has advanced significantly in the last decade. Monitoring that once required a visit to a health-care facility can now be performed by devices located in a patient's home, or carried or worn at all times. Examples include measures of glucose level (blood sugar), pulse, blood pressure, and electrocardiogram (EKG). Measurements can be transmitted via telephone, Internet connection, and wireless data transmission standards, such as Bluetooth. A particularly powerful technology combination is a wearable device that records data periodically or continuously and transmits it via Bluetooth to a cell phone app. The cell phone app can inform the patient of problems and can automatically transmit data and alerts to a central monitoring application (see **Figure 2-17**).

Health-care providers and patients incur significant costs when glucose levels are not maintained within acceptable tolerances. Short-term episodes of very high or very low glucose often result in expensive visits to urgent care clinics or hospitals. In addition, patients with frequent but less severe episodes of high or low glucose are more susceptible to such expensive, long-term complications as vision, circulatory, and kidney problems.

Sandia Medical Devices (SMD), an Albuquerque manufacturer of portable and wearable medical monitoring devices, has developed a glucose monitor embedded in a wristband. The device is powered by body heat and senses glucose levels from minute quantities of perspiration. SMD is developing the Real-Time Glucose Monitoring (RTGM) device in partnership with New Mexico Health Systems (NMHS), a comprehensive health delivery service with patients throughout New Mexico. The system's vision statement reads as follows:

> *RTGM will enable patients and their health-care providers to continuously monitor glucose levels, immediately identify short- and long-term medical dangers, and rapidly respond to those dangers in medically appropriate ways.*

SMD will develop the initial prototype software for smartphones with Bluetooth capability running the Google Android operating system. If successful, NMHS and its patients will have free use of the software and SMD will resell the software to other health systems worldwide.

FIGURE 2-17 *Data movement among devices and users*