Over the past few years, technology has changed the way we deliver athletic health care. Many of these changes have allowed providers to render a higher level of care to patients in settings never before dreamed of.

At one time only physicians could take a blood pressure reading. Now in almost any shopping mall you can find an electronic blood pressure machine to check your BP for a quarter.

Technology has made these changes possible with minimal educational requirements. It has made the provision of emergency care more exciting and, because more care is being provided on the field, more challenging. Although life-threatening injuries in sports are rare, it is important for athletic therapists to keep up with technological advancements in emergency care if they are to stay on the cutting edge of sports health care.

This paper examines some of these changes so that athletic therapists can become familiar with them and decide which ones apply to their particular situation.

**Automatic External Defibrillators**

The automatic external defibrillator (AED) is without a doubt the greatest technological change to ever occur in emergency care. The first defibrillators were very large and heavy devices; they were found only in hospitals.

As the effectiveness of defibrillation was reflected in improved patient survival rates, the speed with which patients were defibrillated also became crucial. Hence nurses were trained to defibrillate patients since they were almost always the first to witness the event.

The first portable defibrillators were developed in 1968 and became the mainstay of paramedic interventions in prehospital cardiac arrests.

Abysmal cardiac arrest survival rates caused many physicians to look at the nature of the survivors. With few exceptions, the more quickly patients were defibrillated, the greater their chances of survival. With encouragement from these physicians, manufacturers began to develop smaller defibrillators that were easier to operate.

This reduced the level of medical training required of the operator. Communities began to look at which public agencies could respond to cardiac emergencies the fastest. The result is that firefighters and police officers across the country are providing advanced medical care with minimal training, and they are saving lives.

The AED shown in Photo 1 is an example of the many now on the market. They range from manual to fully automatic. The automatic AEDs require the operator to recognize when the patient is pulseless and apneic but do not require that the operator interpret the cardiac rhythm. The cost of these units is rapidly de-
creasing, with current models listed between $2,000 and $5,000. Only a few years ago the minimal costs were in the $5,000 range. Some units weigh less than 10 lbs.

The level of training required to operate an AED varies from state to state. For example, the new emergency medical technician (EMT) curriculum recently approved by the Pennsylvania Department of Health (1996) has a 4-hr module covering AEDs.

The American Heart Association (1990) has also developed an AED curriculum and recommends that all advanced cardiac life support courses have a module covering AEDs. Newman (1997) reports that 27 states have legislation which allows non-EMTs to use AEDs, and estimates that 71% of the country has access to early defibrillation with AEDs.

Because of these advances, athletic trainers faced with a cardiac arrest are likely to find that the first person who responds to an emergency call is not a paramedic in an ambulance but rather a police officer, firefighter, or EMT.

Athletic trainers should be aware of the capabilities of their local public safety agencies. If early defibrillation is not available in your community, find out why and work to change the situation. Nothing increases the survival rates of sudden cardiac arrest better than early defibrillation.

Spinal Immobilization

The long spine board is considered the standard of care for spinal immobilization, even though there is no research proving its efficacy. This lack of research holds true for many techniques and procedures used in prehospital care. It is a reflection of the limited but growing body of knowledge in prehospital emergency medicine.

Many clinicians and researchers are examining how prehospital care is delivered and are trying to validate common procedures. This scrutiny has led to the abolition of military antishock trousers as a prehospital treatment for hypotensive patients.

Vacuum splints for extremities were developed in the late 1970s. They work differently from air splints in that air is removed from the splint, allowing it to conform to the body part and become rigid. The vacuum mattress, used in Europe for many years, is now employed more often for spinal immobilization.

Early models were not rigid enough and had to be used in conjunction with a long spine board. This made the procedure cumbersome and time consuming. Newer models have overcome this problem and the vacuum mattress seems to be a good alternative for the long spine board.

Again, there is little research to validate or refute this, but the concept of providing immobilization that conforms to the unique body shape of the patient is ap-