



Continuing Medical Education - News & Information

November 2010 - Volume 16, Issue 11

Multi-Agency Edition

From the Editor

New Mandatory REMAC Credentialing Fee

A new \$25 fee has been instituted by NYC REMAC for all new or recertifying paramedic credentials. On successfully completing a REMAC exam, candidates will receive a temporary letter verifying certification. They will soon after be mailed a memo directly from NYC REMSCO requiring a completed application, proof of NY State paramedic certification, and credentialing fee by money order only. On receipt, a permanent NYC REMAC certification card⁷ will be issued.

Please direct inquires on this process to NYC REMSCO at 212-870-2301

Important Change to Protocol Updates

A new protocol update schedule has been adopted for both the field and the certification process. Rollouts now take place only once per year. The final version will be published January 1, beginning a three month training period. The new protocols are then implemented for all agencies on April 1.

During January, February and March, only the prior version is in effect, not the new April protocol changes. Only on April 1 will the new version be available for use in the field and on certification exams.

Exceptions make take place when it is urgent that a specific life-saving treatment be available right away. In such a case, the change would be implemented on a selected date for both the field and REMAC exams.

Always see nycremsco.org for the current approved protocols.

REMEMBER: the protocols on the street are the protocols on the exam!

Inside this issue:

(bold = new content)

From the Editor	1
Protocol Revisions	2
Cert & CME info	3
FDNY contacts	4
OLMC physicians	4
CME Article	5
CME Quiz	20
Citywide CME	23
Exam Calendar	24

Journal CME Newsletter

Published monthly

FDNY - Office of
Medical Affairs

9 Metrotech Center 4th fl
Brooklyn, NY 11201

718-999-2671

swansoc@fdny.nyc.gov

Effective April 1, 2010, NYC REMAC protocol revisions are to be implemented by paramedics updated by their Medical Director.

Per REMAC, ambulance services in NYC are responsible to provide copies of the protocols to their personnel. REMAC Advisories and Protocols are available to all at www.nycremsco.org

After April 1, only the April 2010 protocols may be used in the field and on NYC REMAC exams.

Questions may be referred to the REMAC Liaison at swansoc@fdny.nyc.gov or 718-999-2671.

Outline of April 2010 NYC REMAC protocol changes

see REMAC Advisory 2010-01 at nycremsco.org:

General Operating Procedures

- Oxygen Admin: removes respiratory rate as criterion for ventilation; removes mouth-to-mouth & mouth-to-nose ventilation
- Prehospital sedation: adds etomidate for cardioversion and pacing
- Communication with Medical Control: removes 20 minute on-scene time limit

BLS Protocols

- 401 Resp Distress: removes respiratory rate as criterion for ventilation; removes mouth-to-mouth & mouth-to-nose ventilation
- 407 Wheezing: adds epinephrine under Standing Orders with repeat Medical Control Option
- 410 Anaphylaxis: changes initial epinephrine dose to Standing Orders
- 421 Head & Spine Injuries: clarifies criteria for immobilization
- 423 Chest Injuries: removes bulky dressings for flail segments
- 425 Bone & Joint Injuries: note to request ALS for pain management; clarifies traction splint for closed injuries
- 428 Burns: note to request ALS for pain management; clarifies bandaging by BSA
- 430 EDP: note to request ALS for sedation
- 431 Heat-related Emergencies: removes saline PO

ALS Protocols

- 500-A Smoke Inhalation & 500-B Cyanide Exposure: clarifies sodium thiosulfate preparation
- 502 Obstructed Airway: removes needle cricothyroidotomy; adds procedure for right-mainstem bronchus displacement
- 503 Non-traumatic Arrest: removes reference to paddles
- 503-A V-fib/V-tach: changes joule setting
- 503-B PEA/Asystole: adds dextrose administration
- 504 Suspected MI: adds prompt OLMC contact; changes transport prior to IV admin
- 505-A, B & C Dysrhythmias: removes biphasic
- 505-D Brady Dysrhythmias: removes epi drip
- 506 APE: changes furosemide to Medical Control Option
- 510 Anaphylaxis: removes epi drip
- 521 Head Injuries: clarifies use of hyperventilation
- 540 Severe Pre-Eclampsia/Eclampsia: renames protocol; removes treatment for post-partum hemorrhage
- 551 Peds Obstructed Airway: removes needle cricothyroidotomy; adds procedure for right-mainstem bronchus displacement
- 554 Peds Asthma: clarifies ipratropium use
- 555 Peds Anaphylaxis: removes epi drip

Appendices

Appendix N Needle Cricothyroidotomy: deleted

REMAC Exam Study Tips

REMAC candidates have difficulty with:

- * Epinephrine use for peds patients
- * 12-lead EKG interpretation
- * ventilation rates for peds & neonates

REMAC Written exams are approximately:

- | | |
|------------------|-----------------------|
| 15% Protocol GOP | 40% Adult Med. Emerg. |
| 10% BLS | 10% Adult Trauma |
| 10% Adult Arrest | 15% Pediatrics |

Certification & CME Information

- *Of the 36 hours of Physician Directed Call Review CME required for REMAC Refresher recertification, at least 18 hours must be ACR/PCR Review (which may include QA/QI Review). The remaining 18 hours may include ED Teaching Rounds and OLMC Rotation.*
- **Failure to maintain a valid NYS EMT-P card will invalidate your REMAC certification.**
- **By the day of their refresher exam all candidates must present a letter from their Medical Director verifying fulfillment of CME requirements. Failure to do so will prevent recertification.**
- **FDNY paramedics, see your ALS coordinator or Division Medical Director for CME letters.**
- **CME letters must indicate the proper number of hours, per REMAC Advisory # 2000-03:**
 - 36 hours - Physician Directed Call Review
 - ACR Review, QA/I Session (**minimum 18 hours of ACR/QA review**)
 - Emergency Department Teaching Rounds, OLMC Rotation
 - 36 hours - Alternative Source CME - **Maximum of 12 hours per venue**
 - Online CME
 - Lectures / Symposiums / Conferences
 - Journal CME
 - Clinical rotations
 - Associated Certifications:
BCLS / ACLS / PALS / NALS / PHTLS

REMAC Refresher Written examinations are held monthly, and may be attended up to 6 months before your expiration date. See the exam calendar at the end of this Journal. To register, call the Registration Hotline @ 718-999-7074 by the last day of the month prior to your exam.

REMAC Quarterly Written and Oral examinations are held every January, April, July & October. Registration is limited to the first 50 applicants. See the exam calendar at the end of this journal.

REMAC CME and Protocol information is available, and suggestions or questions about the newsletter are welcome. Call 718-999-2671 or email swansoc@fdny.nyc.gov

REMSCO: www.NYCREMSCO.org
NYS/DOH: www.Health.State.NY.US

Online CME: www.EMS-CE.com www.MedicEd.com
www.EMCert.com www.WebCME.com
www.EMINET.com

FDNY ALS Division Coordinators

- | | |
|--|---|
| <ul style="list-style-type: none">• <u>Citywide ALS</u> <u>718-999-1738</u>
Lt. Joseph Pataky• <u>Division 1</u> <u>212-964-4518</u>
Andrea Katsanakos• <u>Division 2</u> <u>718-829-6069</u>
John Langley• <u>Division 3</u> <u>718-968-9750</u>
Gary Simmonds | <ul style="list-style-type: none">• <u>Division 4</u> <u>718-281-3392</u>
Mike Romps• <u>Division 5</u> <u>718-979-7175</u>
Joseph D'Agosto• <u>Bureau of Training</u> <u>718-281-8325</u>
Hector Arroyo• <u>EMS Pharmacy</u> <u>718-571-7620</u>
Cindy Corcoran |
|--|---|
-

FDNY EMS -Division Medical Directors

- | | |
|--|--|
| <ul style="list-style-type: none">• <u>Dr. Dario Gonzalez</u> <u>718-281-8473</u>
Field Response Divisions 1 & 2
USAR/FEMA/OEM/HAZMAT Director
• <u>Dr. Glenn Asaeda</u> <u>718-999-2666</u>
Field Response Divisions 3, 4 & 5
USAR/ FEMA/OEM/HAZMAT Assoc. Director
REMSCO/REMAC Coordinator
• <u>Dr. Bradley Kaufman</u> <u>718-999-1872</u>
System-wide Quality Assurance Director
Medical Director of Emergency Dispatch
and Pre-Arrestment Screening Unit | <ul style="list-style-type: none">• <u>Dr. John Freese</u> <u>718-281-3861</u>
On-line Medical Control Director
Director of Prehospital Research
• <u>Dr. Doug Isaacs</u> <u>718-281-8428</u>
Medical Director of EMS Training
EMS Fellows• <u>Dr. Angus Jameson</u> <u>718-999-0351</u>• <u>Dr. Jessica Van Voorhees</u> <u>718-999-0364</u> |
|--|--|
-

FDNY OLMC Physicians and ID Numbers

Acosta, Juan 80286	Huie, Frederick 80300
Alexandrou, Nikolaos 80282	Isaacs, Doug 80299
Asaeda, Glenn 80276	Jacobowitz, Susan 80297
Barbara, Paul 80306	Kaufman, Bradley 80289
Ben-Eli, David 80298	Lombardi, Gary 80225
Cordi, Heidi 80279	McIntosh, Barbara 80246
Cox, Lincoln 80305	Munjal, Kevin 80308
Freese, John 80293	Pascual, Jay 80287
Giordano, Lorraine 80243	Safford, Mark 80307
Gonzalez, Dario 80256	Schenker, Josef 80296
Hansard, Paul 80226	Schoenwetter, David 80304
Hegde, Hradaya 80262	Schneitzer, Leila 80241
Hew, Phillip 80267	Silverman, Lewis 80249
	Soloff, Lewis 80302

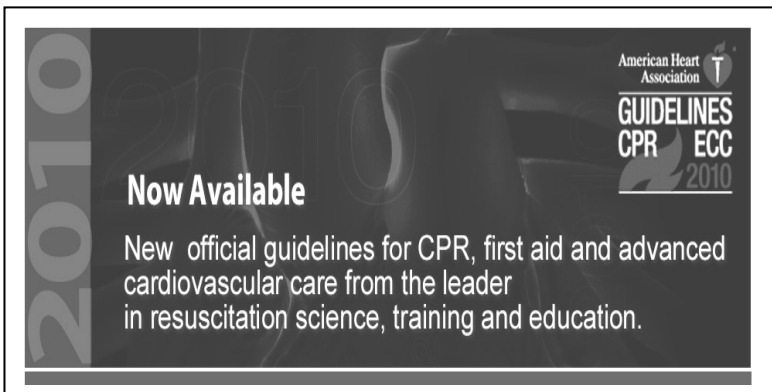
GUIDELINES – 2010: LET’S NOT WAIT

INTRODUCTION

In 2005, the American Heart Association released what were at the time its latest Guidelines for CPR and Emergency Cardiovascular Care (ECC). And those Guidelines contained significant changes with respect to the way that we should all approach the management of an out-of-hospital cardiac arrest.

But those Guidelines were released very late in 2005 – late enough that they could not be incorporated prior to the release of the 2006 REMAC Protocols. And so it was not until 2007 that the majority of the changes recommended in the 2005 Guidelines had an impact on patient care in the New York City system. And had we known then how significant the impact might have been for patients, perhaps we would have found a way to introduce those changes earlier. After all, it appears that survival following out-of-hospital cardiac arrest in New York City has almost doubled as a result of those changes.

So this time around, where possible, we will not be so slow to change.



On October 18th, the American Heart Association released the 2010 Guidelines for CPR and ECC. These Guidelines will undoubtedly result in changes to our REMAC Protocols when they are released next year, and the members of the REMAC’s Protocol Committee are already working hard on this task – ensuring that the changes that are made are appropriate for our system and our patients.

And yet there are a lot of important areas of the 2010 Guidelines that do not require a protocol change.

They are not issues of which drug to use, new devices that may improve outcomes, or other recommendations that require a protocol change prior to implementation. Instead many of the 2010 changes focus on the mechanics of what it means to “Begin Basic Cardiac Life Support procedures” and other things that you should consider during the course of your resuscitation efforts. For these changes, we do not need a protocol change, and our patients do not need to wait.

So this month’s article will focus on those aspects of the 2010 Guidelines that you should change now – as soon as you finish reading this article. Don’t wait. Don’t deprive your patients of the most up-to-date care that you can provide to them. This article serves as your authorization to change the areas of practice that will be discussed in the coming pages, and that is not in conflict with any existing document or protocol. And next month, once everyone has had a chance to read this article, OMA will be working with EMS Operations to ensure that our new standard of care for the Department, including the care that we expect EMS Officers to oversee and ensure, includes these changes.

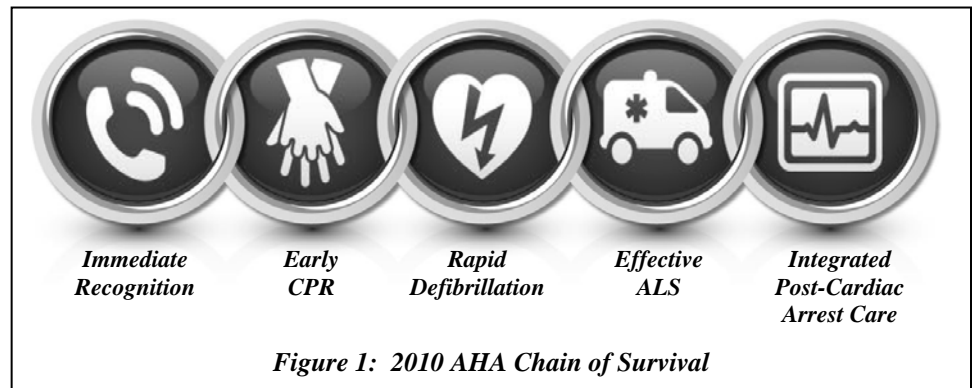
OVERVIEW

It doesn’t honestly matter whether you chose to read through the 300-plus pages of the 2010 AHA Guidelines for CPR and ECC, the more “slim” 233 pages of the European Resuscitation Council’s version of the same changes, or the 330 pages of the International Liaison Committee on Resuscitation summary document – though it is worth your time to read through at least one of them – all of them have one thing in common that you will notice very quickly. The vast majority of the “changes” in these documents are not changes at all for our system. In fact, fortunately for your patients, they represent

in many cases the care that you have already been providing. And in some cases those “changes” were made in this system prior to even the 2005 Guidelines.

Whether it is compressions-only pre-arrival instructions to be given by our dispatchers, the focus on the basics of CPR, the efforts to eliminate unnecessary ventilation, or the identification of “gaspings” as a sign of an impending or early cardiac arrest state, our system and each of you should be proud that the care that you have been providing for the past several years should be considered “ahead of the game.”

That said, the importance of these areas requires that we take the time to consider each aspect of our resuscitation efforts and the new concepts or support for our current standards of care in the New York City 911 system that is contained in these new Guidelines. So this article will do just that – focusing



on each of the links in the “new” Chain of Survival – Immediate Recognition, Early CPR, Rapid Defibrillation, Effective Advanced Life Support, and Integrated Post-Cardiac Arrest Care. Finally, we will look at special resuscitation situations for which the “usual approach” to a cardiac arrest may need to be altered.

So, without further ado, we present a summary of the 2010 American Heart Association Guidelines for CPR and ECC and provide recommendations from within these guidelines that you should begin to use today, as well as reinforcing those “new” recommendations that you are already using....

IMMEDIATE RECOGNITION

The first key to maximizing out-of-hospital cardiac arrest survival is identifying the patient as being in arrest or impending arrest. This allows the system to allocate the necessary resources and to ensure that the call is given appropriate priority – both of which help to minimize response time and provide the necessary medical professionals for the resuscitation – not to mention allowing those professionals (you) to enter the job already in that mindset of initiating resuscitation rather than having the potential to be caught with your mental, physical, and/or emotional guard down, thinking that the job/patient’s condition is something “less intense.”

The new Guidelines recognize that patients may continue to have some respiratory effort even after the onset of cardiac arrest, that waiting for the absence of respirations may unnecessarily delay resuscitation, and that CPR is not likely to be harmful even if provided to someone mistakenly thought to be in cardiac arrest. And at the same time, we know that delaying the initiation of CPR – even for a few seconds – when someone is in cardiac arrest can significantly harm their chances for survival.

So the new Guidelines recommend that EMS activation for a cardiac arrest and initiation of CPR should be done if a patient is “unresponsive and not breathing or not breathing normally (i.e. only gasping).” And for this reason, “look, listen, and feel” is no longer necessary or recommended.

This means that you may be sent on an ARREST call for patient who ends up not being in cardiac arrest, but the description of their lack of breathing or “gaspings” respirations were concerning enough that the ARREST call-type was

appropriate because the goal is to try to capture as many actual arrests as possible (and as early as possible) in order to get those patients the timely care that they need.

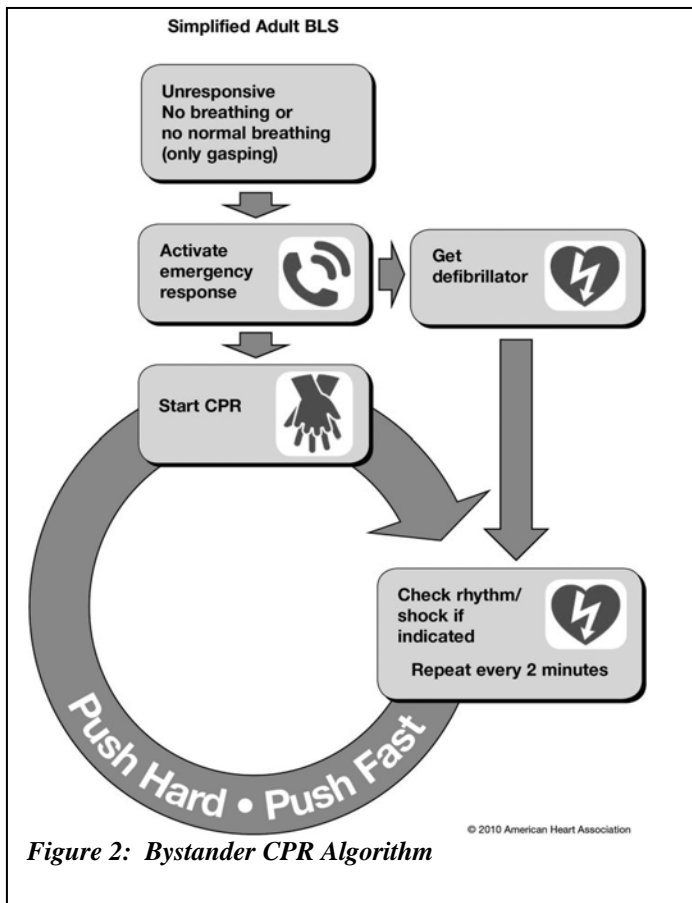


Figure 2: Bystander CPR Algorithm

Although this is a “new” recommendation, FDNY EMS Communications has actually included this approach in their universal question set and criteria for an ARREST call-type for nearly a decade. For years, you have been dispatched to ARREST calls because the patient was unconscious and gasping for air, barely breathing, turning blue, etc, and the New York City 911 system will continue this practice.

The Guidelines also discuss the fact that many patients experience seizure activity at the onset of the arrest. And while they did not recommend that seizure activity also lead to cardiac arrest responses and the initiation of CPR, the Office of Medical Affairs, EMS Communications, and EMS Operations continue to look at this issue to see if there are ways in which we can further improve the ability of our system to identify cardiac arrests early and accurately.

EARLY CPR

Bystander CPR

In an ideal world, for every arrest except those witnessed by you (the EMS provider), the word “early” would imply that CPR was initiated prior to your arrival. And while New York City has seen a slow and steady increase in bystander CPR over the past 20 years, the majority of patients still do not receive the benefits of CPR during those few minutes between the 911 call and your arrival. This problem, which is not unique to New York City, was recognized by the AHA and, in an effort to increase the number of patients who receive bystander CPR and the speed with which compressions are initiated, the new Guidelines include a very impressive shift with respect to the emphasis for pre-arrival instructions / bystander CPR.

Every one of us, at the time of our first CPR class, learned about the A-B-Cs and that we start by opening the airway. But that is no longer true. Today’s recommendations are that bystander CPR is taught and delivered as the C-A-Bs. That’s right – compressions are now first.

This change took into account the data showing that some bystanders are reluctant to provide CPR because of a fear of the airway issues (particularly mouth-to-mouth breathing), but more important than that was the data showing that untrained bystanders took minutes to deliver the first compression when they had to be taught over the phone how to open the airway, look / listen / feel for breathing, deliver rescue breaths, etc. So for adult cardiac arrest, the emphasis is now on compressions first. There are still circumstances when airway and breathing should come first (pediatrics, drownings), but the majority of adult patients will benefit significantly from this C-A-B approach.

In addition, CPR with only chest compressions (Hands-Only CPR) seems to be as effective as standard CPR when provided during the period prior to EMS arrival, may be more accepted due to the potential fear among the public with regard to mouth-to-mouth, and may even provide an effective form of ventilation for the first few minutes of the arrest. FDNY EMS Communications has also been doing this for the better part of a decade, initiating the change to compressions-only CPR in their pre-arrival instructions in 2004.

Professional CPR

The 2010 Guidelines recognize the importance of CPR, and in particular chest compressions, as a “fundamental aspect of cardiac arrest resuscitation.” The 2005 Guidelines, as you know, included dramatic changes with respect to the fundamentals of CPR, and those changes are reinforced in the latest edition of the Guidelines.

While the recognition of a potential arrest should be triggered no differently for healthcare providers or bystanders (unconscious + absent or abnormal breathing = start CPR), unlike bystanders it is still acceptable for healthcare providers to check for a pulse prior to the initiation (or continuation) of CPR. But it is also recognized that even trained healthcare providers have difficulty determining the presence or absence of a pulse at times. So the recommendation is that you check for a pulse for no more than ten (10) seconds and, if you have not definitely felt a pulse during that time, immediately initiate CPR.

Our system has spent a lot of time and effort (not to mention a lot of prior CME articles) addressing the fundamentals of CPR and the rationale for each part of that emphasis. And because we have discussed in those prior training sessions / CME articles the physiology of CPR and the various components of effective chest compressions, we will not take the time to revisit all of that material now. But it is important to recognize the renewed emphasis that the 2010 Guidelines place on quality CPR and to review the resulting changes in the Guidelines.

Table 1 shows the CPR recommendations for adults, children, and infants. As you can see, most of these key components are things that you have already been doing. And those areas that have changed since 2005, underlined and noted in bold, are intended to emphasize the importance of quality compressions as the foundation for a successful resuscitation effort.

Table 1: 2010 Guidelines for CPR by EMS Professionals

	Adults	Children	Infants
CPR Sequence	<u>C-A-B</u> (initiate compressions, open the airway and ventilate <u>after</u> first cycle of compressions)		
Compression Rate	<u>At least</u> 100 per minute		
Compression Depth	<u>At least</u> two (2) inches	<u>At least</u> 1/3 of chest depth or about two (2) inches	<u>At least</u> 1/3 of chest depth or about one and a half (1.5) inches
Chest Wall Recoil	Allow complete chest wall recoil between each compression, rotate providers every two minutes		
Compression Interruptions	Minimize interruptions; when necessary, limit interruptions to less than 10 seconds		
Airway	Open <u>after first round of compressions</u> using head tilt-chin lift (jaw thrust in trauma)		
Compression to Ventilation Ratio (no advanced airway)	30:2	15:2	15:2
Ventilations with Advanced Airway	One breath every 6-8 seconds (8-10 breaths per minute), asynchronous with compressions		

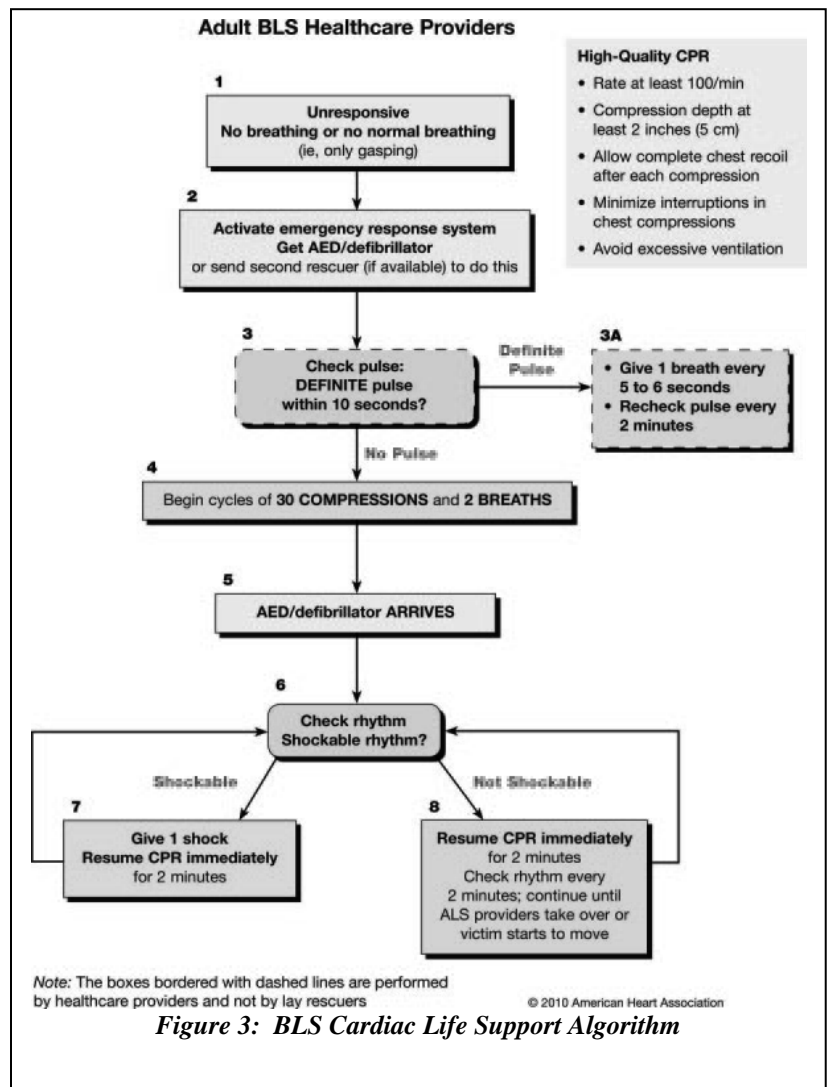
What you can see from *Table 1* is that compressions remain the focus of CPR and are even more emphasized than before. The target rate for compressions in all ages is no longer 100, it is **at least** 100 (with an upper limit of 120). And the recommended depth of compressions is no longer two inches in adults and 1/3 of the chest depth for children and infants, but it is now **at least** this deep. And, as with bystanders, compressions are recommended prior to the initial opening of the airway and breathing, even for healthcare providers. For adults, this is summarized in the AHA's Adult BLS Healthcare Providers algorithm (Figure 2).

Ventilation, as we have discussed before, should be limited via bag-valve-mask, with or without an advanced airway in place, to no more than 10 breaths per minute. If no advanced airway is in place, ventilations should be delivered over one (1) second, should result in chest rise, and should be delivered twice following every 30 compressions (ensuring that compressions are immediately resumed after the second ventilation). If an advanced airway is in place, ventilations should be delivered no more than once every six to eight seconds and in an asynchronous fashion.

One final note on CPR relates to the use of cricoid pressure. While this may be useful as an aid to intubation by improving visualization of the vocal cords (though we prefer the use of the B-U-R-P maneuver discussed in previous articles), the 2010 Guidelines recognize that the literature suggests that aspiration can occur despite the use of this technique, that it may actually delay or complicate placement of an advanced airway, and that it can actually be harmful. For that reason, the use of this technique is no longer recommended.

RAPID DEFIBRILLATION

The AHA Guidelines state that shockable rhythms (ventricular fibrillation) are the most common presenting rhythm among witnessed arrests. While this is not true in New York City, what is true is that these are the cardiac arrest patients who have the best chance of survival with proper treatment – treatment that includes rapid use of a defibrillator.



Immediate or Delayed Defibrillation

In 2005, there was a lot of debate about whether to provide CPR prior to initial rhythm analysis and defibrillation. And based upon the available science at the time, the AHA decided that “EMS system medical directors may consider implementing a protocol that would allow EMS responders to provide about 5 cycles (about 2 minutes) of CPR before defibrillation of patients found by EMS personnel to be in VF, particularly when the EMS system call-to-response interval is 4 to 5 minutes.” And that is exactly what we decided to do in New York City, with the exception of the FDNY’s EMTs and CFRs who (for the SmartCPR Trial) immediately applied the AED and followed its direction.

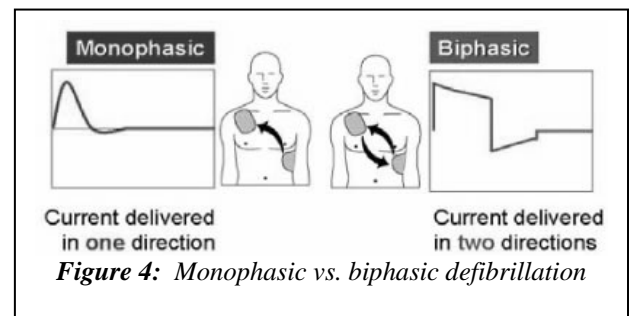
In 2010, the AHA recognized that some additional studies had found that the delivery of CPR prior to defibrillation did not improve or worsen survival, and they made recommendations regarding this practice that the REMAC will consider for our 2011 Protocols. But at this time, nothing has changed. ALS providers and non-FDNY BLS providers should continue to provide CPR prior to initial rhythm analysis and defibrillation, unless the arrest is witnessed by EMS providers. And FDNY providers using an FDNY AED should immediately apply the AED and follow its recommendations for all arrests.

One Shock or Three Shocks

Another significant change in 2005 was the elimination of stacked shocks. This change was made in order to minimize the interruption in CPR that occurs during defibrillation, and this change has been reaffirmed in the 2010 Guidelines. Given the significant interruptions in compressions that would be necessary to deliver stacked shocks and the high success rate of the defibrillators in use today (>90% terminate VF with a single shock), the harm that would be done with stacked shocks outweighs any potential benefit. And so your practice of delivering a shock and immediately resuming CPR for another two-minute cycle should continue.

Biphasic Defibrillation Settings

Older defibrillators provide what is termed a monophasic shock – the energy travels in one direction through the thorax. But more modern defibrillators (ALS monitors and AEDs) utilize energy that travels in one direction for a portion of the shock and then reverses itself and travels in the opposite direction for the remainder for the shock, termed a biphasic defibrillation. And while the advantage of this type of shock is that it causes less damage to the heart and may



allow for successful defibrillation at lower energy settings, the ideal exact energy settings for these devices have not been established. The 2010 Guidelines recognized this and allowed for “defibrillation at the maximum dose” using these devices, consistent with our current protocols. And so you should continue to defibrillate patients using an AED at its preset energy level or an ALS defibrillator at the maximum possible energy setting.

Electrode Placement

Though most of us have used the “sternum-apex” position for defibrillation pads for most of our careers, even in the “old days” when we used manual defibrillator paddles, there are other accepted pad positions. The AHA considered the use of the anterior-lateral (“sternum-apex”), anterior-posterior, anterior-left infrascapular, and anterior-right infrascapular

positions. They recognized that each of these four positions is equally effective for defibrillation and/or cardioversion, but for ease of pad placement (least interruption of chest compressions) they recommend the continued use of the “sternum-apex” position that we are all accustomed to using.

The two exceptions to this recommendation are when the patient has an implanted defibrillator / pacemaker or when using a defibrillator pads in infants. We will discuss the issue of pediatric AED use and pad placement below, but let’s take a moment to consider the issue of implanted devices (defibrillators, pacemakers).

If the patient has an implanted defibrillator that is actively shocking the patient (as evidenced by muscle twitching of the chest wall), allow 30-60 seconds for the internal defibrillator to complete its treatment cycle before applying an AED / ALS defibrillator. Then, apply the external defibrillator pads so that they do not overlay and are ideally at least 8cm (3 inches) away from the implanted device. That said, application of the external defibrillator pads should not delay your treatment. If necessary, applying the pads directly over such a device is acceptable in order to deliver effective prehospital care. Said another way, if the pads are applied and then the implanted device is noted, continue with your resuscitation efforts – do not stop simply to reposition the pads.

AED use in children

Fortunately, cardiac arrest is not as common in children as in adults. And for those of you who have been involved in a pediatric resuscitation, you know how stressful it can be. But the stress of the moment or the rush to get the child to the hospital must not prevent us from providing the best possible care to these children while they are in the prehospital setting.

The 2010 Guidelines note that shockable rhythms (ventricular fibrillation) occur in 5-15% of pediatric arrests, and this is consistent with what we have seen here in New York City. Among the AED uses by FDNY personnel for patients age < 18 years, just over 15% of those patients presented in shockable rhythms. This is important to know for two reasons. First, when shockable rhythms are found, 100% of them were successfully converted with the first defibrillation attempt. This is critical to the patient’s chances of survival because, given the way VF deteriorates, these children were likely to have progressed to asystole had the on-scene crews not promptly treated them with the AED. The second reason that this is important to know is that a significant number of pediatric arrests each year miss this opportunity for treatment.

We all know that ventricular fibrillation deteriorates over time. This is why, in adults, there is a 7-10% decrease in the likelihood of survival for every minute that treatment with a defibrillator is delayed. But in children the deterioration of ventricular fibrillation may be more rapid because of the size of their heart – its smaller size causing the ventricular fibrillation to progress to asystole (“flat line”) more quickly than in adults. So that if children are not afforded the potential life-saving treatment of an AED or ALS monitor, we may miss the opportunity to save their life. So, every child in cardiac arrest must have an AED or ALS monitor applied prior to transport. And if they present in a shockable rhythm, defibrillation must occur promptly.

And so this begs the question of the use of AEDs in children. And, once again, the 2010 Guidelines support our current practice. “...the rescuer should use a standard AED” for children age 1-8 if an AED with pediatric-specific pads is not

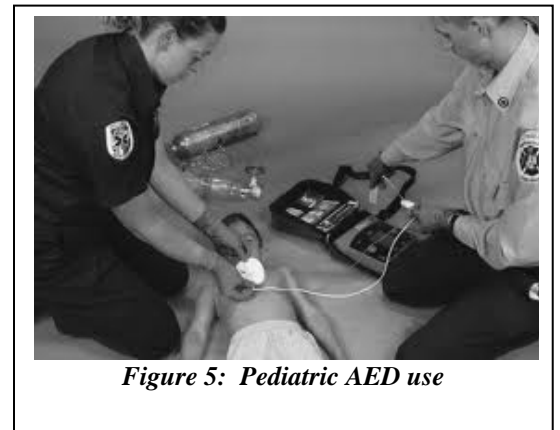


Figure 5: Pediatric AED use

available. And even for infants, the same applies: if a manual defibrillator or AED with pediatric-specific pads is not available, a standard AED may be used. But in infants, it is important to remember that the AED pads will need to be placed in an anterior-posterior position to ensure that the pads do not overlap.

Fibrillation Waveform Analysis

To quote the 2010 Guidelines, the “value of VF waveform analysis to guide defibrillation management is uncertain.” Addressing this uncertainty was one of the goals of the SmartCPR Trial that the Department has been involved with for the past three years. And while the analysis of the data from this trial is on-going, it is likely that the Trial will not provide the “definitive” answer to this question. Like so many trials, the results appear to lead to more questions than answers. But while the analysis continues, it is clear that VF waveform analysis holds promise for improving cardiac arrest survival in this City and around the world.

In the coming months, we will be announcing the results of the SmartCPR Trial. But our initial look at the data suggests that we should not change course. This is why, for now, the FDNY’s BLS and CFR providers will continue to apply their AEDs and to follow its direction, allowing it to decide on the best treatment course of each individual patient.

Mechanical Defibrillation

One could think of the precordial thump as a form a mechanical defibrillation – a sudden application of force to the anterior chest designed to “jolt” the heart out of ventricular fibrillation. And while this intervention was long thought to be effective, there is no data to date which supports its routine use. So the 2010 Guidelines recommend that, unless there is an episode of witnessed pulseless ventricular tachycardia for which a defibrillator is not available, the precordial thump not be used. And since one would not know that the rhythm was ventricular tachycardia unless an ALS monitor / AED was already attached, there appears to be no reason to use this intervention in the New York City region.

Edison Medicine – One Final Note

Although it is not defibrillation, this seems an appropriate place to put a comment about the use of another electrical therapy for the treatment of non-shockable rhythms (PEA, asystole). We are of course talking about the use by ALS providers of transthoracic pacing.

The 2010 Guidelines start off with a very blunt statement about pacing. “Pacing is not recommended for patients in asystolic cardiac arrest.” This statement is supported by a number of studies that have found that attempts to pace patients with asystolic arrests unnecessarily interrupted CPR and did not result in any survival improvement, short-term or long-term. For this reason not only is it not recommended, but it is given a recommendation status that suggests that it is likely to be harmful.

As for patients with PEA arrests, there is no particular recommendation found in the 2010 Guidelines, but it does suggest that the only patient population for whom pacing may be of benefit are those patients with symptomatic bradycardia (i.e. they have a pulse) when the patient does not respond to atropine or second-line medications.

In short, pacing should not be considered as part of the management for out-of-hospital cardiac arrests.

EFFECTIVE ADVANCED LIFE SUPPORT

There have been a number of studies addressing the role of ALS in the management of the out-of-hospital cardiac arrest that have led to an interesting set of interpretations in 2010. When the International Liaison Committee on Resuscitation (ILCOR) released their Consensus on Science with Treatment Recommendations (CoSTR) document that may be considered the foundation upon which the American (AHA) and European (ERC) Guidelines are based, there was no particular statement about the role of ALS in the management of cardiac arrest. Instead, they spent thirty-one pages reviewing the science behind many of the things that we all consider to be “ALS.” Yet the interpretation of this science in the United States and Europe resulted in two very different conclusions.

In the United States, the American Heart Association changed its Chain of Survival and modified the link previously listed as “Early ACLS” to “Effective Advanced Life Support.” But the European Resuscitation Council apparently interpreted the science a different way, changing their Chain of Survival in a way that eliminated ALS from the Chain.

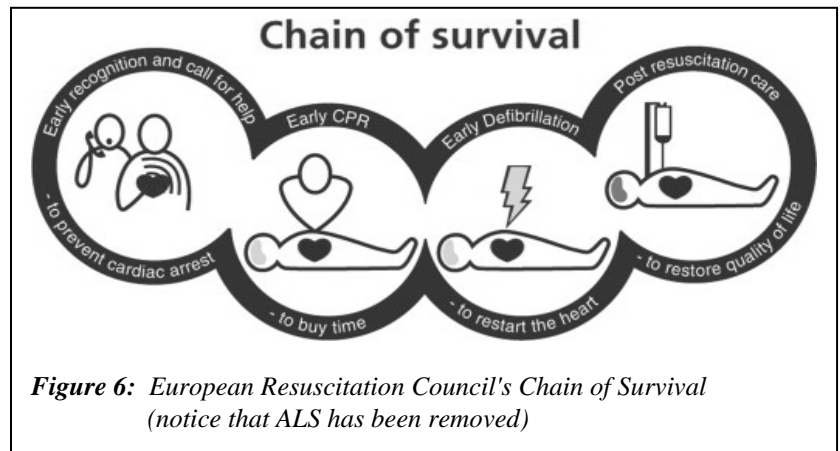


Figure 6: European Resuscitation Council's Chain of Survival (notice that ALS has been removed)

In New York, we continue to believe in the value of ALS for the management of out-of-hospital cardiac arrest. While it is true that the majority of survivors come from the subset of arrests that present in ventricular fibrillation and are amenable to rapid defibrillation (meaning that BLS is the difference between survival and death and the value of ALS is statistically hard to prove), there are patient populations who would not survive without ALS intervention. In particular, this includes those patients with a non-shockable (non-VF) arrest with an identifiable, reversible cause for their arrest. Without ALS intervention, the cause of the arrest in these patients could not be treated. And now with prehospital hypothermia, that potential benefit may be even more dramatic.

So, in agreement with the AHA, this section is meant to reinforce the use of “effective ALS.” Basic life support care serves as the foundation for saving the lives of out-of-hospital cardiac arrest patients. But when the rapid and effective delivery of BLS care fails to restore circulation, it is the effective integration of ALS care into on-going BLS care that may mean the difference between life and death.

Impedance Threshold Device

In 2005, the AHA Guidelines gave a Class IIa recommendation to the impedance threshold device (i.e. ResQPOD), suggesting that “the weight of the available evidence supports” its use. And at the time, it was the only device / CPR adjunct to receive such a recommendation.

In January 2010, the FDNY implemented the ResQPOD as part of its most recent efforts to improve out-of-hospital cardiac arrest survival. Yet after three months of use it became clear that the introduction of the device (though perhaps not the device itself) had resulted in a significant reduction in immediate survival (i.e. return of spontaneous circulation), and the device was removed from use.

This past month, in the release of the 2010 Guidelines, impedance threshold devices such as the ResQPOD were downgraded to a Class IIb recommendation – “usefulness / effectiveness is unknown or unclear or not well established.” In fact, while the Guidelines address a variety of devices such as active compression-decompression CPR, mechanical piston CPR devices, vest / load-distributing band CPR devices, and other CPR adjuncts, the summary of this section of the Guidelines concludes with the following statement: “To date, no adjunct has consistently been shown to be superior to standard conventional (manual) CPR

for out-of-hospital basic life support, and no device other than a defibrillator has consistently improved long-term survival from out-of-hospital cardiac arrest.”

Although the FDNY continues its analysis of this device and its impact on cardiac arrest outcomes, the early experience with this device and the most recent AHA classification of this device question its role in routine resuscitation efforts and, for these reasons, is not expected to be reintroduced in the New York City region.

Advanced Airway Management

The 2010 Guidelines begin with a very equivalent statement with regard to the use of advanced airway management of cardiac arrest – “Ventilation with a bag and mask or with a bag through an advanced airway (e.g. endotracheal tube or supraglottic airway) is acceptable during CPR.” But particularly when ventilation via a bag-valve-mask (BVM) is inadequate, introduction of advanced airway management is an important part of on-going resuscitation efforts.

Endotracheal intubation is a controversial issue with respect to the attempted resuscitation of out-of-hospital cardiac arrest. Studies to date have yet to identify the role of endotracheal intubation with respect to increasing cardiac arrest survival. And this includes the results of the SmartCPR Trial in which patients with a presenting rhythm of ventricular fibrillation were found to have worse or at best equivalent outcomes (during prolonged resuscitation) when endotracheal intubation was performed as compared to when only BVM ventilation or other advanced airway devices were used. This is likely because of the interruption of CPR that often occurs during endotracheal intubation. If this interruption is minimized, and BVM ventilation or use of an alternative airway is inadequate, endotracheal intubation continues to play a role in the management of the cardiac arrest patient.



Figure 7: ALS Airways

And when endotracheal intubation is performed, one thing that the 2010 Guidelines reinforced was (once again) something that you have already been doing for at least two year – the use of waveform capnography.

Capnography

Receiving the highest possible recommendation in the 2010 Guidelines, Class I / Level of Evidence A, waveform capnography was recommended for the use of confirmation and maintenance of endotracheal tube placement, even during cardiac arrest. And while the 2010 Guidelines recognized that the use of waveform capnography has not been studied in use with other airways (i.e. supraglottic airways such as the Combitube or King LT airways), they also stated that “effective

ventilation through a supraglottic airway should result in a capnography waveform during CPR and after ROSC” and may therefore be useful.

This recommendation is consistent with our current practice of using this technology with any “advanced airway device”, whether the patient has a pulse or not.

And the 2010 Guidelines go a step further, supporting the use of such monitoring in patients irrespective of the patient’s age. Finally, the use of waveform capnography is recommended in the 2010 Guidelines for adults, in pediatrics, and even in neonatal resuscitation.

Endotracheal Intubation versus “Alternative” Airways

This section is best summarized by simply quoting the 2010 AHA Guidelines...

“Unlike endotracheal intubation, intubation with a supraglottic airway does not require visualization of the glottis, so both initial training and maintenance of skills are easier. Also, because direct visualization is not necessary, a supraglottic airway is inserted without interrupting compressions.... When prehospital providers are trained in the use of advanced supraglottic airways... they appear to be able to use these devices safely and can provide ventilation that is as effective as that provided with a bag and mask or an endotracheal tube.”

This is not meant to suggest that endotracheal intubation is unnecessary or inappropriate. But what must be realized is that any skill including endotracheal intubation that results in a prolonged / unnecessary interruption of chest compressions (i.e. more than 10 seconds) is likely to be more harmful to patients than beneficial. Perhaps this is why the 2010 Guidelines begin their discussion of endotracheal intubation by saying that it “was once considered the optimal method of managing the airway during cardiac arrest. However, intubation attempts by unskilled providers can produce complications, such as trauma to the oropharynx, interruption of compressions and ventilations for unacceptably long periods, and hypoxemia from prolonged intubation attempts or failure to recognize tube misplacement or displacement...”

There is no suggestion in the 2010 Guidelines that endotracheal intubation is inappropriate. But the use of this skill, as per the Guidelines, should be limited to the following circumstances: 1) the skill is attempted by a skilled, experienced provider in a system with ongoing quality assurance, 2) waveform capnography must be used for assessment of initial tube placement and ongoing monitoring of tube placement, 3) ventilation is unable to be performed via bag-valve-mask, 4) protective airway reflexes such as gagging are absent, and 5) performing endotracheal intubation can be accomplished in two attempts or less with a total interruption of compressions that is not in excess of 10 seconds.

Focus on Reversible Causes

As you can see, the 2010 ACLS Cardiac Arrest Circular Algorithm is focused on the essentials of resuscitation (chest compressions and CPR quality) with a lesser but important secondary focus on the reversible causes of the patient’s arrest. These reversible causes and their treatment, nearly all of which are allowable under REMAC Protocols, must be considered and treated early to optimize the patient’s chances of survival”

- *Hypovolemia*: treatment is intravenous fluid (now accomplished for all nontraumatic arrests during induction of prehospital hypothermia)

- ❑ *Hypoxia*: treatment already addressed in the initial minute of resuscitation via effective ventilation and oxygenation of the patient
- ❑ *Hydrogen ion (acidosis)*: though initially treated via appropriate ventilation (which will correct a respiratory acidosis or help to compensate for a metabolic acidosis), the administration of sodium bicarbonate may be necessary as a medical control option
- ❑ *Hypo- / Hyperkalemia*: while we cannot treat hypokalemia in the prehospital setting, the more common condition (hyperkalemia) is readily treated using calcium chloride, sodium bicarbonate, and albuterol as a combination of medical control options and medical control discretionary orders
- ❑ *Hypothermia*: moderate to severe hypothermia is treated with active rewarming and on-going resuscitation, remembering that a patient is “not dead until they’re warm and dead” (Note: Hypothermia refers to moderate or severe hypothermia, not the mild hypothermia that we attempt to induce with ice-cold saline infusion)
- ❑ *Tension pneumothorax*: needle decompression can rapidly and effectively provide the temporary treatment necessary to maintain a patient’s life until they arrive at a 911 receiving facility
- ❑ *Tamponade, cardiac* – although pericardiocentesis is not presently listed as a prehospital intervention in the New York City region, rapid recognition of this condition and transport to a 911 receiving facility (with notification) may allow for the appropriate in-hospital care
- ❑ *Toxins / overdose*: although there are a number of toxins to consider, most of which do not have a readily available antidote, there are a handful of overdoses that should be considered for prehospital intervention:
 - *Beta-blocker overdose*: remember that you can bypass the overdose in these cases by going around the beta receptor and stimulating the same pathway using glucagon – the initial dose is 3-5mg intravenously and requires medical control contact for a discretionary order
 - *Calcium channel blocker overdose*: the administration of intravenous calcium chloride, as a medical control option, may reverse this otherwise lethal overdose
 - *Tricyclic antidepressant (TCA) overdose*: often presenting in polymorphic ventricular tachycardia (Torsades), this overdose may be successfully managed with multiple doses of sodium bicarbonate as a medical control option
 - *Narcotic overdoses*: although one might think that the provision of CPR has already treated these arrests given their primary respiratory nature, there may be a component of vascular tone / systemic vascular resistance that still requires the administration of naloxone (even in large doses)
 - *Carbon monoxide (CO)*: while high-concentration oxygen is the mainstay of therapy for these patients, the delivery of hyperbaric oxygen (HBO) is indicated for patients whose arrest is the result of CO exposure and reinforces the need for CO assessment (RAD-57) and selective transport to HBO centers as directed under Department guidelines
 - *Cyanide*: patients who are exposed to direct cyanide products (lab workers, jewelers, etc) and those indirectly exposed to cyanide (smoke inhalation / fire victims) may be successfully treated with hydroxocobalamin and/or sodium thiosulfate as per REMAC protocols



Figure 8: Overdose

- ❑ *Thrombosis (pulmonary)*: like cardiac tamponade, though the treatment of this cause is not presently listed as a prehospital intervention in the New York City region, rapid recognition of this condition and transport to a 911 receiving facility (with notification) may allow for the appropriate in-hospital care
- ❑ *Thrombosis (cardiac)*: this cause represents the reason why a post-ROSC 12-lead is so important – if the arrest was caused by a STEMI that we can identify after ROSC, then survival may be dependent upon our selective transport of these patients to PCI / STEMI centers

In short, considering reversible causes for the patient’s arrest while ensuring the continuation of the BLS resuscitation care is one of the primary responsibilities of the ALS providers in the New York City system, including the OLMC physicians. Early identification of these causes has resulted in dozens of out-of-hospital cardiac arrest survivors in recent years and represents the primary impact that ALS providers will have for this population.

ALS Drug Therapy

Because the discussion of ALS medications and the AHA’s 2010 Guidelines recommendations for the use of these medications will require changes to the REMAC Protocols, they are beyond the scope of this article. But the members of the REMAC Protocol committee are already hard at work reviewing these Guidelines, considering their implications for the NYC Region, and developing recommendations for changes to the 2011 REMAC Protocols.

Termination of Resuscitation

There have been a number of termination of resuscitation (TOR) rules that have been put forth in recent years. And while these rules initially appeared to be useful (suggesting the termination of resuscitation in the field for cases that were up to 99.5% likely to not survive), none of these rules was developed in a system that was routinely providing therapeutic hypothermia as part of a standardized approach to post-resuscitation management. And the 2010 Guidelines do a nice job of recognizing this limitation, suggesting that (as is required by NYS DOH regulations) all TOR decisions be made in consultation with on-line medical control.

INTEGRATED POST-CARDIAC ARREST CARE

In both the United States (AHA) and European (ERC) 2010 Guidelines, a fifth link was added to the Chain of Survival to address the need for integrated, standardized post-resuscitation care. This includes the recommendation that EMS systems develop a mechanism to “transport patient to an appropriate hospital with a comprehensive post-cardiac arrest treatment system of care that includes acute coronary interventions, neurologic care, goal-directed critical care, and hypothermia.”

Cardiac Arrest Centers

With the exception of the requirement for acute coronary interventions (i.e. PCI), this concept has been the goal of NYC Project Hypothermia for the past two years. Patients who are successfully resuscitated from out-of-hospital

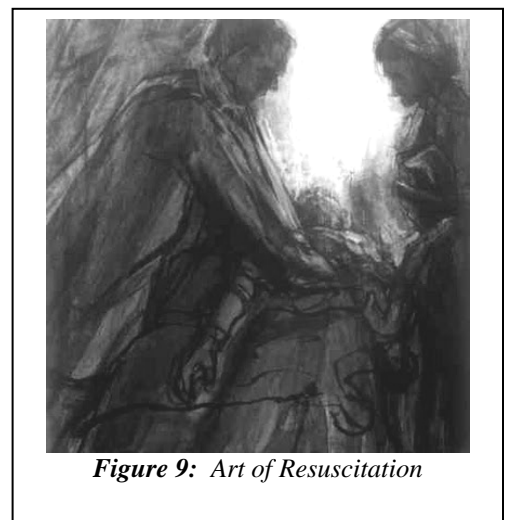


Figure 9: Art of Resuscitation

cardiac arrest or for whom successful resuscitation did not occur despite initiation of therapeutic hypothermia in the prehospital setting should be transported to the nearest Cardiac Arrest Center within the NYC 911 system. As we further evaluate the implications of the 2010 Guidelines and their implications for the New York City 911 system, there may be changes that occur with respect to the number and type of hospitals that qualify as participating facilities in this program.

Vasopressor Support Post-ROSC

One of the areas addressed in the Post-Cardiac Arrest section of the 2010 Guidelines was the use of vasopressor support following ROSC. In particular, the Guidelines recommend that vasoactive drugs such as dopamine “must be titrated at the bedside to secure the intended effect while limiting side effects.” This is the logic that led to the 2010 decision of the REMAC to allow the administration of dopamine under standing orders – a decision that should be made bedside and not miles away by an individual, even a physician, who is not directly and immediately evaluating the needs of the patient.

When Post-Resuscitation Means Post-Termination

It is well-beyond the scope of this article, but one area of discussion in the 2010 Guidelines that has particular relevance for our system is the issue of patients whose resuscitation efforts are terminated in the field. While your resuscitation efforts may not have been able to restore circulation for these patients, that does not mean that no “good” can come from their death.

The 2010 Guidelines recognize what we all know – that not every resuscitation effort can be a success. But it also recognizes that “the functional outcomes of organs transplanted from patients who are brain-dead as a consequence of cardiac arrest when compared with donors who are brain-dead due to other causes” are no different. And therefore “patients who progress to brain death after resuscitation from cardiac arrest should be considered for organ donation....”

Recognition of this possibility and appropriate introduction of the concept of organ donation into the New York City system may allow those patients whose best resuscitation efforts are unable to be revived to still contribute to the survival of another patient who, without your patient’s death, may have otherwise faced death themselves.

RESUSCITATION IN SPECIAL SITUATIONS

The NYC REMAC Protocols, like the 2010 Guidelines, are meant to address the vast majority of cardiac arrest cases and the care that is appropriate for their resuscitation efforts. But that should not suggest that these Protocols / Guidelines are universal. Without question, there are situations in which we need to modify our approach to a resuscitation in order to optimize the patient’s chances of survival.

Asthma

The 2010 Guidelines support the approach to critical asthma management that is included in the current REMAC Protocols, including the use of early corticosteroids, intramuscular epinephrine (via autoinjector or direct administration), the use of beta agonists (particularly albuterol) and the use of anticholinergic agents (i.e. Atrovent or ipratropium). In addition, following advanced airway management, the Guidelines recommend the use of mild hypoventilation (permissive hypercapnia) in order to reduce barotrauma and to facilitate the administration of nebulized medications.

Anaphylaxis

The administration of epinephrine via IM injection or autoinjector is recommended for the treatment of cardiac arrest resulting from anaphylactic reactions. This includes, with medical control contact, the administration of a second dose of epinephrine to patients who do not adequately respond to a first dose.

Drowning

Drowning should not be considered a traumatic arrest, and the poor prognosis that accompanies traumatic arrests should not be attributed to this population. Although the language in the 2010 Guidelines is nearly identical to that found in the 2005 Guidelines, it is important to pay attention to their central message: "...scene resuscitation should be initiated and the victim transported to the ED unless there is obvious death..." And the Guidelines recognized that survivors have occurred in both cold and warm-water situations, meaning that water temperature should not be used as a decision point in deciding whether or not to initiate resuscitation. In addition, the need for ventilation (no compressions-only CPR, either via dispatch instructions or through EMS providers) is emphasized for these arrests and must be ensured.

Hypothermia

In general, the recommendations for the treatment of cardiac arrest resulting from accidental hypothermia have not changed significantly from the 2005 to 2010 Guidelines. In short, "life-saving procedures should be initiated unless the victim is obviously dead... (and the) victim should be transported as soon as possible to a center where aggressive rewarming during resuscitation is possible." Further clarification regarding the treatment of these patients will be brought forth as part of the 2011 REMAC Protocol changes.

Electrical Shock / Lightning Strikes

Particularly with lightning strikes, the 2010 Guidelines recognize the fact that resuscitation "may have high success rates and efforts may be effective even when the interval before resuscitation attempt is prolonged." On a BLS level, AED use and application should proceed as for any other arrest with the addition of cervical spine precautions and the removal of any smoldering clothing / material. And on the ALS side, no modification is needed with respect to standard resuscitation care.

SUMMARY

The incorporation of the 2010 Guidelines into our resuscitations will not be an overnight affair. Many of the changes recommended or supported by the 2010 American Heart Association / European Resuscitation Council / International Liaison Committee on Resuscitation will be debated heavily in the coming months as they pertain to the REMAC Protocols. But some of these changes / recommendations require no protocol changes, and they may be implemented immediately by the prehospital providers in the New York City 911 System. Those changes have been described in this article and, effective next month, will be considered the standard of care among FDNY EMS providers.

The lives of the patients for whom you provide resuscitative efforts require your knowledge of these changes, and their survival may be improved by your implementation of these changes – no different than we have seen with many of the changes recently invoked in the NYC 911 System.

Written by: **JOHN FREESE, M.D.**
 Chief Medical Director
 FDNY Office of Medical Affairs

1. **Which of the following is incorrect regarding the recommended compression depth for CPR as per the 2010 Guidelines?**
 - a. Adult compressions should be performed at 1 ½ to 2 inches.
 - b. Compressions for children should be at least 1/3 the chest depth.
 - c. Compressions for infants should be at least 1/3 the chest depth.
 - d. Compressions depth for children should be about 2 inches.
 - e. Compressions depth for infants should be about 1 ½ inches.

2. **Which of the following statements is correct regarding the initiation of CPR at present in the New York City system?**
 - a. An AED or defibrillator, if available, should be applied and used immediately.
 - b. CPR should be initiated for two minutes prior to defibrillator use in all arrests, including EMS-witnessed cases.
 - c. CPR should be initiated for two minutes prior to defibrillation only by FDNY ALS providers.
 - d. FDNY BLS and CFR providers should immediately apply a defibrillator and follow its recommendations.
 - e. CPR prior to defibrillator use has been shown to worsen survival and is no longer recommended.

3. **Which of the following is not a link in the 2010 American Heart Association Chain of Survival?**
 - a. Immediate Recognition,
 - b. Early CPR
 - c. Rapid Defibrillation
 - d. Early Advanced Life Support
 - e. Integrated Post-Cardiac Arrest Care.

4. **Which of the following is not true regarding pad placement for the management of cardiac arrest / defibrillation?**
 - a. Placement of AED / defibrillation pads in infants may require anterior-posterior placement to prevent overlap.
 - b. Several pad positions are discussed in the 2010 Guidelines with no recommendation for a particular position.
 - c. Use of the anterior-lateral (sternum-apex) position may minimize CPR interruption as compared to other positions.
 - d. Pads should ideally be placed 8 cm (~3 inches) from internal defibrillator / pacemaker devices.
 - e. If an internal device is recognized after pad placement, defibrillation should not be delayed to change placement.

5. **Which of the following is true regarding AED use in children as per the 2010 AHA Guidelines?**
 - a. AED use is not recommended in infants even if pediatric-specific pads are available.
 - b. AED use is not recommended in children unless pediatric-specific pads are available.
 - c. AED use in infants and children should occur even if pediatric-specific pads are not available.
 - d. AED use in infants and children is not necessary because shockable rhythms only occur in adults.
 - e. AEDs are not safe for use in children because the devices are not able to interpret pediatric rhythms.

6. *Which of the following reversible causes of cardiac arrest is incorrectly matched with its treatment?*
- Opioids – naloxone
 - Beta-blockers – glucagon
 - Tricyclic antidepressants – sodium bicarbonate
 - Calcium channel blockers – calcium chloride
 - Carbon monoxide – hydroxocobalamin
7. *As per the 2010 AHA Guidelines, endotracheal intubation may be performed as part of resuscitation efforts if:*
- the skill is attempted by a trained, inexperienced provider
 - waveform capnography is used for assessment of ROSC
 - ventilation is unable to be performed via bag-valve-mask
 - protective airway reflexes such as gagging are able to be suppressed with medications
 - performing endotracheal intubation can be accomplished in two attempts or less per provider
8. *Regarding the management of cardiac arrest due to drowning:*
- It should be considered a traumatic arrest.
 - The poor prognosis that accompanies traumatic arrests applies to this population.
 - Resuscitation should be initiated and the victim transported to the ED unless there is obvious death.
 - Compression-only CPR is appropriate given the lack of need for ventilation.
 - Resuscitation should be initiated only when an ice-water submersion occurred.
9. *According to the 2010 Guidelines, which of the following is incorrect regarding waveform capnography?*
- It is recommended for both confirmation of airway placement and on-going monitoring.
 - Its use received the highest possible recommendation based on the available science.
 - Despite no specific studies addressing the issue, capnography is expected to be useful with alternative airways.
 - It is recommended for use for pediatric resuscitations.
 - It is not recommended for use during neonatal resuscitations.
10. *Which of the following is true regarding the 2010 Guidelines?*
- Use of the precordial thump, though controversial, continues to be recommended.
 - Application of cricoid pressure is likely to improve intubation and continues to be recommended.
 - Termination of resuscitation decisions have not been affected by the implementation of therapeutic hypothermia.
 - Resuscitation attempts following electrical injury / lightning strikes are no longer recommended.
 - It was recognized that the only device shown to improve cardiac arrest survival is a defibrillator.

Journal CME Credit Answer Sheet

Based on the CME article, place your answers to the quiz on this answer sheet.

Respondents with a minimum grade of **80%** will receive **1 hour** of Online/Journal CME.

Please submit this page **only once**, by one of the following methods:

- FAX to 718-999-0119 or
- MAIL to FDNY OMA, 9 MetroTech Center 4th flr, Brooklyn, NY 11201

Contact the Journal CME Coordinator at 718-999-2790:

- three months before REMAC expiration for a report of your CME hours.
- for all other inquiries.

Monthly receipts are not issued. You are strongly advised to keep a copy for your records.

Note: if your information is illegible, incorrect or omitted you **will not** receive CME credit.

check one: EMT Paramedic _____
other

Name

NY State / REMAC # or "n/a" (not applicable)

Work Location

Phone number

Email address

Submit answer sheet by
the last day of this month.

November 2010 CME Quiz		
1.		Required for BLS & ALS providers
2.		
3.		
4.		
5.		
6.		Required for ALS providers only
7.		
8.		
9.		
10.		

Citywide CME – November 2010

Sessions are subject to change without notice. Please confirm through the listed contact.

Boro	Facility	Date	Time	Topic	Location	Host	Contact
BK	Kingsbrook	11/18	1530	TIA and Stroke	ED Conference Room	Dr Hew	Manny Delgado 718-363-6644
		12/16		Geriatrics			
	LICH	11/1	1000-1200	Lecture & Call Review RSVP →	Avram Conference Room "G"	Dr Vlasica	Aaron Scharf 718-780-1859
		12/6					
Lutheran	4 th Wed	1730-1930	Call Review RSVP →	Call for location →	Dr Chitnis	Dale Garcia 718-630-7230 dgarcia@lmcme.com	
MN	NY Presbyterian	TBA	TBA	TBA: call to inquire →	Stanley Children's Hospital 3959 Broadway	Dr. Schleien	Ana Doulis 212-746-0885 x2
	NYU School of Medicine	TBA	TBA	TBA: call to inquire →	Schwartz Lecture Hall 401 E. 30th Street	TBA	Jessica Kovac 212-263-3293
QN	FDNY-BOT	11/17	1030-1430	Call Review or Lecture	Fort Totten Bldg 325	TBA	swansoc@fdny.nyc.org
		12/22					
	Flushing Hosp	3 rd Wed	1330-1530	Call Review	Board Room	Dr Crupi	Mordechai Lax 718-240-5570
	NYH Queens	Thursdays	0800-0900	Call Review/Trauma Rounds	East bldg, courtyard flr	Dr Sample	Mary Ellen Zimmermann RN 718-670-2929
	Mt Sinai Qns	last Tues	1800-2100	Lecture	25-10 30 Ave, conf room	Dr. Dean	Donna Smith-Jordan 718-267-4390
	Parkway Hosp	3 rd Wed	1830-2130	Call Review	Board Room, 1st flr		pabruzzo@capitolhealthmgmt.com
Queens Hosp	2 nd Thurs	1615-1815	Call Review	Emergency Dept		718-883-3070	
	4 th Thurs						
SI	RUMC	12/2	1400	Call Review/CPR Update	MLB conference room	Dr. Ben-Eli	William Amaniera 718-818-1364
		1/18/11	1100	Call Review/Protocol Update	SIPP auditorium		

2010-2011 NYC REMAC Examination Schedule

Month	REMAC Refresher Exam (Written only - CME letter required)		REMAC Quarterly Exam - \$100 fee (Written & 3 Orals Scenarios)			NYS/DOH Written Exam
	Registration Deadline	Exam Date (on Wednesdays)	Registration Deadline	Written @18:00	Orals @09:00	
October 2010	9/30/10	10/20/10	Thursday 10/7/10	Thursday 10/21/10	Wednesday 10/27/10	
November	10/31/10	11/17/10				11/18/10
December	11/30/10	12/22/10				12/16/10
January 2011	12/31/10	1/19/11	Thursday 1/6/11	Thursday 1/20/11	Thursday 1/27/11	1/20/11
February	1/31/11	2/23/11				
March	2/28/11	3/23/11				3/24/11
April	3/31/11	4/20/11	Thursday 4/7/11	Thursday 4/21/11	Tuesday 4/26/11	
May	4/30/11	5/25/11				5/20/11
June	5/31/11	6/22/11				6/16/11
July	6/30/11	7/20/11	Thursday 7/7/11	Thursday 7/21/11	Thursday 7/28/11	
August	7/31/11	8/24/11				8/18/11
September	8/31/11	9/21/11				

The **REMAC Refresher Written examination** is offered monthly for paramedics who meet CME requirements **and** whose REMAC certifications are either current or expired **less** than 30 days. To enroll, call **718-999-7074** before the register registration deadline above. Candidates may attend an exam no more than 6 months prior to expiration. Refresher exams are held at 07:00 or 18:00 hours at FDNY-EMS Bureau of Training, Fort Totten, Queens.

The **REMAC Quarterly Written & Orals examination** is for initial certification, **or** for inadequate CME, **or** for certifications expired **more** than 30 days. Registrations **must** be postmarked by the deadline above. Email swansoc@fdny.nyc.gov for instructions. You are encouraged to **register at least 30 days** prior to the exam - seating is limited. The exam fee as above is by **money order only**. The Quarterly is held at FDNY-EMS Bureau of Training, Fort Totten, Queens.