Teaching Cardiopulmonary Resuscitation Via the Web

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Computer-based training via the Web offers critical care nurses the convenience of training when the individual has the desire, time, and necessity for learning. The convenience of Web-based training may be especially valuable among critical care nurses, who are often busy and have little time to attend mandatory review training sessions. In addition, staff educators are now able to use the Web as an efficient and convenient training tool to post assignments, upload multimedia critical care presentations, and download files. More importantly, the nurse educator of an organization is not required to teach each computer-based offering, a situation that leaves extra time for the educator to manage the overall program for staff development. This time savings may translate into a cost savings for the organization, which will not incur the hourly expense of ongoing repetitious materials, such as a review of cardiopulmonary resuscitation (CPR).

Literature Review

The American Heart Association (AHA) estimates that between 6 million and 8 million persons are trained in CPR every year. It is critical that the science, practice, and education of emergency cardiac care continue to grow in the United States. As part of this growth in CPR education and training, a better connection is needed so that ongoing critical care education can keep pace with the changes in the equipment, techniques, and procedures of the healthcare industry.

In the past, critical care nurses have relied on traditional sources of education materials, such as print and audio materials and videocassettes. The disadvantage of these traditional educational materials is that they become outdated quickly. Providing print materials to a large organization is expensive, and it is often difficult to ensure that participants have the most current print materials available. Old copies of texts, tests, and handouts manage to have an extended life expectancy. Moreover, audiocassettes and videocassettes often require additional equipment in order to use the material, adding additional cost and inconvenience to organizations. It is computer-based education that may play an important and educationally effective role for critical care nurses. Internet-based education may help make critical care education materials such as descriptions of the latest CPR techniques more accessible to more nurses. Realizing the importance of the Internet as a communications vehicle in the expansion of available lifesaving educational materials, the AHA is taking this vital first step by placing CPR education materials on the AHA Web site. Computer-based training can be as effective as tradition educational methods. Because learning CPR can cause anxiety for many persons, viewing the material online may be a less intimidating experience. Computer-based training can be more flexible for learners; that is, it can be available when and where a learner wishes it to be. No longer must a nurse who works the night shift attend mandatory in-service training sessions often scheduled.
during the morning or afternoon hours.

In addition, Web pages are perceived to enhance learners’ curiosity about the information and allow further exploration of more in-depth material. It has been well established that learners retain 20% of what they hear, 40% of what they see, and 75% of what they see, hear, and do. Thus, computer-based training programs yield a higher level of information retained as a result of learners’ seeing, hearing, and interacting with the information on the computer.

Program Development

All employees within the University of Wisconsin Medical Foundation who have contact with patients must be certified in CPR. This requirement means that approximately 1200 non-physicians in addition to the physicians in the organization need CPR study materials (eg, videos, pretests) circulated to them before the CPR training sessions. Getting materials to everyone who needs them can be a challenge because these employees are located in more than 50 clinic sites and 10 departments (eg, pharmacy, laboratory, surgery center) in a 5-county area.

In response to this geographic challenge, the clinical staff educator at the foundation has developed a staff education Web page. The purpose of the Web page is to provide quality, innovative, career-long learning opportunities to the organization’s diverse clinical staff by extending the educational resources of the health education department at the University of Wisconsin Medical Foundation. The Web page features educational programming via PowerPoint, heart and breath sounds, practice tests for CPR, and health-related puzzles and games on a variety of clinical topics. A subpage of the staff education home page is the CPR training Web page. One of the primary focuses of the CPR Web page is the ongoing dissemination of critical care programming, such as cardiac anatomy and physiology, CPR training materials along with CPR registration, the AHA CPR pretests, and our institution’s code-blue review set in PowerPoint. Reviewing code scenarios and taking the CPR pretests allow staff opportunities for essential studying before CPR classes. My colleagues and I also noted improved demonstrations of CPR skills and higher scores on posttests.

University of Wisconsin Medical Foundation was in agreement with the AHA that employees need the most accurate and up-to-date information possible. Developing online training for CPR seemed natural, timely, and essential. The Web-based versions of the CPR materials would be available when and where staff members wished to study so that they would not have to fit the traditional classes and video materials into their busy work schedules.

Before the Web page on CPR training was developed, much of the CPR education was done in the traditional didactic mode, either one-on-one or in small-group sessions. Although worthwhile, traditional teaching methods can be expensive and time-consuming, especially for nurses practicing in critical care areas, who often find it difficult to get someone to work for them while they study and attend classes. At a time when healthcare organizations are looking for ways to reduce labor costs, streamlining staff education and making available programs as effective and efficient as possible can make the most of staff development resources.

Web Page Development

The first step in developing the Web page was to have a clear purpose and an understanding of the target audience. The purpose of the CPR Web page was to create an informative, yet interesting educational outlet for CPR education. The Web page was intended to provide up-to-date and challenging information for those clinicians with experience and advanced skills, yet keep the information easy to follow for those clinicians with less clinical experience. The main target audience would be staff providing direct care, who need to maintain their CPR certification. The secondary audience would include receptionists and other first-time CPR students.

First and foremost, the Web page needed to capture and hold the attention of viewers. The staff had a variety of levels of computer expertise, from those of expert Internet “surfers” to those of persons who could barely navigate a single page. The goal was to place as much emphasis on the “look” of the page as on the contents of the page. Bright and colorful pictures were used to help hold interest (Figure 1), and

![Figure 1](http://ccn.aacnjournals.org/)

*Figure 1* Crash cart designates the cardiopulmonary resuscitation Web page.
movable graphics rather than traditional colored stationary pictures were used to catch readers’ attention (Figure 2). In addition, the CPR training Web pages have minimal clutter to help lessen the confusion for persons with little computer experience. A 5-column format makes it easy for readers to choose the necessary CPR topic (Figure 3).

Category Selection

Reviewing CPR techniques via the computer before a CPR certification or recertification class can be the best use of both staff members’ and instructors’ time, because the preparatory work has been done before class. Staff members can come to class better prepared or can e-mail clinical staff educators with questions before class. In this way, staff members come to a recertification session and can test out their skills and take the CPR posttest. The CPR training page is organized with the most important training subjects listed in the first 2 columns (Figure 3). CPR preparation, training dates, and registration are found in the center of the page, and the less-used policy and procedure items are found to the far right on the navigational page.

In the first column, titled “CPR,” readers can select from instructional information on CPR skills for dealing with infants, children, and adults. This column highlights a step-by-step approach to basic life support. Each subpage lists the correct sequence in CPR with correct compression and ventilation ratios and a description of appropriate CPR techniques, along with the AHA CPR Facts. The graphics used for instruction move to show the correct hand placement and the appropriate “pump and blow” technique. For example, users can view the arms moving up and down during compressions (Figure 4) and the head moving to the side during breathing (Figure 5).

In the second column, titled “Choking,” users can view information on procedures to use when an infant, a child, or an adult is choking. For example, the Heimlich maneuver is depicted on the adult and child pages, whereas the infant page shows the sequence for the proper sets of back blows and chest thrusts (Figure 6). At the bottom of each choking page is a link (designated by a jumping dinosaur, Figure 7) back to the appropriate CPR page should the choking procedure be unsuccessful. The computer materials in the first 2 columns were made...
available in addition to the standard AHA “View and Practice” video and AHA-approved reading materials. The benefits of the Web-based CPR materials are that each section or page takes readers only minutes to navigate and highlights only the most pertinent facts. The AHA video is 40 minutes long and outlines every detail of CPR. The AHA manual is a 150-page instructional manual. Although these sources are thorough in content, most staff do not find the time to use either of these traditional educational resources and often come to CPR sessions poorly prepared for demonstration. Finding a concise, yet complete way of giving experienced staff an update on just the facts improved their study efforts before the demonstration.

The “Get Ready for CPR” column allows employees to view the list of CPR training classes and register online for upcoming certification and recertification sessions. An approved CPR pretest can be downloaded before the class. In preparation for the CPR training sessions, the CPR instructors were to contact clinic managers to set up specific training dates, locations, and times. Clinic managers are responsible for ensuring that staff are signed up for training sessions and to ensure that the CPR training video, pretest, and access to the Web page are available to their staff members. All of these requirements and preparations are outlined on the responsibility sheets, which can also be found on the CPR training Web page (Figures 8 and 9). The purpose of the responsibility sheets is to assist the CPR instructors and managers by providing guidelines for an efficient CPR session. In the column marked “More Training Items,” users can locate facts on automatic external defibrillators, bag masks, and mock code training information.

Figure 7 Dinosaur designates link to main cardiopulmonary resuscitation page.

Figure 8 Worksheet detailing responsibilities of managers.

Figure 9 Worksheet detailing responsibilities of cardiopulmonary resuscitation (CPR) instructors.

NOTE
All materials, including handouts, videos and manuals, are kept in a location before the test-out date. This process is explained in the coordination of the Coordinator Responsibilities sheet. If in order anything from the receiving or distribution, they may contact Ronnie Patterson, Clinical Staff Educator, 270-6571.

University of Wisconsin Medical Foundation
CPR Lead Instructor Responsibilities
Test Out Procedure
- Contact clinic coordinator or site supervisor to set date and time for test-out sessions. If possible, most face to face with the coordinator.
- Go over the test-out times should be scheduled and suggest that coordinators arrange coverage for students as they are being tested.
- Be sure to contact other instructors who have signed up to help for the same day. Arrange for them to help as needed.
- Reinforce to the clinic coordinator/site supervisor that employees practice the exercises before testing out.
- On test-out day, fill out required class and instructor information on the sign in sheet (both sides).
- At the end of testing, clean disinfectant and air dry (with the help of the other instructors and participants) the manikin faces.
- Send the completed exam, class roster, and your CPR times sheet to Pat Myers, Inc. 9799, Health Education.
- Notify Ronnie Patterson, 270-6571, of any depleted or nearly depleted supplies at the completion of CPR class. Use the checklist form that is with the CPR box to check and order supplies. Allow two weeks for supplies to be replaced.
- Call Ronnie Patterson, 270-6571 with CPR dates. Request that the box(es) be sent out to the coordinators 3–4 weeks before test out. Instructor must return video and AED.

Trainers to loc. A8, Ronnie Patterson, after test-out sessions.

Thank you.
The information on automatic external defibrillators and bag masks outlines proper techniques for use and other related instructional information. The mock code subpage is a PowerPoint program with a step-by-step procedure on the clinic’s defibrillator and a scenario sequence for running a code blue. The final column, titled “Policies,” houses all company polices relating to CPR: policies on use of automatic external defibrillators, employee requirements for CPR, decontamination of equipment, and training of instructors.

**Employees’ Comments**

The CPR Web site is now ending its third year, and the employee anecdotal remarks concerning online CPR training have been positive. Employees have remarked that they can study CPR in small increments and as time permits. Many employees state that they find CPR training overwhelming and appreciate being able to learn each segment at their own pace. Some employees remarked that the online CPR training makes it easier to review just part of a program quickly, while another part of a program can be reviewed multiple times. In addition, some employees stated that they can go back after they have passed the CPR test, days or weeks later, if they want to refresh themselves on correct procedure or to double-check data that they might have forgotten. Also some commented that it is helpful to have a link via e-mail to the clinical staff educator. This link to the clinical staff educator provides quick access should questions arise as employees are reviewing the materials. Because questions can be answered in a timely manner, employees achieve a benefit similar to that of a didactic relationship without having to sit in a classroom. CPR instructors know that the online CPR Web page can be updated quickly and easily without interrupting training service.

Use of the clinical staff education/CPR training pages via computer is the best indication that employees use the training programs. Growth in the use of the CPR pages has greatly increased since the initial “go-live” date in November 2001. These training pages show an increase in “visits” each month. A visit is defined as activity for 1 user while the user is visiting 1 specific Web site. For 2002, during the first full calendar year that the clinical staff education Web page was available, the mean number of visits was 228 per month or approximately 2736 for the year. For 2003, the number of visits nearly doubled at approximately 4100. For 2004, the number of visits remained steady at just over 4000. In addition to the number of visits to the Web pages, an indication of success is the overall improvement of the organization’s CPR compliance from 79% in 2001, to 88% in 2002, to 97% in 2003, and 99.8% in 2004. This improvement can be attributed in part to our making CPR materials, training modules, and links to trainers accessible to staff online.

**Summary**

Maintaining or improving CPR training is often a main objective of many staff development departments. Yet, training time is often the first to be cut from many healthcare budgets. Facilities must have low-cost, highly effective, and efficient training, especially for critical topics such as CPR training. The AHA strives to improve the delivery of CPR training through organizational effects in maintaining recertification. With today’s population getting older with many clients who are sicker, the need to have well-trained staff members who are skilled in CPR is also essential. So how does an organization bring its goals to reach high objectives and maintain low costs together? They can do so in part by using an efficient online CPR training program.

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**References**

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