



## Fact Sheets

# Emergency Department Technology

## Main Points

- Many of the nation's nearly 4,000 hospital emergency departments are operating at critical capacity and are looking to advances in technology to improve patient care, increase patient safety, as well as measurably improve efficiency and use of resources.
- Technology alone cannot be expected to solve all the problems of the health care system. However, application of technology has the potential to transform the practice of emergency medicine.
- Information technology is changing the way today's emergency departments operate by speeding the flow of patients through bottlenecks, eliminating redundant patient records, sharing complete medical records, and allowing laboratory tests and films to be viewed instantly and simultaneously at multiple sites.
- Ensuring patient privacy is paramount as patient records and data become available to multiple physicians, insurance companies, researchers, government offices, and health care vendors, and as hospitals implement the Health Insurance Portability and Accountability Act (HIPAA).
- The American College of Emergency Physicians sponsors courses that showcase the latest technologies and advocates for a real-time disease surveillance system that will serve as an early warning system for biologic, chemical, and nuclear agents.

### Q. How many hospitals in the United States have upgraded their emergency departments?

A. Reports indicate at least one in six hospitals have upgraded their emergency departments. Since patient visits now exceed 107 million per year, and because the system is operating at critical capacity, improvements in quality and efficiency will be a vital part of solving today's emergency department overcrowding crisis.

### Q. What are the benefits of technology in the emergency department?

A.

Applying technology and streamlining processes can help reduce overcrowding by making emergency departments more efficient. As a result, customer service is improved and patient volumes are increased, making hospitals more competitive. For example, the Washington Hospital Center reported increasing the volume of emergency patients from 37,000 in 1995 to 57,000 in 1999, without expanding staff or space, because of technologies it employed to streamline services.

Automating processes can reduce a physician's time looking for charts, tracking down laboratory results, mobilizing staff, and repeatedly recording information that someone else has already recorded.

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Computerized emergency care can decrease costs and increase revenues while improving care and efficiency. It also can help reduce legal liability through decreased documentation omissions and decreased labor costs found in paper-based systems. In addition, it can decrease the number of patients who leave without being seen when waiting times are too long, which also will increase hospital revenues.

Technology can also significantly improve the physician reimbursement process. Some payers have pilot-tested their ability to pay electronic claims within 48 hours.

Some examples of technologies that benefit emergency patients include:

- **Hand-Held Computers-Hand** - held computers using wireless Internet cards are allowing emergency physicians to access and enter information at the bedside. Reference information can be accessed when and where it is needed using a "virtual electronic medical library."
- **Telematics** - Telematics is the blending of computers and wireless telecommunications technologies, with the goal of conveying information over vast networks. Applied to emergency care, it can include real-time video and data links between emergency departments and ambulances that allow remote patient assessments, automatic crash notification systems that are fully integrated with the public safety dispatch systems, and hazardous material alert systems to identify harmful substances and immediately dispatch appropriate rescue and recovery resources.
- **Portable Computers to Register at the Bedside** - This technology allows emergency patients to be taken immediately to beds. Registration clerks using wireless portable computers register them into the system.
- **Bedside Ultrasound** - Ultrasound exams can be obtained as conveniently as electrocardiograms. These are measurable efficiency improvements that improve customer satisfaction as well as patient care.
- **Physiologic Monitoring Stations** - Many emergency department patient bays are equipped with these stations, which did not exist in the early 1980s. This equipment measures cardiac rhythm, pulse, and blood pressure, as well as the level of oxygen in the blood. Computed tomographic scans also are common in emergency workups, as well as bedside ultrasonography, point-of-care laboratory testings, computerized laboratory results reporting, and on-line availability of ECGs.

**Q. What is the role of the Internet in emergency medical care?**

A. The Internet currently is used in emergency departments to:

- Instantly access information about patients (e.g., diagnostic testing results, films, and electrocardiograms).
- Provide secure, on-line access of policies and guidelines for compliance and billing.
- Conduct research and obtain medical and scientific information.
- Track hospital ambulance diversion status.
- Share patient care information among emergency departments in large metropolitan areas. (These systems use Internet technology, but in "private

networks" or "Intranets" to maintain the security and privacy of the patient information).

**Q. What are emergency departments doing to protect patients' medical records and ensure privacy?**

A. As medical information is gathered and stored in databases involving large numbers of patients, privacy issues are paramount, especially as the Health Insurance Portability and Accountability Act (HIPAA) requires hospitals to implement administrative and technical steps to safeguard the privacy electronic health data.

**Q. What is the future of technology in emergency medicine?**

A.

Experts say the changes seen so far will be dwarfed by the revolutionary transformations yet to come. The emergency department of the future likely will include the following:

- All medical personnel involved in caring for a patient will be working from the same electronic medical record.
- Patient information will be gathered automatically rather than manually, and instantly available to numerous people simultaneously.
- Electronic patient charts and medical information from remote locations will be electronically linked and available instantaneously.
- Emergency department patient processes (triage, registration, evaluation, radiology, laboratory workup, etc.) will be conducted in parallel, rather than sequentially.
- Emergency departments will be paperless, with electronic medical records for triage, patient tracking, registration, order entry, nursing and physician documentation, discharge instructions and prescription writing.
- Patients' vital signs and lab tests will be obtained instantly using noninvasive methods that don't involve the use of needles or wires.
- Most patient physiologic measures will be taken automatically, similar to how the manual taking of blood pressure has been replaced with automatic blood pressure cuffs.
- Bedside testing will be conducted, where a single technician will handle the entire transcript, compared with the numerous people involved today.
- Other technologies will include digitized radiography, low-frequency cell phones, infrared communication systems, integration of medical devices with computer systems, voice-activated ordering and documentation, bar coding, scanners for patient ID and insurance documents and discharge video kiosks.

Examples of other technological advances include:

- On-line medical information shared with other hospitals, including patient lab results, medical procedures, prescriptions and discharge summaries.
- Biometric monitoring (such as a "wristwatch" that monitors and records cardiac rhythm and events).

- Stretchers and floor tiles with built-in scales to measure body weight.
- Ultrasound monitors that record respiratory rates.
- Ambient air samples that assess components of exhaled breath.
- Thermographic sensors that detect exhalation of warm air and calculate a person's heart rate and body temperature.
- A radar flashlight developed for remote monitoring of athletes that measures heart and respiratory rates.
- Scanning lasers used in video cameras that automatically assess and record pupil size, shape and reactivity to light.

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