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DEPARTMENT OF HEALTH

HeartRescue
PROJECT
PENNSYLVANIA

RESUSCITATION ACADEMY

DISPATCHER ASSISTED CPR

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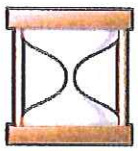
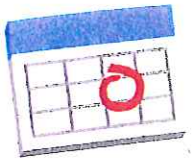
4 EMD Pre-arrival Instructions to Improve OHCA Survival
Learner et al

Implementation

Steps to launch and tips to stay afloat

Once you have received support and approval from leadership to implement a Dispatcher Assisted CPR Program, you are ready to begin. Every community will have a different approach depending on resources and logistics. Below is one implementation plan that can be used as a guide.

STEP	TASK	CONSIDERATIONS	
Step 1	Select Protocol		
Step 2	Schedule training date(s), location and instructors	Allow plenty of time. Communication centers often schedule shifts, overtime, months in advance. Several months of lead time may be needed to allow supervisors to arrange schedules for training.	
Step 3	Prepare training materials		
Step 4	Decide on launch date	Designate a date and time that dispatchers will begin to use the protocols. Make sure that everyone in the communication center knows when this will occur.	
Step 5	Plan QI Program		
Step 6	Conduct training	Training should be conducted as close launch date as possible. Material will be fresh for dispatcher on launch day.	
Step 7	Prepare press release and send to media	A consideration depending on your community.	
Step 8	Prepare for media contacts	Designate a Public Information Officer (PIO) to handle media requests. A fire department PIO may also be available. Most fire departments have PIOs that are accustomed to handling media inquiries.	

Step 9	Prepare protocols for comm center consoles	Protocols may be written or electronic. If written protocols are used, make sure they are in large font, easy-to-read, accessible and durable (tear proof and waterproof). There must be one copy for each working console in the communication center (include back up consoles).	
Step 10	Launch Day	If you have a large center and expect cardiac arrests on the first day or two, have training staff available in the communication center to act as advisors, answer questions and provide support. Anticipate some anxiety for the first month or so. Any activity related to life and death decisions can make employees anxious.	
Step 11	Begin QI activities	Begin reviewing calls as cases occur. There is no need to wait. The sooner feedback is provided, the more comfortable they will feel with delivering the instructions.	
Step 12	Evaluate Program at six months	Elicit input from dispatchers, EMS, and other stakeholders such as the Dispatch Review Committee.	
Step 13	Implement Continuing Education Plan	Select an existing dispatch continuing education program or develop one.	

Dispatcher Assisted CPR

Fact Sheet and Frequently Asked Questions (FAQs)

Facts

The rate of bystander CPR in King County, WA, increased from 32% (1976 through 1981) to 54% (1982 through 1988) after implementation of the dispatcher assisted telephone CPR program. [1]

Bystander CPR is currently performed on 49% of all cardiac arrests in King County, Washington.

Frequently Asked Questions (FAQs)

Can dispatchers do harm to a person in cardiac arrest by giving instructions over the phone?

If the patient is in cardiac arrest he/she is clinically dead and no further harm can be done to this person. Any attempt at CPR is more helpful than no attempt at all. A 2009 study in King County, WA, showed that even when the patient was not in cardiac arrest and the dispatcher instructed the bystander to do CPR, the chance of injury was very minimal. Of 247 patients who received CPR but were not in cardiac arrest, only 6 had potentially serious complications.

Should dispatchers be EMTs if they are going to deliver medical pre-arrival instructions?

No, dispatchers do not need to be EMTs to perform the duties of an EMD (Emergency Medical Dispatcher). EMDs receive 40 hours of basic training and learn the skills to deliver CPR instructions and other pre-arrival instructions for medical care. Much of the EMT training in Basic Life Support is practical training and includes wound care, splinting, assessing medical emergencies and extrication.

Should dispatchers be trained in CPR?

Yes, learning to perform CPR will help them provide DA CPR instructions, but this training is not required and is not a part of the EMD training curriculum. You may choose to make CPR training a pre-requisite to EMD training. All citizens should be trained to perform CPR regardless of their occupation.

What if the caller does not want to do CPR?

If the caller does not want to do CPR with dispatcher assistance then let them know that responders have been notified and ask them to lay the patient on their side in order to avoid any aspiration or further issues with the patient's airway. The caller should not be made to feel guilty about their refusal however sometimes potential rescuers don't understand that the dispatcher will guide them through the tasks and it is only to help the patient until the responders arrive.

What if the caller already knows how to perform CPR or is already doing it?

If you are comfortable that they can proceed without assistance you can have them keep the line open and proceed with the CPR. We find that often callers still want some reassurance with their CPR or we need to adjust their rate of compressions because they are not going fast enough.

Won't the dispatchers feel bad if the patient ends up passing away even though they gave instructions in a timely manner?

Basic training and continuing medical education should include components related to survival and other elements of patient outcomes. This will hopefully help the dispatchers understand that CPR instructions, when given promptly without delay, can increase the possibility of the patient's survival, but there are many other factors associated with the outcome for the patient. Open communication and peer support can assist dispatchers when dealing with these kinds of feelings or insecurities.

What if the caller cannot get the patient into the correct position to do DA CPR?

Undoubtedly, dispatchers may receive calls where the patient is wedged or in a position where the potential rescuer cannot move them. There might also be times where it would not be safe for the rescuer to attempt to move the patient due to their own safety issues. In each of these instances, it is best to have the caller attempt to open the airway of the patient and prepare for the responders arrival (opening front door, placing dogs in area that will not inhibit the rescue attempt, etc.). Placing the caller in a position where they are at risk of injury is not an option.

However, basic training will include options for callers faced with patients in a recliner, on a bed, at the dining table, in a bathtub etc. Dispatchers should use their knowledge and skills from training to make every attempt to get a patient flat on their back on the floor and begin compressions. Training should include a component on the importance of positioning as well as some ways to overcome some of those issues.

Most patients in cardiac arrest die anyway or never regain full function and health, so why bother putting the work and effort into such a complex program?

Although many patients who experience cardiac arrest die, in many areas, including King County, survival rates can approach or exceed 50%. Even if the survival rate in your area is lower, every patient saved by DA CPR is someone's father, mother, daughter, son, or other family member. Saving even one patient can be a highlight of a dispatcher's career and a life-altering event for the patient's family.

POSITION PAPER

EMERGENCY MEDICAL DISPATCH

APPROVED BY THE NAEMSP BOARD OF DIRECTORS NOVEMBER 20, 2007

POSITION STATEMENT

The National Association of EMS Physicians believes that:

- Tested knowledge and demonstrated skills in the area of basic telecommunications should be requisite for all emergency telecommunicators. Further training to the level of emergency medical dispatcher should be required for all personnel who receive calls for medical assistance and/or dispatch those resources. Governments should approve statutes or regulations that require Emergency Medical Dispatchers (EMDs) to be certified/licensed in accordance with nationally accepted standards for emergency medical dispatch.
- The use of formal, medically approved EMD protocols should be required for the practice of emergency medical dispatching. In all EMS systems, prioritization of calls to be dispatched should be an essential element.
- The provision of prearrival instructions should be a mandatory function of every EMD in a center that interrogates callers and prioritizes medical calls. Prearrival instructions should take into account the dispatch-specific (i.e., nonvisual, nonpretrained caller) circumstances of providing standard basic life support and/or advanced life support procedures and care to callers, known as dispatch life support.
- The "medical service" in EMS begins when a public call is received at a public safety answering point or other agency that provides prehospital emergency care in response to requests for unscheduled medical assistance. All centers servicing requests for medical assistance should have medical oversight by a physician medical director, with knowledge at least to the level of a certified EMD, who is responsible for all medical aspects of the EMD program by which these calls are processed.
- Quality improvement and risk management activities should include oversight of call-taker compliance with protocols, including levels of protocol use reliability and consistency. These are essential for effective, safe, and risk-averse medical dispatch operations.
- EMD medical directors should participate in the design, operation, and data analysis of medical dispatch, and data-based programs for community injury and disease surveillance, wherever these programs are possible to implement.
- Investigation of the need for, and the safety and potential effectiveness of, expanded service options as an alternative to dispatching resources to the scene should be a medical director responsibility.
- Research designed to improve EMD should focus on the specific components of the process (e.g., interrogation questions, dispatch prioritization descriptors, postdispatch instructions, prearrival instructions, and safety element advisories) and/or their relationships.

These positions are revisions of those in the 1989 NAEMSP position paper: Emergency medical dispatching. *Prehosp Disaster Med.* 1989;4(2):163–166.

MeSH Search Terms:
Emergency medical services
Emergency medical service communication systems
Emergency medical technicians
Quality assurance, health care
Risk management

AHA Scientific Statement

Emergency Medical Service Dispatch Cardiopulmonary Resuscitation Prearrival Instructions to Improve Survival From Out-of-Hospital Cardiac Arrest

A Scientific Statement From the American Heart Association

Endorsed by the Association of Public-Safety Communications Officials International, International Academies of Emergency Dispatch, National Academies of Emergency Dispatch, National Association of Emergency Medical Technicians, National Association of EMS Physicians, and National Association of State EMS Officials

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Each year, millions of people around the world experience out-of-hospital cardiac arrest (OHCA), a condition characterized by unexpected cardiovascular collapse.[1,2] OHCA is a leading cause of death. The incidence of treated OHCA is ≈50 to 60 per 100 000 person-years and is comparable throughout many parts of the world. Resuscitation of these patients is challenging and requires a coordinated set of rescuer actions termed the "Chain of Survival." The links in the Chain of Survival are immediate recognition of cardiac arrest and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), rapid defibrillation, effective advanced life support, and integrated post–cardiac arrest care.[3] These actions involve the participation of a spectrum of rescuers, including family members, bystanders, emergency medical service (EMS) dispatchers, pre–hospital care providers, and hospital-based personnel; each group of rescuers has specific motivations, responsibilities, and skills. Unfortunately, in most communities in the United States and Canada, only 5% to 10% of all OHCA patients in whom resuscitation is attempted survive to discharge from the hospital. In contrast, survival rates can approach 20% (50% for witnessed ventricular fibrillation) in communities where the Chain of Survival is strong.[4]

Efforts to improve survival from OHCA should be aimed at strengthening each link in the Chain of Survival. An important underpinning of successful resuscitation is the interdependence of each of these links. Specifically, the early links, those involving bystanders (immediate emergency activation and early bystander CPR), are essential for the effectiveness of subsequent links. Thus, efforts that can improve early recognition of OHCA and increase bystander CPR are likely to improve survival from OHCA.

When a bystander calls the community emergency response number (eg, 911 in the United States) to request

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medical aid, the call creates an opportunity to improve both identification of OHCA and provision of bystander CPR. This telephone interaction is the initial interface between citizens at the scene and professional emergency responders and can serve as the catalyst for recognition of cardiac arrest and initiation of bystander CPR through formal interrogation of the caller and "just-in-time" education. Just-in-time education in the form of telephone CPR instructions, referred to as CPR prearrival instructions, can provide callers with step-by-step instructions on how to perform CPR. Unfortunately, prearrival instructions are not available to all callers who access the emergency response number. It is difficult to estimate the exact number of lives that could be saved by offering CPR prearrival instructions, but it has been shown that CPR prearrival instructions can potentially double the proportion of arrest patients who receive bystander CPR and in turn help communities achieve bystander CPR in the majority of arrest patients who collapse before EMS arrival.[5] The survival effectiveness of CPR guided by prearrival instructions appears to approach that of CPR provided by previously trained bystanders.[6] Therefore, based on the estimate that annually nearly 200 000 of the 300 000 OHCAs that occur in the United States do not receive bystander CPR, more comprehensive implementation of CPR prearrival instructions has the potential to save thousands of additional lives each year.[7]

This scientific statement reviews the process of providing CPR prearrival instructions, identifies these instructions as integral to the Chain of Survival, and describes the framework for programmatic best practices for providing CPR prearrival instructions. The statement also emphasizes the importance of monitoring dispatcher performance and providing regular feedback. Specifically, this scientific statement makes 4 main recommendations:

1. Callers to community emergency response numbers (eg, 911) should be formally and systematically questioned to determine whether the patient may have had a cardiac arrest. When a potential cardiac arrest patient is identified, CPR prearrival instructions should be immediately provided to assist bystanders if CPR is not already ongoing.
2. CPR prearrival instructions should be provided in a confident and assertive manner and should include straightforward chest compression–only instructions to achieve early bystander Hands-Only CPR for the adult who suddenly collapses.
3. Individual dispatcher and organizational-level performance can be measured by using a modest set of metrics that can be ascertained through review of the audio dispatch recording.
4. These metrics should be incorporated into an integrated quality assurance program that includes cooperation and collaboration of EMS and hospital stakeholders. The program should provide feedback at the individual and organizational level.

Current American Heart Association Guideline for EMS Dispatch for an Adult Who Collapses Suddenly

The *2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care* recommend that bystanders immediately call their local emergency response number anytime they find an unresponsive patient and that all dispatchers be appropriately trained to provide CPR prearrival instructions. To deliver effective CPR prearrival instructions, dispatchers should be specifically educated in helping the bystander recognize absent or abnormal breathing to identify the cardiac arrest condition and initiate CPR (Class I, Level of Evidence B). Furthermore, dispatchers should recommend CPR for unresponsive patients who are not breathing normally, because many are in cardiac arrest, and the frequency of serious injury from chest compressions in the nonarrest group is very low (Class I, Level of Evidence B). For adults with sudden cardiac arrest, dispatcher prearrival CPR instructions should consist of Hands-Only CPR (Class I, Level of Evidence B). However, CPR instructions should include rescue breathing when treating adult and pediatric patients with a high likelihood of an asphyxial cause of arrest (eg, drowning). Finally, the EMS system quality-improvement process should include a review of the performance of dispatcher CPR instructions (Class IIa, Level of Evidence B).[8]

Bystander CPR

Bystander CPR is a vital intervention for patients with OHCA. Although bystander CPR can more than double the patient's chance of survival, in many communities fewer than one-third of OHCA patients receive this lifesaving action before the arrival of EMS.[2,9] The low incidence of performance of bystander CPR contributes to poor survival rates in most communities. Despite large-scale training efforts, bystander CPR rates have historically remained low. The reasons for this low rate of bystander CPR include, but are not restricted to, difficulty in identifying cardiac arrest, fear of causing harm, the challenge of performing this complex psychomotor task, bystander emotional distress and panic, and bystander reluctance to engage in mouth-to-mouth contact because of perceived unpleasantness or fear of disease transmission.[10–14] Because the impact of each of these factors may vary across communities, the most efficient and effective set of strategies to increase the performance of bystander CPR may be a coordinated community approach, including public awareness, frequent and ongoing public CPR training, and a structured CPR prearrival instruction program.

The interaction between a bystander who calls an emergency response number to request aid and the dispatcher who takes the call creates an opportunity for the dispatcher to help the caller provide aid and successfully guide the caller past many of the impediments to achieving early bystander CPR. The process includes guiding the caller to identify the arrest, easing the caller's fear and panic, and directing the caller to begin and continue the psychomotor skills of CPR. CPR prearrival instructions cannot provide the details presented in a formal CPR training course, but they should provide the best balance of implementation and efficacy, especially when the alternative is no CPR.

Telephone Prearrival Instructions for Bystander CPR

Effective CPR prearrival instruction programs can nearly double the rate of bystander CPR performed.[5,10,14] Even in

communities where the EMS response is exceptionally quick, a structured CPR prearrival instruction program can provide a measurable benefit.[15] Importantly, bystander CPR that results from provision of prearrival instructions can offer a survival benefit comparable to that of unassisted bystander-initiated CPR.[6]

Because of its ubiquitous position in the emergency medical response system, EMS dispatch has an enormous opportunity to provide lifesaving CPR instructions to the public. In contrast to most other forms of resuscitation training and knowledge translation, dispatchers are in direct communication with actual bystanders to cardiac arrest. Dispatchers have a unique opportunity to provide a real-time, high-yield intervention that can have a direct and immediate impact on the survival of the patient with OHCA. Furthermore, the general public expects dispatchers to direct their actions while they wait for help to arrive.[16]

Not all EMS dispatch centers offer CPR prearrival instructions. The exact number of dispatch centers within the United States that provide CPR prearrival instructions or transfer callers to receive instruction is unknown.

Facilitating Bystander Recognition of a Patient With Cardiac Arrest

The first and most fundamental step in prearrival CPR instruction is for the bystander and dispatcher to recognize a potential cardiac arrest. Many patients with cardiac arrest do not receive bystander CPR because the arrest is not recognized. A patient's movements are often misinterpreted as signs of life; these are most commonly some form of respiratory effort.[10,13,14,17] Although patients with cardiac arrest are uniformly unresponsive, up to half initially present with agonal gasps early after collapse.[18] These gasps represent a brain stem response to ischemia and can persist for several minutes.[18] Not surprisingly, callers/bystanders will describe gasping, deep snoring, or slow breathing, which may prevent the identification of cardiac arrest (www.heart.org/dispatchercpr). There are currently no scientifically proven methods for helping callers and dispatchers accurately identify agonal gasping, but the abnormal respirations associated with cardiac arrest may be characterized as any form of abnormal breathing in the unresponsive patient.[8]

Another condition that can make it difficult to recognize a cardiac arrest is brief seizurelike activity (shaking) that occurs immediately after collapse from cardiac arrest.[19] Dispatchers should be aware of this presentation and its potential to inhibit the recognition of arrest.

One key to early recognition is for dispatchers to use a systematic, streamlined set of questions at the beginning of the call.[19a] A 2-question approach can efficiently achieve this goal (Figure 1), although no single identification strategy will identify all cardiac arrests.[20] If the patient is determined to be unresponsive and not breathing or not breathing normally, then the presumptive diagnosis is cardiac arrest and CPR prearrival instructions should be provided to the caller. The initial emergency call receiver should provide CPR prearrival instructions whenever possible or transfer the call to other dispatch personnel who are responsible for this action and will provide instructions. CPR prearrival instructions should be provided by designated dispatch personnel with minimal delay.

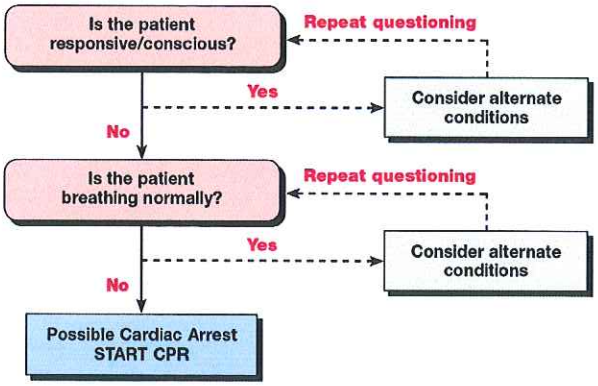

Figure 1. Sample algorithm for identification of a patient with possible cardiac arrest. CPR indicates cardiopulmonary resuscitation.

In some instances, the caller may be uncertain when responding to whether the patient is responsive or breathing normally, or the caller may not know how to make these assessments. In such cases, the dispatcher will need to be prepared to direct the caller with instructions on how to determine responsiveness and assess for normal breathing. For example, the dispatcher may need to follow the question about responsiveness by telling the caller to tap the patient on the shoulder and shout to see if the patient responds. The dispatcher may also ask if the patient appears to be "awake." To assess for normal breathing, the dispatcher may need to ask the caller to state each time the patient takes a breath to distinguish normal from abnormal (agonal) breathing. The dispatcher may ask if the patient's chest appears to be rising and falling normally, or the dispatcher may ask the caller to put the phone next to the patient so that the dispatcher can listen to the patient's breathing. In some cases of cardiac arrest, the caller may initially state that the patient is responsive and that breathing is normal; however, subsequent information may not be consistent. For example, the caller may state that the patient is conscious but later say that the patient is not breathing. Therefore, the dispatcher should continue to consider the possibility of cardiac arrest, especially when information is inconsistent or an alternative condition is not identified.

Asking questions about the patient's acute condition or long-term health history before asking questions meant to identify cardiac arrest may delay bystander actions by precious minutes and significantly reduce the likelihood of successful resuscitation. Therefore, dispatch protocols should be designed to identify cardiac arrest as early in the interrogation process as possible.

Engaging the Bystander to Provide CPR

CPR prearrival instructions can play a key role in engaging hesitant bystanders to provide CPR. Both the caller and dispatcher alike may be reluctant to initiate CPR because of the fear of causing injury, especially if their training is limited or if they are uncertain about whether the patient is in cardiac arrest.[21]

1. Bring the phone and get **NEXT** to the person if you can.
2. Listen carefully. I'll tell you what to do.
   - Place the person **FLAT** on his **back** on the **floor.**
   - **KNEEL** by the person's side.
   - Put the **HEEL** of your **HAND** on the **CENTER** of the person's **CHEST.**
   - Put your **OTHER HAND ON TOP** of **THAT** hand.
   - **PUSH DOWN FIRMLY, ONLY** on the **HEELS** of your hands, at least **2 inches.**
   - Do this **50** times, just like you're **PUMPING** the chest. Count **OUT LOUD: 1-2-3**.....**50** (correct rate if needed)
   - **KEEP DOING IT: KEEP PUMPING** the **CHEST UNTIL HELP TAKES OVER.** I'll stay on the line.

Ventilation instructions *(for use after 30 compressions when suspected cardiac arrest is secondary to respiratory arrest):*

PINCH the **NOSE;** with your other hand, **LIFT** the **CHIN** so that the head **TILTS BACK.**
Completely **COVER** the person's **MOUTH** with your **MOUTH.**
GIVE 2 BREATHS (come back to the phone).

Then go back to the compression instructions. *Give cycles of **30** compressions and **2** breaths* until EMS arrives.

Figure 2. Example of cardiopulmonary resuscitation prearrival instructions for an adult who has suddenly collapsed. EMS indicates emergency medical service.

Other conditions, such as seizures, hypoglycemia, or intoxication, can be present with unresponsiveness and abnormal breathing. In nearly half of all cases in which dispatchers provide CPR prearrival instructions, the patient will not be in cardiac arrest.[22] Serious injury from bystander CPR for people not in cardiac arrest is uncommon (≈1%–2%),[22,23] but failure to provide bystander CPR to people who are in cardiac arrest can be lethal. Bystanders and dispatchers should be assured that the balance of benefit versus risk greatly favors an assertive approach to beginning CPR whenever a patient is determined to be unresponsive and not breathing or not breathing normally.[22]

A major predictor of bystander action is the belief of bystanders that they can successfully perform lifesaving skills.[24] Confidence in performing CPR can be influenced by previous training and experience. The circumstances of cardiac arrest are typically unexpected, and bystanders may not have had training in responding to such circumstances, so they feel unprepared to act.[25] In addition, the bystander is frequently a family member of the patient, a circumstance that can add to the bystander's emotional distress. The key to overcoming bystander distress and uncertainty is for the caller to be engaged through CPR prearrival instructions that direct action and convey teamwork and assurance. For example, rather than asking the caller, "Would you like to try CPR?" the dispatcher should calmly and confidently state, "We need to start CPR. I will help you." Furthermore, if the caller is concerned about harming the patient, he or she should be told that CPR can only help and will not cause harm. The use of a communication strategy that conveys leadership and confidence may help the bystander focus on the task of CPR.[24]

Core Content of CPR Prearrival Instructions

A related challenge to bystander CPR may be the difficulty of coordinating multiple psychomotor skills, especially when dispatcher assistance is required. A primary benefit of CPR for adults is the generation of blood flow to the brain and heart during cardiac arrest. Therefore, CPR prearrival instructions for adults who suddenly collapse should be for Hands-Only CPR. That is, the caller should be instructed to provide rapid, forceful chest compressions with minimal interruptions (examples can be found at www.handsonlycpr.org or www.learncpr.org). Three previously published randomized clinical trials compared CPR prearrival instructions consisting of dispatcher-assisted compression-only CPR with dispatcher-assisted conventional CPR among adult patients with cardiac arrest, and the results support this recommendation.[26–28] These trials indicate that Hands-Only CPR provides at least comparable survival benefit overall and may be superior for adults who have a witnessed arrest of cardiac pathogenesis. CPR prearrival instructions for performing Hands-Only CPR enable the rescuer to start chest compressions on average a minute sooner than with conventional CPR and substantially simplifies CPR prearrival instructions and bystander action.[17]

Although the main objective of the dispatcher is to rapidly identify the patient with cardiac arrest and start chest compressions as soon as possible, some patients will likely benefit from the addition of rescue breaths to high-quality chest compressions performed with minimal interruptions. These groups predominantly include children (1 year of age until puberty) and adults with a high likelihood of an asphyxial cause of arrest (eg, drowning). On the basis of the interrogation, if the dispatcher suspects that there is a high likelihood that asphyxiation is the cause of the arrest, then conventional CPR (chest compressions plus rescue breaths) prearrival instructions can be provided,[26–29] but significantly delaying the initiation of chest compressions while trying to determine the precise cause of the arrest is suboptimal. Any CPR is substantially better than no CPR, and Hands-Only CPR will provide at least comparable benefit in the large majority of arrest patients.[27,30,31] Furthermore, for the majority of adults who suddenly collapse, the cause is cardiac related.

CPR prearrival instructions should direct the bystander to position the patient whenever possible on a firm surface on his or her back. The bystander should then be instructed in proper hand placement on the patient's chest and the proper method for giving chest compressions. Figure 2 provides an example of the steps that can be described to the caller.

Prearrival instructions should convey to the bystander that they should push hard and fast on the patient's chest with the goal of compressing at a rate of at least 100 times per minute at a depth of at least 2 inches. The optimal word choice to achieve this CPR performance is not well established. For example, the instruction to count out loud for a total of 50 compressions shown in Figure 2 was derived from practical experience. The creators of this sample instruction set felt that having the bystander return to the phone after 50 compressions gives the bystander an explicit goal and an opportunity for the dispatcher to reassess patient responsiveness, reassure the bystander that he or she is helping the patient, and redirect the rescuer regarding technique (eg, to increase the rate of compressions). Case examples of CPR prearrival instructions can be found at www.heart.org/dispatchercpr.

Measurement: The Key to a Successful CPR Prearrival Instruction Program

The cornerstone of success in resuscitation from cardiac arrest is accurate and consistent measurement of each link in the Chain of Survival. Integration of EMS dispatch into this process is essential. The core of the evaluation process is ensuring that all callers who receive instructions on rendering first aid to cardiac arrest patients receive direct, clear, and consistent CPR instructions that help them recognize cardiac arrest and immediately begin and continue CPR until trained rescuers arrive on the scene.

An effective OHCA system of care should integrate CPR prearrival instruction into the overall EMS system, which includes the public, trained EMS personnel, hospitals, and public health programs. In many communities, the OHCA system of care may also include public safety personnel such as law enforcement or other nonmedical first responders who frequently arrive at the patient's side before trained medical rescuers. This system integration ensures that all public safety providers work together with a common goal of rapidly identifying cardiac arrest patients and immediately initiating CPR (and early defibrillation if available) before EMS arrival. Ongoing measurement and improvement of each component of the system is essential to achieve optimal survival.[32]

Metrics

Core metrics designed to evaluate and improve dispatch and CPR prearrival instructions for cardiac arrest care include appropriate dispatch of EMS response, dispatch recognition of the arrest, and dispatcher-assisted CPR. Each of these categorical domains involves a time-sensitive component that becomes relevant on successful completion of the categorical measure (Table). The quicker the bystander starts CPR after collapse, the greater the patient's chance of survival, so time components are an important part of the metric.[33]

Current evidence indicates that there are important opportunities for dispatch to increase early identification of arrest and provision of bystander CPR.[11] Best-practice benchmarks for the core metrics are not well established and are derived from a few dispatch centers with a concerted focus on improving dispatcher care for cardiac arrest. In such systems, up to 25% of all patients with cardiac arrest receive bystander CPR.[5] It is also important to measure and try to minimize the time from call receipt to arrest recognition and the initiation of CPR prearrival instruction. Experienced dispatch centers have demonstrated that this interval can be reduced to ≈60 seconds.[5,17] Tracking patients with cardiac arrest to determine which cases dispatchers accurately identified and which were "missed" is a key part of the evaluation process. Because resources and systems vary widely, each dispatch organization should establish local benchmarks and continuously strive for improvement. Although perhaps sensitive, public reporting of these dispatch measures may help efforts to improve care and maximize the lifesaving potential of CPR prearrival instructions.

Table. Metrics for Evaluation of Dispatch and CPR Prearrival Instructions

Categorical Measure	Time Component
Dispatch of appropriate EMS resources	Interval from receipt of call to EMS dispatch
Adherence to the identification algorithm	Interval from receipt of call to completion of algorithm
Recognition of arrest/provision of CPR prearrival instructions	Interval from receipt of call to provision of CPR instructions
Performance of bystander CPR	Interval from receipt of call to performance of CPR
Primary obstacle to CPR	. . .

CPR indicates cardiopulmonary resuscitation; EMS, emergency medical services.

A vital aspect of review is to understand why bystander CPR is delayed or not initiated. Scene circumstances and bystander abilities are far ranging in cardiac arrest; in some instances, challenges to CPR may be nearly impossible to address, whereas in others there may be dispatch solutions. Careful review of local barriers to bystander CPR will provide insight into specific obstacles and aid in developing approaches to improve the process.[10–12,17] Important examples of changes that have occurred in some dispatch centers as a consequence of regular case review include the appreciation that early identification must account for agonal gasping, that ventilation instruction and actual performance came at a cost of 1 to 2 minutes delay until chest compressions, and that bystanders are more likely to act when the dispatcher directs the caller, instead of asks the caller, to start CPR.

Dispatcher Feedback

Individual dispatchers need both recognition and feedback on their performance in responding to cardiac arrest. Feedback should include basic points about the call, such as (1) whether the dispatcher recognized the need for CPR early in the call, (2) if the instructions were clearly and promptly stated, and (3) if the bystander provided CPR. This feedback helps identify trends and the need for additional training and scripting. In addition, review of individual audio recordings of cases where CPR prearrival instructions were or should have been provided is a valuable tool to assess the quality of verbal instructions and opportunities for improvement. Individual feedback should be complemented by organizational-level benchmarking that informs the dispatch center about the metrics of the program. Ideally, this information should be sup-

plemented with the ultimate metric, patient outcome data, so that dispatch organizations can measure and receive feedback about the effectiveness of their efforts.

Practical Considerations

An effective quality assurance program for CPR prearrival instructions requires the investment of resources. Each dispatch organization should determine the best programmatic approach to improve dispatch care for OHCA in its setting. Dispatch centers and EMS systems should work together to establish agreed-on CPR prearrival instruction protocols, training, measurement, and ongoing quality-improvement plans. Initial and ongoing CPR instruction training should review the practical challenges and tools to address these challenges. Such training would incorporate best practices derived from the local quality-assurance effort. Ideally, with medical direction oversight, the dispatch quality-assurance program would review all OHCA calls. Because in some instances dispatch cannot confirm OHCA, whenever possible, dispatch should use field EMS information to comprehensively identify OHCA cases. Field EMS organizations should collaborate with dispatch centers to share data and to measure and improve care. The most important source of information for EMS dispatch case review is the dispatch audio recording. Additional information from the EMS report or hospital outcome can also be useful. Dispatch leadership should provide organizational- and individual-level feedback about performance on the evaluated metrics. It is also important to acknowledge exceptionally good performance.[34]

Knowledge Gaps

The most effective means of identifying OHCA and providing prearrival instructions over the telephone is an area that can be improved with additional research. Several knowledge gaps exist on the topics of bystander CPR and CPR prearrival instructions. The word choice and terminology of dispatcher questions may affect the sensitivity and specificity of identification of arrest. Additional evidence can help direct efforts to motivate callers to initiate CPR and overcome specific barriers (eg, language barriers[35]) regardless of prior CPR training. Different instruction or word selection by the dispatcher may affect the timing and quality of bystander CPR. Investigation may also identify the best strategies to align the content of CPR (ie, addition of rescue breaths) with the patient's physiological status. Research is required to determine if and how to optimally integrate public access defibrillation into emergency dispatch and the CPR instruction process.[36] Finally, programmatic efforts should evaluate the most effective quality-assurance approaches; to date, there is limited research on best practices and bench marks for quality assurance.

Summary

Dispatchers should systematically interrogate all callers to identify cardiac arrest. When a potential cardiac arrest is identified, CPR prearrival instructions should be provided. Dispatcher performance should be monitored and formal feedback provided. Implementing telephone prearrival CPR instructions can significantly strengthen the Chain of Survival and save lives from OHCA.

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Author Disclosures

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E. Brooke Lerner	Medical College of Wisconsin	None	None	None	None	Serves on the following advisory boards. I do not consider any of these to be relevant to this project. No financial support is received for any of these activities. Associate Editor: Prehospital Emergency Care* Associate Editor: Academic Emergency Medicine* Associate Board: Disaster Medicine and Public Health Preparedness* Medical Advisory Board Member: Brain Trauma Foundation, National Disaster Life Support Foundation, National Disaster Life Support Education Consortium Executive Committee*	None
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Bentley J. Bobrow	Maricopa Medical Center Arizona Department of Health Services, Bureau of EMS & Trauma System	None	None	None	None	None	None
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Marc Gay	Centre de Communication Santé Estrie	None	None	None	None	None	None
Lana M. Gent	American Heart Association	None	None	None	None	None	None
Greg Mears	UNC Chapel Hill	None	None	None	None	None	None
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Robert E. O'Connor	University of Virginia Health System	None	None	None	None	None	None
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Robert A. Swor	William Beaumont Hospital	None	None	None	None	None	None
Andrew H. Travers	Emergency Health Services	None	None	None	None	None	None

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*Modest.

†Significant.

Reviewer Disclosures

Reviewer	Employment	Research Grant	Other Research Support	Speakers' Bureau/Honoraria	Expert Witness	Ownership Interest	Consultant/Advisory Board	Other
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Venugopal Menon	Cleveland Clinic	None	None	None	None	None	None	None
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Notes

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