



American
Heart
Association.

BLS

BASIC LIFE
SUPPORT

INSTRUCTOR MANUAL



American
Heart
Association.

Basic Life Support

INSTRUCTOR MANUAL

© 2020 American Heart Association
ISBN 978-1-61669-769-3
Printed in the United States of America
First American Heart Association Printing October 2020
10 9 8 7 6 5 4 3 2 1

Contents

Part 1 **General Concepts** **1**

About This Instructor Manual	1
Critical Role of the Instructor	2
Course Planning and Support Materials	4
Implementing Resuscitation Education Science in Training	10
Testing for Course Completion	18
After the Course	21
Provider Renewal	22
Instructor Training	23

Part 2 **Preparing for the Course** **25**

Course Overview	25
Course Audience	27
Course Planning and Support Materials	28

Part 3 **Teaching the Course** **33**

Instructor Teaching Materials	33
Course Outlines and Agendas	37

Part 4 **Testing** **49**

Testing for Course Completion	49
Basic Life Support Adult CPR and AED Skills Testing Checklist	53
Basic Life Support Infant CPR Skills Testing Checklist	57

Part 5 BLS Lesson Plans	1-33
Part 5A BLS Renewal Lesson Plans	1-30
Part 6 HeartCode® BLS Lesson Plans	1-30

BLS Instructor Resources

These resources are available on the AHA Instructor Network at www.ahainstructornetwork.org.

Precourse Materials

Equipment List

Sample Precourse Letter to Students (Classroom Course)

Sample Precourse Letter to Students (HeartCode BLS)

Sample BLS Course Agenda With Optional Lessons

Sample BLS Renewal Course Agenda Without Optional Lessons

Sample HeartCode BLS Agenda With Optional Lessons

Sample HeartCode BLS Agenda Without Optional Lessons

Course Materials

Adult CPR and AED Skills Testing Checklist

Adult CPR and AED Skills Testing Critical Skills Descriptors

Infant CPR Skills Testing Checklist

Infant CPR Skills Testing Critical Skills Descriptors

Team Dynamics Diagram

Summary of High-Quality CPR Components for BLS Providers

BLS Lesson Plans

BLS Renewal Lesson Plans

HeartCode BLS Lesson Plans

General Concepts

About This Instructor Manual

We have reorganized our instructor manuals to provide an introductory section that discusses the science and educational principles of resuscitation training as well as the basic logistics for conducting any American Heart Association (AHA) course. For new instructors, Part 1 provides essential and practical tools to help launch them as AHA Instructors. For more seasoned instructors, Part 1 offers insights into the science and educational principles that go into the design of all AHA courses. Although some of this information applies mostly to the AHA advanced resuscitation courses, Basic Life Support (BLS) Instructors may find it useful. The remaining Parts of this instructor manual cover course-specific information.

Critical Role of the Instructor

The ultimate goal of AHA courses is to improve outcomes for people with cardiovascular disease, especially those who need cardiopulmonary resuscitation (CPR) or emergency cardiovascular care (ECC). AHA Instructors have a unique opportunity to impact the survival of real people by helping to enhance student skills through learning and practice. Instructors should use the educational design of ECC courses to simulate events that are as close to real emergencies as possible. In this way, AHA courses can prepare students to function optimally for their next emergency.

As an AHA Instructor, your role is to help your students by

Demonstrating effective case management consistent with the current AHA Guidelines for CPR and ECC

- Modeling high-quality principles of care
- Facilitating discussions with a focus on desired outcome
- Listening to students' responses and providing feedback to ensure that they understand the learning concepts
- Observing students' actions and coaching them as necessary
- Providing positive or corrective feedback
- Managing discussions and simulations to optimize classroom time and maximize learning
- Leading, modeling, and promoting prebriefing sessions before each simulation and structured debriefing sessions after each simulation

Some AHA Instructors will also teach blended-learning courses. These courses combine eLearning, in which a student completes part of the course online, with a hands-on instructor-led session. You'll learn more about blended-learning courses later in this manual.

Instructor Needs and Resources

Science Update Information



Science and education updates occur periodically. The AHA provides the following resources so that you can access these updates as they are released:

- The AHA Instructor Network, which includes the *ECC Beat*; for instructions on how to access, visit www.ahainstructornetwork.org
- The AHA website (cpr.heart.org)

For full details of all changes that were made to the resuscitation guidelines, the AHA strongly recommends that each instructor access the guidelines, available at eccguidelines.heart.org.

Instructor Network

The AHA provides the Instructor Network as a resource to instructors. Here, instructors can access up-to-date resources and reference information about the AHA ECC programs and science.



AHA Instructor Registration
www.ahainstructornetwork.org

All AHA Instructors are required to register with the AHA to be aligned with a Training Center. For instructions on how to register, visit www.ahainstructornetwork.org. Alignment must be approved by that Training Center before access to content is available. Acceptance of the user agreement is required during registration.

Once registered and approved, you will receive an instructor identification number. This number will be placed on your instructor card and is the same for all disciplines. This number stays the same if you change Training Centers. It is used on all course completions cards for classes that you teach.

The AHA reserves the right to delete or deny alignments on the Instructor Network.

Course Planning and Support Materials

Before teaching a classroom course or hands-on session, please take the time to read and review in detail the instructor manual and lesson plans, provider manual and any additional student resources, and videos. Your preparation is key to a successful and rewarding teaching experience.

As you view the videos and the lesson plans (Parts 5 and 6), note how the course is organized and the expectations for you and the students. Make notes on your lesson plans as needed.

This important preparation will enable you to teach the course more effectively and anticipate what you will need to do as the course unfolds. This is especially true for those parts of the course that require you to organize the students for practice or testing, present the video to give information, facilitate discussions, distribute equipment, conduct debriefings, and give exams or hands-on tests.

Notice of Courses



For US-based instructors aligned with the AHA Instructor Network, the AHA offers the My Courses tool, where instructors can enter and maintain the classes they offer to the general public. These are displayed to customers searching for scheduled classes on the AHA's CPR and First Aid website, cpr.heart.org. Before entering classes, check with your Training Center to determine what policies that center may have about instructors entering their classes. As an instructor, you can still add your classes for display through My Courses even if your Training Center is not participating in listing through My Courses.

For instructors based outside the United States, inform your International Training Center of courses open to the public so that they can send inquiries for classes to you.

Ordering Materials



As an instructor, you can order books and other support materials through your Training Center or directly from the AHA at ShopCPR.Heart.org. There are also distributors available for AHA Instructors outside the United States (<https://international.heart.org/en/how-to-buy>). However, only a Training Center Coordinator can order course completion cards. Work with your Training Center Coordinator to ensure that your students receive their cards.

Copyright of AHA Materials

The AHA owns the copyright to AHA books and other training materials. These materials may not be copied, in whole or in part, without the prior written consent of the AHA.



For more information and to request permission to reprint, copy, or use portions of ECC textbooks or other materials, go to copyright.heart.org.

Smoking Policy

The Training Center must prohibit smoking in classrooms and training facilities during all AHA ECC training programs.

Course Completion Cards

Only a Training Center Coordinator, or another authorized Training Center representative designated by the Training Center Coordinator, can use the confidential security code to order course completion cards (eCard or printed) for approved disciplines. The Training Center Coordinator should keep this code confidential. Training Center Coordinators cannot order course completion cards without this code.

The Training Center Coordinator has final responsibility to the AHA for the security code. The Training Center Coordinator must notify ECC Customer Support immediately if the security code is suspected as lost, stolen, disclosed, or used without authorization.

The AHA may change the code if deemed necessary to maintain the confidentiality of the code.

Misuse of the confidential security code could result in termination of the Training Center Agreement.



For more information on course completion cards, refer to the ECC Course Card Reference Guide on the Instructor Network and at cpr.heart.org.

Course Equipment

All AHA ECC courses require that manikins and equipment allow demonstration of the core skills (eg, airway management, correct hand placement, compression depth, chest recoil). The AHA requires the use of an instrumented directive feedback device or manikin in all AHA courses that teach the skills of adult CPR.

The AHA neither endorses nor recommends a particular brand of manikin or other equipment. The decision on which brand or model of equipment to use is the responsibility of the Training Center.

You can find a detailed equipment list for your course or hands-on session in Part 2 of this instructor manual.

High-Fidelity vs Low-Fidelity Simulation

Simulators have been used to teach BLS for decades. They give students the opportunity to practice and improve the clinical skills needed for resuscitating real patients.

Because of improvements in technology, healthcare professionals can more easily observe pathophysiologic signs. The variety of simulators has expanded considerably. Some are as simple and old-fashioned as using an orange to practice intramuscular injections. Others are more sophisticated, such as computer-guided mechanical devices that make practicing specific procedures look and feel more real. Improved plastics have made task trainers (eg, airway practice models) more versatile and realistic, and many manikins have lifelike features and enhancements.

While the term *high fidelity* has been used as a synonym for high technology, fidelity actually refers to the level of realism as this relates to specific learning objectives. Thus, high fidelity implies a very realistic simulation, while low fidelity implies that the student must use his or her imagination to fill in the gaps. These definitions are based on the experience of the student rather than on the device itself.

While advanced technology and high-fidelity simulation are appealing and may result in higher student satisfaction, they increase costs substantially without necessarily enhancing learning compared with more basic simulators. In fact, none of the available products are truly realistic compared with real human beings.

You may find high-fidelity manikins useful for teamwork and skills integration, but it is not certain which specific aspects of the scenario are improved by a higher degree of realism. Having a relevant case and setting for students—or matching the equipment to what the students use in their practices—may be more important than a high-fidelity manikin for translating the learning process to clinical practice. As an instructor, you can tailor your approach by using the resources available to create a high-fidelity environment that both satisfies students and achieves the desired learning objectives.

Feedback devices can accurately measure rate, depth, and recoil of compressions and rate and volume of ventilation. This feedback should be used throughout the course and for

testing so that students are able to practice until they can do it without having to think about it (ie, automatically). Because you are trying to build automaticity, it is important for students to perform these skills correctly and consistently and for Team Leaders and team members to recognize correct performance by others.

Infection Control

It is your responsibility as an instructor to ensure that a safe, clean environment is maintained in your class. Inform your students in advance that training sessions involve close physical contact with manikins and that they will be close to other students.

In your welcome letter that is sent with course materials, tell students not to attend class if they know they have an infectious disease, feel sick, or have open sores or cuts on their hands, mouth, or areas around their mouth. Participants and instructors should postpone CPR training if they are in the active stages of an infectious disease or have reason to believe they have been exposed to an infectious disease.

Equipment and Manikin Cleaning

To reduce the risk of potential disease transmission, all manikins and training equipment need to be thoroughly cleaned after each class. Manikins used for CPR practice and testing require special actions to be taken between each student. The AHA strongly recommends that you follow manufacturers' recommendations for manikin use and maintenance. In the absence of manufacturers' recommendations, the following guidelines may be used during and after class:

During Class

- Students and instructors should practice good hygiene with proper handwashing techniques.
- When individual protective face shields are used, continue to follow all decontamination recommendations listed for cleaning manikins during and after a course. In addition, to reduce the risks to each user for exposure to contaminants, ensure that all students consistently place the same side of the face shield on the manikin during use.
- If you are not using face shields during the course, clean the manikins after use by each student with a manikin wipe that has an antiseptic with 70% ethyl alcohol.
 - Open the packet, and take out and unfold the manikin wipe.
 - Rub the manikin's mouth and nose vigorously with the wipe.
 - Wrap the wipe snugly over the mouth and nose.
 - Keep the wipe in place for 30 seconds.
 - Dry the manikin's face with a clean paper towel or something similar.
 - Continue with the ventilation practice.

After Class

- Take apart the manikins as directed by the manufacturer. Anyone taking apart and decontaminating manikins should wear protective gloves and wash their hands when finished.
- As soon as possible after each class, clean any part of the manikin that comes into contact with potentially infectious body fluids during training to prevent contaminants from drying on manikin surfaces.
- If manikins are stored for more than 24 hours before cleaning, follow these steps:
 - Wash all surfaces, reusable protective face shields, and pocket masks thoroughly with warm, soapy water and brushes.
 - Moisten all surfaces with a sodium hypochlorite solution having at least 500 ppm free available chlorine (one quarter cup of liquid household bleach per gallon of tap water) for 10 minutes. Make this solution fresh for each class and discard after each use. Using a concentration higher than one quarter cup has not been proven to be more effective and may discolor the manikins.
 - Rinse all surfaces with fresh water and air dry before storing.

- Because some manufacturers have recommendations for cleaning manikin parts in a dishwasher, check with the manufacturer of the manikins being used to determine if this is an acceptable method. Some manikin materials could be damaged in a dishwasher.
- Replace disposable airway equipment at the end of each class.
- Clean manikin clothing and the manikin carrying case periodically or when soiled.
- Maintain other equipment used in class according to hospital policy. Wipe surfaces touched by students with antiseptic solution.

Course Materials

Templates

As a registered instructor, you can log in to your account to find templates for letters, forms, and other materials to help you prepare to teach the course. You will need to customize some of these materials, including the precourse letter, which tells students what they need to do to prepare for the course or hands-on session.

Lesson Plans

All AHA ECC instructor manuals include lesson plans that are intended to

- Help you as an instructor to facilitate your courses
- Ensure consistency from course to course
- Help you focus on the main objectives for each lesson
- Explain your responsibilities during the course

Your lesson plans were created to be used before and during courses and during skills practice and testing sessions, as noted in Table 1.

Table 1. How to Use Lesson Plans

When	How to use
Before the course	Review your lesson plans, making notes of anything you want to emphasize on the basis of your students' roles and environment. <ul style="list-style-type: none"> • Identify objectives for each lesson. • Define your role for each lesson plan. • Gather the resources needed for each lesson.
During the course	<ul style="list-style-type: none"> • Follow each lesson plan as you conduct the course. • Remind students what each video segment covers. • Make sure you have all the resources, equipment, and supplies ready for each lesson. • Help all students achieve the objectives identified for each lesson. • Encourage students to work in teams and to help each other. • Create an atmosphere that encourages peak performance and improvement that will carry over into clinical practice.
During practice before a skills test	A student may have a question about a certain part of skills they will be tested on. The lesson plans serve as a resource for you when answering those questions.

Using the Provider Manual

Students must have their own copy of the current provider manual to read before and to use as a resource during and after the course. The lesson plans tell you when to refer students to specific sections of the provider manual during the course.

The provider manual is designed for individual use and is an integral part of the student's education. Students may reuse their manuals during renewals or updates until new science guidelines are published.

Students taking a blended-learning course have access to the provider manual and other reference materials within the online portion. They may access the reference materials for up to 2 years from the date they activate their online portion. Students should be allowed to bring electronic devices into the classroom to access these electronic materials.

Tailoring to the Audience

Determining Course Specifics

Before you teach a course, determine the course specifics:

- Student audience
- Number of students
- Special needs or local protocols
- Room requirements
- Course equipment

Details specific for the type of course or hands-on session that you will be conducting are located in Part 3.

Course Flexibility

The AHA allows instructors to tailor their courses to meet audience-specific needs. One example of this course flexibility is local protocol discussions built into some of the lessons. For specific examples, refer to Part 2.

Any changes to the course are in addition to the basic course contents as outlined in this manual and will add to the length of the course. Instructors may not delete course lessons or course components. Any additions or alterations to the course must be specifically identified as non-AHA material (refer to the Non-AHA Content section). Some evidence suggests that adding content to the course may actually decrease learning and retention. Although it is not considered a best practice to insert additional material into this course, instructors may add related topics, as long as none of the required lessons or course content is eliminated or shortened.

Non-AHA Content

As an instructor, you can best serve your students when you can adapt to meet the needs of a specific audience. If you find that your students will be better served by adding location-specific information, equipment, or specialty-specific content and you plan to discuss that non-AHA content in class or distribute handouts, follow these rules:

- None of the required AHA lessons or course content can be eliminated or shortened.
- Any changes to the course are in addition to the basic content as outlined in your instructor manual.
- Adding additional content will add time to the course.
- Additional topics or information should be covered at the *beginning or end* of the course to avoid disrupting the flow of the required lessons.
- Any location-specific protocols or procedures that do not comply with AHA processes (eg, substituting new medications, specialized techniques) should be identified to the audience as *location-specific*.
- Any non-AHA content must be identified as *not approved or reviewed by the AHA*, and the source of the information must be provided to the students.
- Supplementary materials that you use need to be approved by the Lead Instructor or the Course Director for advanced courses, as well as by your Training Center Coordinator.
- A copy of a revised agenda and any print material shared in class must be part of the permanent course file.
- Your students cannot be tested on non-AHA content. If they complete the AHA-defined course completion requirements, they must be issued an AHA course completion card.

Students With Special Needs

- The AHA does not provide advice to Training Centers on Americans With Disabilities Act requirements or any other laws, rules, or regulations. Training Centers must determine accommodations necessary to comply with applicable laws. The AHA recommends consultation with legal counsel.
- A student must be able to successfully complete all course completion requirements to receive a course completion card. Reasonable accommodations may be made, such as manikin positioning, use of a text reader, or reading the exam to the student.
- If a student is unable to successfully complete skills testing because of a disability, he or she should be given written documentation of class attendance, with a listing of what testing was not successfully completed.
- Advisor: BLS course completion cards accommodate students who pass the cognitive portion of the HeartCode® BLS Course but cannot perform the physical skills of CPR. By successfully advising others how to perform CPR and use an automated external defibrillator (AED), HeartCode BLS students with disabilities can receive an Advisor: BLS card. Students should check to make sure that their workplaces will accept these cards. Advisor: BLS cards are available exclusively to authorized Training Centers for issuance in accordance with AHA policy.

Implementing Resuscitation Education Science in Training

According to research reviewed in the 2018 AHA Scientific Statement “Resuscitation Education Science: Educational Strategies to Improve Outcomes From Cardiac Arrest,” providers’ skills can begin to decay only weeks after taking standardized resuscitation courses, which can lead to poor clinical care and survival outcomes for cardiac arrest patients. The Resuscitation Education Statement presented evidence supporting the following strategies to improve how well providers learn and retain these critical skills.

- **Mastery learning:** To increase the likelihood that a student will truly learn key resuscitation skills, have students practice until they demonstrate mastery. AHA courses are designed to give students time to practice with video demonstration, scenarios, and group activities. As an AHA Instructor, your role is to provide the feedback and coaching to make students’ practice time meaningful and effective.
- **Perfect practice makes perfect:** Use a mastery learning model that requires students to demonstrate key skills, and set a minimum passing standard for mastery. Video demonstrations in AHA courses allow students to observe accurate and consistent resuscitation skills and to practice with the video and in group scenarios. Give students time to practice until they are comfortable with the skills and feel ready to take the skills test.
- **Measuring performance to motivate students:** Set performance standards on the basis of observable behaviors. Determine the most important measures for patient outcomes and process standards such as time, accuracy, and best practices. The skills testing checklists in all AHA courses define the passing standard for critical skills and allow instructors to measure and document student performance.
- **Deliberate practice:** Use skill repetition paired with feedback and exercises, known as *deliberate practice*, to teach behaviors that are difficult to master or should be performed automatically.
- **Use of overlearning to improve retention:** Train students beyond the minimum standard, known as *overlearning*, for behaviors that are likely to decay and would require effort to retrain someone to a level of mastery.
- **Spaced learning:** Students who participate in more frequent, shorter learning sessions have a better chance of retaining new knowledge and procedures. Strategies like eLearning, rolling refresher events, and other ways to increase learning outside of scheduled training can reinforce training after the class. Resuscitation Quality Improvement® is an example of low-dose, high-frequency training that providers can use to regularly practice skills and reinforce learning at their workplace. Instructors may offer periodic skills refreshers between course events.
- **Contextual learning:** Training that applies directly to students’ scope of practice can engage students and make them eager to expand their expertise. Ensure that team composition, roles, and contexts are right for each group activity, and consider implementing appropriate levels of stress and cognitive load.
- **Prebriefing, feedback, and debriefing:**
 - **Prebriefing:** Briefing before a learning event creates a safe environment for students by setting their expectations. Prebriefing builds rapport between instructor and student, which can make students more receptive to feedback after the event.
 - **Using data in feedback and debriefing:** Students need performance data to improve. This includes data from instructors, other students, and devices.
 - **Debriefing tools:** Debriefing tools or scripts improve instructors’ debriefing effectiveness by providing direction and content that is focused on improving learning outcomes.
- **Assessment:** Assessment of student competence is a critical part of developing efficient resuscitation teams. Plan for various, high-quality assessments throughout each course to get a broader picture of each student’s knowledge and skills.

- Innovative educational strategies: New methods of accessing up-to-date information can improve laypeople's willingness to act, provider performance, and survival rates. For example, gamified learning can improve engagement, and social media delivers information quickly to large audiences.
- Faculty development: Initial instructor training is crucial, but empowering instructors to commit to lifelong learning creates a culture of training excellence, inspires students, and enhances the classroom experience.
- Knowledge translation and implementation strategies: The best evidence evaluation won't improve patient survival if providers aren't able to apply the knowledge gained to clinical practice. According to the Resuscitation Education Statement, improving methods for translating scientific knowledge into clinical practice is an ongoing field of study that could save more lives than a new breakthrough in managing cardiac arrest. AHA courses teach resuscitation skills as well as team skills and use tools like debriefing so that students learn not only how to perform the critical skills but how to assess and analyze behaviors in real resuscitation events to help their teams improve performance.

Importance of High-Quality CPR

High-quality CPR, comprising manual chest compressions and ventilation, is the foundation of lifesaving resuscitation for cardiac arrest victims. Maintaining blood flow to the heart and brain is the first priority, ahead of other interventions, such as administering medications. Individuals and teams should focus on maintaining cardiac output at all times during an attempted resuscitation for cardiac arrest.

Too often, CPR either is not performed or is performed with too many interruptions during both out-of-hospital and in-hospital arrests. Studies of CPR skills retention have shown patterns of significant erosion of CPR skills in the days, weeks, and months after CPR training. CPR should be performed in real time with an audiovisual feedback device guiding each student's performance in all learning stations where CPR is required. This is critical for a high-performance team. In addition, chest compression fraction (CCF), the proportion of time that chest compressions are performed during a cardiac arrest, should drive increased performance in learning stations and cannot be measured unless compressions are conducted in real time. Ventilation should also be timed or have real-time audiovisual feedback to help ensure optimal performance. This is true in practice, in testing, and in real-life emergencies.

All students will have the opportunity to practice high-quality CPR and then to demonstrate these lifesaving skills during the course assessment.

Components of high-quality CPR for adult cardiac arrest victims include the following:

- Push hard (at least 2 inches [5 cm]), using an automated feedback device to assist with performance improvement.
- Push fast, compressing at a rate of 100 to 120 per minute.
- Minimize interruptions in compressions to less than 10 seconds.
- Achieve a CCF that is ideally greater than 80%.
- Allow for complete chest recoil between compressions (ie, do not lean on the chest between compressions).
- Avoid excessive ventilation, delivering breaths over 1 second that produce visible chest rise.
- Switch compressors about every 2 minutes or earlier if fatigued.

High-Performance Teamwork

With resuscitation teams, high-performance teamwork is a critical element of providing high-quality CPR and increasing survival rates. Resuscitation skills competency is most often verified on an individual basis despite the fact that successful patient outcome from cardiac arrest depends on a team. Students will learn about high-performance teamwork and will practice it in the classroom.

High-performance teams effectively incorporate timing, quality, coordination, and administration of the appropriate procedures during a cardiac arrest (Figure 1). These 4 key areas of focus include the following specifics:

- **Timing:** time to first compression, time to first shock, CCF ideally greater than 80%, minimizing preshock pause, and early emergency medical services (EMS) response time
- **Quality:** rate, depth, complete recoil; minimizing interruptions; switching compressors every 2 minutes or sooner if fatigued; avoiding excessive ventilation; and always using a feedback device
- **Coordination:** team dynamics; team members working together, proficient in their roles
- **Administration:** leadership, measurement, CQI, number of participating code team members

Teams function differently in different facilities and in all out-of-hospital settings. Knowing the policies and procedures and the local protocols of your classroom audience is essential to instructor preparation.

Figure 1. Key areas of focus for high-performance teams to increase survival rates.



The Role of a CPR Coach in a Resuscitation Team

When caring for a cardiac arrest victim, the resuscitation team must perform many important tasks. Efficiently coordinating these tasks is critical to improving patient outcome. The Team Leader is typically responsible for monitoring the performance of BLS skills in addition to overseeing many other critical tasks. Coordinating so much at once is difficult and can lead to delays and errors in treatment.

For these reasons, many resuscitation teams now include the role of CPR Coach. The CPR Coach supports performance of high-quality BLS skills, allowing the Team Leader to focus on other aspects of clinical care. Studies have shown that resuscitation teams with a CPR Coach perform higher-quality CPR with higher CCF and shorter pause durations compared with teams that don't use a CPR Coach.

The CPR Coach does not need to be a separate role; they can be blended into the current responsibilities of the Monitor/Defibrillator. The CPR Coach's responsibilities begin with the start of CPR. A primary focus is to coach team members in performing high-quality BLS skills and help them minimize pauses in chest compressions. Here is a brief summary of specific responsibilities:

Coordinate the start of CPR: As soon as the patient is identified as pulseless, the CPR Coach prompts action by saying, "I am the CPR Coach. There is no pulse, so let's start

compressions.” The CPR Coach then prepares the environment to optimize compressions. This may include lowering the bed and bed rails, getting a step stool, or rolling the victim to place the backboard and defibrillator pads. These actions help prevent Compressor fatigue and ensure high-quality compressions.

Coach to improve the quality of chest compressions and ventilation: The CPR Coach does the following to help improve the quality of chest compressions and ventilation:

- Convey objective data from a CPR feedback device to help the Compressor improve performance. Team members’ visual assessment of CPR quality is commonly inaccurate.
- Coach performance of compressions (ie, depth, rate, and chest recoil) and ventilation (ie, ventilation rate, volume and if needed, compression-to-ventilation ratio).
- State the specific midrange targets to help team members perform compressions and ventilation within the recommended range (eg, tell them to compress at a rate of 110/min instead of a rate between 100 and 120/min).
- Give corrective feedback and reinforce positive performance of CPR skills with specific acknowledgment (eg, good job with compression depth).

Coordinate provider switches and defibrillation: The CPR Coach helps minimize the length of pauses during provider switches and defibrillation. The goal is to pause for less than 5 seconds.

Here is an example of a CPR Coach’s dialogue: “Team Leader, we have 30 seconds until the next pulse check. Next Compressor, please come stand by the current Compressor. I’ll precharge the defibrillator, and then I’ll give a 5 second countdown. The Compressor will stop compressions at 1 second. Then, the Compressors will switch and hover over the chest. We’ll check a pulse, and the Team Leader will assess the rhythm. If it’s a shockable rhythm, we’ll shock immediately and then resume compressions.”

Coordinate the placement of an advanced airway: The CPR Coach coordinates the placement of an advanced airway to minimize interruptions in compressions. First, the CPR Coach ensures that the Team Leader and Airway provider have a shared understanding: “My understanding is that we’ll attempt intubation without stopping compressions. If that doesn’t work, we can pause for up to 10 seconds for the intubation attempt. Is that correct?” Then, the CPR Coach announces the start of the intubation attempt and coordinates a pause if needed. Once the pause duration reaches 10 seconds, the CPR Coach directs the Compressor to start compressions again.

Instructor Tips

- Any healthcare professional can be a CPR Coach. This person must have a current BLS Provider card, understand the responsibilities of a CPR Coach, and demonstrate the ability to coach Compressors and Airway providers effectively to improve performance.
- The CPR Coach should be positioned next to the Defibrillator and in the direct line of sight of the Compressor.
- Because the CPR Coach must continually talk to give ongoing coaching, they must modulate their voice’s tone and volume so that they do not disrupt other aspects of patient care.
- The CPR Coach should respect the Team Leader’s role and not be perceived as trying to take over leadership. They should keep the Team Leader informed, share their understanding with the Team Leader, and ask for verification of key tasks and decisions.

Calculating CCF

Healthcare providers can calculate CCF mechanically by using a feedback device or manually by using 2 timers. One timer measures the total code time from code start until code stop or the return of spontaneous circulation, and a second timer measures the total chest compression time. To measure chest compression time, the second timer is

started each time compressions begin or resume and is stopped during each pause in compressions. The chest compression time is then divided by the total code time to equal CCF:

$$\text{CCF} = \text{actual chest compression time} / \text{total code time}$$

Prebriefing

Effective briefing before a learning event, known as *prebriefing*, helps establish a safe environment for learning.

Educators can build a sense of psychological safety by prebriefing to let students know that mistakes are expected and serve as sources of learning and that interpersonal risk-taking is encouraged. Effective prebriefing builds rapport between students and instructors and encourages feedback receptivity by clarifying performance targets and explicitly outlining aspects of performance feedback relevant for the session so that students know what to expect: timing, sources, purpose (training or assessment), for example.

- Prebriefing should establish a supportive learning environment where it is safe to make mistakes and learn from them.
- This includes highlighting key performance goals and performance expectations, emphasizing the importance of ongoing practice, actively preparing students for the feedback they will receive, and describing when and how the debriefing will occur.
- Set rules and realism for the simulation.
- The high-performance team should establish goals and then discuss if those goals were met in the structured debriefing afterward.

Feedback and Coaching

At times, you will need to help a student master a skill. This may require expertise in communication and educational creativity. The fundamental principle of AHA courses is that students who are not able to master the required skills during the course can practice until they do. Instructors should be committed to finding and using the proper techniques that will be effective for a particular student. Adult learning principles coupled with debriefing techniques usually make for an effective combination. Here are some suggestions:

- Review the objectives for a particular scenario or skills station with the student.
- Give positive feedback when desired actions are observed; ask open-ended questions when nonpreferred actions are observed to determine the student's thought process.
- Use the same scenario repeatedly if necessary until the student accomplishes the objectives.

Debriefing

Debriefing is an organized, evidence-based, student-focused process that takes place in a nonthreatening environment. It is a method of assisting students in thinking about what they did, when they did it, why and how they did it, and how they can improve.

In an effective debriefing session, instructors ask questions and encourage students to analyze their own performance rather than offer only the instructor's perspective. Because this approach is focused on what the student thinks and does rather than on the instructor's viewpoint, students are more likely to remember and apply the lessons in their practice.

Feedback vs Debriefing

Simple feedback is typically geared toward correcting student actions the instructor has observed—an approach that can sometimes have the unintended consequence of fixing one mistake only to create others. Effective debriefing, on the other hand, focuses more on understanding why students acted a certain way, which allows correction of their thinking. Students typically do things for a reason that makes sense to them. Good debriefing helps students review their own performance and achieve a deeper understanding.

Although debriefing takes longer than simply giving feedback, reframing students' understanding will make the lesson more applicable to real life and will have a more lasting impact on future performance.

Effective Debriefing Characteristics

Effective debriefings must be fit for the purpose and focus on how to achieve performance standards. Specifically, instructors should attend to the established debriefing processes, tailor debriefings to context, use debriefing scripts to promote debriefing effectiveness, and view training as an opportunity to model debriefing practice and to prepare students for the process of a debriefing after actual clinical events.

Students need performance data to improve; these data should be included in debriefings whenever possible. Quantitative data provided during resuscitation education should come from several sources, including instructors, CPR devices, and data from simulators. Some data may be available in real time; other data, during debriefings.

Feedback and debriefing should be part of a larger curriculum design and should not occur in isolation. These powerful educational interventions are integral elements to overarching curriculum design considerations.

The characteristics of an effective debriefing session include

- Active participation
- Student discussion
- Self-analysis
- Application
- Thorough processing of information

With effective debriefing, students should

- Analyze and evaluate what happened
- Recognize how tools can help them manage situations
- Develop the habit of self-critique

We recommend using structured and supported debriefing, a learner-centered debriefing model that focuses on what the student knows and thinks. This approach draws on evidence-based findings from behavioral science to focus on critical thinking and encourage students to analyze their motivations and performance. It is an efficient and organized process to help students think about what they did—why, how, and when they did it—and how they can improve.

Structured and supported debriefing follows a simple 3-step format to achieve a comprehensive and effective debriefing:

- *Gather* information about the events.
- *Analyze* the information by using an accurate record.
- *Summarize* the attainment of objectives for future improvement.

Structured elements include the 3 specific phases described in Table 2, while supported elements include both interpersonal support and the use of protocols, algorithms, and best evidence. Be sure to allow enough time to conduct a debriefing session after each case scenario.

Table 2. Structured and Supported Debriefing Process

Phase	Goal	Actions
Gather	Ask what happened during the case, to develop a shared mental model of the events. Listen to students to understand what they think and how they feel about the simulation.	<ul style="list-style-type: none"> • Request a narrative from the Team Leader. • Request clarifying or supplementary information from the high-performance team.
Analyze	Facilitate students' reflection on and analysis of their actions.	<ul style="list-style-type: none"> • Review an accurate record of events. • Report observations (both correct and incorrect steps). • Assist students in thoroughly reflecting on and examining their performance during the simulation as well as in reflecting on their perceptions during the debriefing. • Direct and redirect students during the debriefing to ensure continuous focus on session objectives.
Summarize	Facilitate identification and review of the lessons learned that can be taken into actual practice.	<ul style="list-style-type: none"> • Summarize comments or statements from students. • Have students identify positive aspects of their high-performance team or individual behaviors. • Have students identify areas of their high-performance team or individual behaviors that require change or correction.

You should view yourself as a facilitator whose goals are to enhance learning during the training session and encourage students to critique themselves and reflect on future clinical encounters. This promotes continued self-improvement and will have a long-lasting effect well beyond any individual course.

A good facilitator effectively uses the key skills of listening, genuine inquiry, and open-ended questions to determine how the student understood the situation and what he or she was thinking. Correcting a particular action will have an impact on only a single behavior; correcting an approach will affect the student's actions in a variety of situations.

Appropriate pauses and silence can give students the time they need to formulate their thoughts. Demonstrating the usefulness of protocols and algorithms is also part of an effective facilitation.

Structured and supported debriefing can help facilitate learning the skills and techniques needed for clinical practice. It is also important that you model and encourage good debriefing techniques because debriefing of actual resuscitation events can be a useful strategy to help healthcare providers improve future performance in clinical practice.

Contextual Learning

Another core concept for resuscitation training is to use training experiences that apply to students' real-world scope of practice.

- Consider that different students find relevance in different things and tailor the learning experience for the types of students, their settings, and the resources available in their environment.
- When simulating resuscitation, acknowledge that manikin fidelity is not enough and use manikin features that matter. These features should engage students and be relevant to the learning objectives.
- Enhance realism for team training by ensuring that team composition, roles, and contexts are right for your student groups.
- Don't be afraid to stress your students (to a certain extent). The right amount of stress can enhance experiential learning by maximizing student engagement.

Testing for Course Completion

The AHA requires successful completion of skills tests, as well as an exam in instructor-led courses or successful completion of the online portion of HeartCode, for a student to receive a provider course completion card.

The prompt and accurate delivery of provider skills and knowledge is critically important for patient survival. Accurate, objective, and uniform testing reinforces these lifesaving skills and knowledge and is critical for the consistent delivery of content by all instructors.

All AHA Instructors are expected to maintain high standards of performance for all skills tests, as discussed in the following sections.

Skills Testing

During skills testing, students must demonstrate competency in all skills without any assistance, hints, or prompting from the instructor.

Instructors of the appropriate discipline will evaluate each student for his or her didactic knowledge and proficiency in all core psychomotor skills of the course. No AHA course completion card is issued without the required skills testing by either an AHA Instructor for that discipline or an AHA-approved computerized manikin in an AHA eLearning course.

Students in advanced life support courses are not required by the AHA to have a current BLS Provider card, but they are expected to demonstrate proficiency in BLS skills. Training Centers do have the option to require a current BLS Provider card, but requiring the card does not mean that BLS content and testing may be omitted from advanced courses.

Skills Testing of Blended-Learning Students

Instructors may need to conduct skills practice and testing during the hands-on session of a blended-learning course. The lesson plans in Part 6 will help facilitate these sessions. The skills testing portion of the hands-on session should be conducted the same as in an instructor-led course. Some skills tests may require that additional students be present while the tests are being conducted (refer to Part 4 for further details).

Exam

The exam measures the mastery of cognitive knowledge in ECC instructor-led healthcare courses. Each student must score at least 84% on the exam to meet course completion requirements.

The AHA has adopted an open-resource policy for exams administered through an eLearning course or in a classroom-based course. Open resource means that students may use resources as a reference while completing the exam. Resources could include the provider manual, either in printed form or as an eBook on personal devices, any notes the student took during the provider course, the 2020 Handbook of ECC for Healthcare Providers, the AHA Guidelines for CPR and ECC, posters, etc. Open resource does not mean open discussion with other students or the instructor. Students may not interact with each other during the exam.

In the welcome letter you send to students with their course materials, emphasize the importance of bringing their books to class to use during the exam. Students using the eBook version should download the manual to their device's eReader app and bring it with them in case there is no Internet connection.

Exams are administered online, though there may be an occasional need to administer a paper exam. More information about exams can be found on the Instructor Network.

If you use a paper exam, grade the exam, and answer any questions as soon as the student returns it. Students who score less than 84% will need to take a second exam or receive verbal remediation to confirm knowledge and understanding. If you give a student a second

exam, review the first exam with the student, allowing them time to study the questions they got wrong. If you provide verbal remediation, ask the student to verbally answer the questions that he or she answered incorrectly, and document on the answer sheet whether the student correctly answered each question. You must document on the answer sheet that the remediation was successful, and that the student achieved a passing score.

If a student has difficulty reading or understanding the written questions, you may read the exam to the student. You must read the exam as written and in a manner that does not indicate the correct answer. You may verbally translate the exam if needed.

ECC blended-learning healthcare courses have a cognitive assessment incorporated into the online portion, so an exam does not need to be given to students when they attend the classroom portion.

Exam Security

Exam security is of the utmost importance:

- Ensure that all exams are kept secure and not copied or distributed outside the classroom.
- Exams are copyrighted; therefore, Training Centers or instructors may not alter them in any way or post them to any learning management systems such as Internet or intranet sites. This includes precourse self-assessments.*
- When a paper exam must be used, always print the most current version from the online exam platform for the course you are teaching.
- Each paper exam should be accounted for and returned to the instructor at the end of the testing period.

*Exams are translated into multiple languages. If a translated exam is needed for a course you are teaching, have your Training Center Coordinator contact ECC Customer Support to find out if the needed translation is available.

Remediation

Provider Course Student Remediation

At times, you will have to provide remediation to a student who is unable to perform satisfactorily in portions of the course. This is often resource-intensive and may require considerable expertise in communication and educational creativity.

The fundamental principle is that every student who is not able to master the required skills during the course is still able to benefit from remediation. The instructor should be committed to finding and using the proper techniques that will be effective for a student. Adult learning principles coupled with debriefing techniques usually make for an effective combination. Here are some suggestions:

- Review the objectives for a scenario or skills station with the student.
- Give positive feedback when desired actions are observed; ask open-ended questions when non-preferred actions are observed to determine the student's thought process.
- Use the same scenario repeatedly if necessary until the student accomplishes the objectives.

Consider using another instructor to provide remediation because that instructor might be able to offer an alternative approach that will be helpful for the student.

At the time of the course, remediation for some students might not be successful within certain sections of the course (or exam or skills tests). When this happens, the student may arrange for a separate remediation session. A student must meet all learning objectives to the satisfaction of the Course Director or Lead Instructor before receiving a course completion card.

Students must complete all remediation sessions, including exams, skills tests, and skills stations, within 30 days after the last day of the original course. The remediation date will be listed as the issue date on the course completion card.

If a student does not successfully complete all course requirements within 30 days, the course is considered incomplete and a course completion card will not be issued.

Remediation Concepts for Instructors

Remediation is a learning process in which the instructor provides additional opportunities for the student to master the required skills of the course.

Informal remediation occurs throughout the course and is part of the learning process. When a student is having difficulty mastering a skill, he or she can be placed last in line for performing skills for practice and/or testing. This gives the student additional time to observe and learn from other students.

Formal remediation occurs after a student has been formally tested in a skills or core case testing station and has been unable to demonstrate mastery. Have the student work one-on-one with an instructor during breaks, lunchtime, or at the end of the day to assess areas for improvement in performing a skill. Then, encourage the student to practice and, when ready, to indicate when he or she wishes to be tested.

It is important to communicate the need for formal remediation in a private, sensitive, and objective debriefing immediately after the testing has taken place by using the scenario critical action objectives as a guide.

- Every student, with rare exceptions, should be able to benefit from remediation.
- Commit to providing remediation for students who have difficulties learning the skills and principles in the course the first time through.
- Instructor styles of facilitating and student styles of learning may not match; therefore, a change of instructor may be necessary.
- Don't assume that poor performance is associated with a lack of knowledge. There may be other factors (eg, personal or work-related issues) that are influencing the student's performance.
- If a student is still having difficulty after receiving remediation, you may need to examine the student's style of learning and make adjustments.
- The role of the instructor is to facilitate learning. Always be respectful, courteous, positive, professional, and diplomatic when providing remediation to a student.

Additional materials to assist in remediation will be provided in a later section of the manual.

Steps to Successful Remediation

You may find these steps helpful when providing remediation:

- Review the critical action steps that the student did not perform satisfactorily.
- Using open-ended questions (debriefing tool), assess the student's thought process, and correct it if necessary.
- Identify whether other factors might have affected the student's performance (eg, performance anxiety).
- Use the same or a similar scenario for retesting the student (eg, if the initial scenario was a respiratory case, use a respiratory case again for the retest).
- Use other students who need remediation or other instructors to help form a high-performance team to manage the case scenario.
- If performance anxiety or an instructor-student personality clash is a factor, ask another instructor to conduct the remediation.

Instructors should make every effort to correct knowledge and skills deficits during the course. Doing so can help minimize the chances that students will require formal remediation at the end of the course.

After the Course

Program Evaluation

Ongoing evaluation and improvement of AHA materials and instructors are important to the AHA. Each student should have an opportunity to evaluate the class. As an instructor, it is your responsibility to provide that opportunity. There are several options for how a course evaluation can be provided.

- Paper evaluation: A template for a written evaluation is available on the Instructor Network. Make enough copies so all your students can complete the evaluation at the end of the course and return it to you. Review the feedback, and then send the completed forms to your Training Center Coordinator.
- eCard survey (United States): If you are an instructor with a US Training Center and your Training Center is issuing eCards, your students will complete an online evaluation before they claim their course completion card. eCard surveys are another important way to gain valuable feedback from your students on their overall satisfaction of the course. eCard Reports are available on the Instructor Network.
- Online evaluation (international): If you are an instructor with an International Training Center, your students are encouraged to complete an evaluation online before they can claim their CPRverify™ course completion card (eCard); in addition, instructors can have students complete the paper evaluation located on CPRverify.

Issuing Provider Course Completion Cards

Each student who successfully completes the course requirements will be issued an AHA course completion card (eCard or printed). More information can be found on the Instructor Network.

No AHA course completion card is issued without hands-on manikin skills practice and testing by an AHA-approved computerized manikin as part of an AHA eLearning course or by an AHA Instructor for that discipline.

Continuing Education/Continuing Medical Education Credit for Courses

Most ECC online and blended courses offer continuing education (CE)/continuing medical education (CME) credit and are designed to meet CE criteria. The CE/CME certificate is automatically generated when students complete a course and claim their credit. This may not be the same as the certificate of completion.

Some classroom courses also offer credit for EMS professionals. The AHA is contracted to offer all EMS students CE hours through the Commission on Accreditation for Prehospital Continuing Education (CAPCE). Because there are contractual obligations to make CAPCE credit available to all EMS professionals completing a qualifying course, your Training Center and you, as an instructor, are required to collect and submit the information requested: first name, last name, and email address. The submission is done through the Instructor Network. Each student is then sent an email invitation to provide the additional needed information and claim his or her credit. While the information for all EMS students must be submitted, students are not obligated to accept or claim their certificates.

CAPCE accreditation does not represent that the content of a course conforms to any national, state, or local standard or best practice of any nature.

If you would like to offer CE credit to other professionals who attend your instructor-led courses, you will need to work with your Training Center or employer to apply for credit through the appropriate authorizing body.

Visit the Instructor Network to learn which courses offer CE/CME credit and to find more information and updates.

Provider Renewal

Renewal Timeline

The current recommended timeline for renewal of an AHA course completion card is every 2 years. Although there is insufficient evidence to determine the optimal method and timing of retaking a course, research on skills retention and training show the following:

- There is growing evidence that BLS knowledge and skills decay rapidly after initial training.
- Studies have demonstrated the deterioration of BLS skills in as little as months after initial training.
- Studies examining the effect of brief, more frequent training sessions demonstrated improvement in chest compression performance and shorter time to defibrillation.
- Studies also found that students reported improved confidence and willingness to perform CPR after additional or high-frequency training.

Given how fast BLS skills decay after training, and with the observed improvement in skills and confidence among students who train more frequently, students should be encouraged to periodically review their provider manuals and practice skills whenever possible. In addition, instructors and Training Centers may offer opportunities for students to practice and test their skills between course events.

Instructor Training

Recruiting and Mentoring Instructors

You may have students in your course who want to become AHA Instructors. The AHA encourages you, as a current AHA Instructor, to take a moment to pass along this information to all students who are interested in becoming an instructor after they successfully complete the provider course.

An AHA Instructor course teaches the methods needed to effectively teach others. The AHA requires that instructors be at least 18 years of age to attend an AHA Instructor course.

Instructor Candidate Selection

The ideal instructor candidate

- Is motivated to teach
- Is motivated to facilitate learning
- Is motivated to ensure that students acquire the skills necessary for successful course completion
- Views student assessment as a way to improve individual knowledge and skills

Instructor Course Prerequisites

Prospective participants in an AHA Instructor course must

- Have current provider status in the discipline they wish to teach
- Have completed an Instructor Candidate Application (obtained from the Training Center Coordinator)

Receiving an Instructor Card

Your instructor card for your discipline is issued by your primary Training Center. This may not be the same Training Center where you took your training or monitoring.

All instructor cards are valid for 2 years.

If you are a new instructor:

- You must be monitored teaching your first course within 6 months after completing the classroom portion of your training. A current Training Faculty member for your discipline must monitor you while you teach an initial provider course or an update or renewal course. It is your responsibility to schedule this monitoring, working with the Training Faculty member who conducted your course or with the Training Center Coordinator of your Training Center.
- You will receive your instructor card from your Primary Training Center once you have successfully completed all monitoring requirements. The expiration date will be 2 years from the month you completed all requirements, including monitoring.
- You must register on the Instructor Network with your Primary Training Center so that you receive your instructor ID number. This number is placed on the back of your card, so you need it before your card can be issued. Any questions about receiving your instructor card should be directed to your Training Center Coordinator.

Instructor Renewal Criteria: BLS

Your instructor status must be renewed by a Training Faculty member. You can renew your BLS instructor status by meeting all of the following criteria or by successfully completing all requirements for a new instructor.

- Maintain current provider status. You can do this by maintaining a current provider card or by demonstrating exceptional provider skills to a Training Faculty member and by successfully completing the provider exam.

- If you choose the demonstration route, successful completion must be documented on the Instructor/Training Faculty Renewal Checklist. A new provider card may be issued at the discretion of the Training Center or if you request one, but it is not required by the AHA.
- Earn 4 credits during each 2 years of your instructor recognition by doing any combination of the following:
 - Teach an instructor-led BLS or Heartsaver® class. Each class counts as 1 credit.
 - Conduct the hands-on skills session for a blended-learning course. Each day of HeartCode BLS hands-on sessions or Heartsaver hands-on sessions counts as 1 credit.
 - Conduct BLS and AED skills testing during a Pediatric Advanced Life Support (PALS); Pediatric Emergency Assessment, Recognition, and Stabilization (PEARS®); or Advanced Cardiovascular Life Support (ACLS) class. One credit is awarded per class.
 - Facilitate a Family & Friends® class. Each class counts as 1 credit.
- Attend updates as required within the previous 2 years. Updates may address new course content or methodology and review Training Center, regional, and national ECC information.
- Be monitored while teaching before instructor status expiration. The first monitoring after the Instructor Essentials Course does not satisfy this requirement.

Special Exceptions to Teaching Requirements

The requirement for instructors to teach a minimum of 4 courses in 2 years to renew instructor status may be waived or extended under special circumstances. These circumstances include, but are not limited to, the following:

- Call to active military duty (for an instructor who is in the military reserve or National Guard). Monitoring during duty may be waived if Military Training Network Faculty members are not available
- Illness or injury that has caused the instructor to take a leave from employment or teaching duties
- A limited number of courses offered in an area because of lack of audience or delay of course materials

The Training Center Coordinator, in consultation with the assigned Training Faculty, may decide to waive the teaching requirements for the discipline in question. Consideration should be given to the amount of time an instructor is away from normal employment, the length of delay in release of materials, and the number of courses taught in relation to the number of teaching opportunities. Documentation supporting the decision must be maintained in the instructor's file. All other requirements for renewal must be met as stated previously.