

Taking the mystery out of missing persons

Tracking technologies can help rescue patients who escape.

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A patient with schizophrenia or Alzheimer's disease can function at home, but his family fears he would suddenly "run off"—potentially harming himself or others—unless he is watched around the clock. Can this patient avoid more-restrictive, institutionalized care without burdening the family?

Enter global positioning and radio frequency tracking technologies that are gaining wider acceptance and could one day play a role in caring for the chronically mentally ill.

TRACKING TECHNOLOGIES

The **global positioning system** (GPS) was created in 1993, when the United States Air Force launched the 24 th Navstar satellite.¹ The system contains both military and civilian signals, but civilian accuracy initially was limited to 100 feet compared with 60 feet for the military signals. This limitation has since been lifted from civilian devices.

At first, GPS technology was used to navigate vehicles; later, specialized handheld devices provide navigation for hikers.

Today, GPS receivers are available for personal digital assistants, as are specialized wrist devices. [Wherify Wireless](#) offers GPS wrist devices, including GPS Locator for Kids, which allows parents or guardians to locate children within minutes and relay a message telling them to come home. GPS devices are increasingly popular and are used in the game of Geocaching,² where players use GPS technology to hunt for a cache.

Radio frequency identification devices (RFIDs) are microchips the size of a grain of rice that allow retailers to track goods from warehouse to retail shelf. The chip contains no power source, but utilizes the energy within the initial radio signal.

RFID tags do not harbor information other than an identification number, which can be linked to a medical record or other database. Unlike bar codes, which require direct exposure to scan, hidden RFIDs broadcast themselves when activated by the radio signal, making transactions faster and more convenient.

RFIDs have caught on. Cards with RFID tags have been used at the Academy Awards ceremony to control access. Guards at jails throughout the United States use RFID tags to verify inmates' whereabouts. Customers at Exxon and Mobil gasoline stations use RFID devices (called [Speedpass](#)) to facilitate purchases at the pump or register.

In 2002, RFID implants became available at medical clinics³ and are beginning to reach the mainstream. At the [Baja Beach nightclub](#) in Barcelona, for example, guests with the implant in their arms gain access to VIP areas once they pass through the scanner (which automatically assesses the cover charge to their tab).⁴

Approximately 1,000 persons have received [VeriChip](#) RFID implants over 2 years.⁵

HOW GPS, RFID CAN HELP CARETAKERS

GPS. Caretakers can use GPS tracking devices to track a patient with a chronic mental disorder.

For example, the patient can wear a Wherify Wireless GPS locator wristwatch. To track the patient, the caretaker would log on to Wherify's demo Web site (<http://www.wherifywireless.com/demo.htm>) and enter the device's ID number. After clicking on

the “locate” button, the locator device is contacted and its position and time of position is displayed on a map. Alternately, subscribers can call an 800 number and ask the operator to relay the locator address.

The wristwatch or locator phone costs about \$200, and a monthly subscription ranges from \$20 to \$45 depending on number of location queries. The wristwatch comes with a remote-activated safety lock feature to prevent the patient from taking it off.

RFID. VeriChip implants are geared for indoor use, but can supplement a GPS device to track a chronically mentally ill patient.

The 11-millimeter chip, commonly used for standard security applications, is injected into the fatty tissue of the right tricep. When the recipient is near a VeriChip scanning device, the chip radios an ID number to the scanner. If the number matches an ID number in the database, the person with the implant can enter a secured room or complete a financial transaction.⁵

The FDA is reviewing whether hospitals can use RFID implants to identify patients and allow staff access to medical records without violating patients’ privacy.⁵

RFID tags located in wristbands could be used to identify hospitalized patients and prevent medication errors. RFID-tagged identification cards could help authenticate staff for access to the electronic medical record. Tags embedded in the bottle cap could measure medication compliance,⁶ and blister packs reveal when the medication was last taken.⁷ Special probes also could determine if the medication has expired or been stored properly.

INVITING ‘BIG BROTHER’?

Critics, however, say use of GPS or RFID technology threatens privacy. The group [Consumers Against Supermarket Privacy Invasion and Numbering \(CASPIAN\)](#) complains that unique ID tags identify who purchased which product and where. Because the monitoring is passive via radio waves, these tags can be hidden and read at a distance—meaning that people can be monitored without their knowledge or consent. Critics also fear that the radio waves may pose a health hazard.⁸

Accuracy is another concern. Although GPS technology provides location information, the locator device still depends on cellular phone technology to transmit the information. Poor cellular coverage areas may decrease the device’s usefulness. More importantly, because GPS devices require a clear view of the sky to access the satellites, they do not work indoors. Thus, a patient must have escaped the house for the device to work.

Related Resources

1. World Research Group: Leveraging RFID for hospitals. <http://www.worldrg.com/HW455/agenda.asp>

Disclosure

Dr. Luo reports no financial relationship with any company whose products are mentioned in this article. The opinions expressed by Dr. Luo in this column are his own and do not necessarily reflect those of CURRENT PSYCHIATRY.

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