



February 2006

Technologies Improve Care in First Minutes

New systems give doctors and ambulance crews more upfront information that can help save lives.

By Zack Martin, Managing Editor

The 60 minutes after an accident occurs or an illness is diagnosed are known as the "golden hour," the time when the right-or wrong-decisions have the most impact on a patient's condition.

Across the country, a growing number of ambulance crews and emergency departments are using information technologies to increase the odds of making the right decisions in the first moments. For example:

- * The University of Arizona Medical Center and the city of Tucson are starting to use cameras that enable emergency physicians to see what's taking place in an ambulance and at the scene of an accident.
- * Henry County, Iowa, is using technology that sends a patient's vital signs from an ambulance directly to a hospital emergency department and doctor's computers.
- * Cleveland's Public Safety Department is shaving minutes off its dispatch time by using global positioning systems to make sure the ambulance closest to a location is dispatched.
- * EMS personnel in Stamford, Conn., are using text messaging to quickly gather information on new patients.

The Tucson project, a joint effort between the city and the university, aims to change the golden hour to the "golden minute," says Rifat Latifi, M.D., a trauma specialist at the University of Arizona Medical Center.

The system includes video cameras inside and outside the ambulance so doctors can see what's happening at every step. Hospital emergency department staff controls the cameras.

The patient's vital signs are also transmitted from the ambulance via wireless broadband network directly to doctors at the emergency department. Other images,

such as ultrasounds, can also be transmitted en route for a doctor's review. The project uses technology from Ridgefield, N.J.-based General Devices.

"We're going to have live access to events unfolding in the emergency scene and in the process of transportation," Latifi says. "This will put us at the scene so we can help a patient from anywhere."

Physicians in Henry County, Iowa, are not able to see firsthand what's going on in an ambulance, but they can receive a patient's vital signs on their hand-held computers, says Jerry Johnston, administrator of the ambulance program for the Henry County Health Center in Mount Pleasant, Iowa.

More information early

The Tucson and Iowa projects are examples of a rapidly growing number of projects across the country that involve providing more information to doctors earlier in the emergency process, says Johnston, who is president of the National Association of Emergency Medical Technicians.

The seven ambulances serving the 20,000 residents of Henry County were outfitted with monitors that enable emergency department personnel to check a patient's heart rate, blood pressure and carbon dioxide levels during an ambulance trip. The monitoring equipment is from Minneapolis-based Medtronic Inc.

Bluetooth enabled

The monitors that log this information are equipped with Bluetooth, a short-range wireless communications protocol. The monitors use Bluetooth to connect with cellular phones that transmit the information to the emergency department or a physician's PDA. "Doctors can see what's going on with a patient in real-time," Johnston says.

Using cellular technology proved somewhat challenging because rural Henry County had spotty cell phone reception in certain areas. The hospital worked with the local cell provider to upgrade the appropriate systems and phones.

The ambulances are also equipped with Fujitsu notebooks that can double as tablet computers, Johnston says. EMTs are required to submit patient care reports, which had been time consuming and paper-based. But now the EMTs use electronic medical records. After a technician completes the care record, they go to certain areas within the hospital to upload it via a secure wireless network. The records software is from Med-Media Inc., Harrisburg, Pa.

Henry County is evaluating for a new vendors to upgrade its computer-aided dispatching. The new system will include prompts for dispatchers to use so they can get the necessary information and relay it to the EMTs while enroute to a scene, Johnston says.

The new dispatching technology also will include a global positioning system, which uses satellites to locate and track vehicles, to cut response time and make sure the appropriate units respond.

Cleveland's Public Safety Office already has three years of experience in using GPS systems in its 21 ambulances, says Cmdr. Jim Willson. The system, from Torrance, Calif.-based Radio Satellite Integrators Inc., enables dispatchers to know where units are located, whether they are moving, how fast they're moving and if the emergency lights are active. It also stores the information in case an ambulance is in an accident.

Dispatchers use the system, along with computer-aided dispatching, to identify the ambulance that's closest to the scene.

Cleveland's response time has improved by at least a minute since using the GPS, Willson says. The public safety office is upgrading its computer-aided dispatching system to further integrate the GPS and cut response times, Willson says.

Text messages

Improving access to information in the golden hour, however, doesn't necessarily have to involve specialized technologies such as video cameras, GPS systems or Bluetooth.

For example, in Stamford, Conn., ambulance crews simply receive patient information from dispatchers using text messages on cell phones, says Edward Browne, director of operations at Stamford EMS. Crews are notified of a call via the radio, but additional patient demographic information is sent by text message.

Stamford has six ambulances and seven invalid coaches, which make 100 to 110 calls a day, Browne says. Dispatchers keep track of the units using computer-aided dispatching software from Briarcliff, N.Y.-based Digitech Computer Inc. The software color-codes the units displayed on computer monitors depending on what they are doing, such as, going to lunch or on the way to the scene. "It's simple, and it's graphic. If you have a call, the dispatched unit starts flashing. It makes the dispatchers lives easier," Browne says.

Digitech also provides ambulance-billing services and doesn't charge for use of the dispatching system. Instead, the vendor handles the bill collection for the jurisdictions and keeps a percentage of each bill. Buying a new computer-aided dispatching system alone would have cost about \$40,000, Browne says. And Digitech's collection activity, which has been in use for more than two years, has led to increased revenue, he adds.