From the Editor

** New Online Registration for REMAC Refresher Exam **

Go to www.planetReg.com/E31112555131510 (or www.nycremsco.org) & click the REGISTER link under “News & Announcements”).

See the last page of this journal for details.

** August 1, 2011 REMAC Protocol revisions in effect **

Only the August 1, 2011 protocols are in effect in the field and on certification exams. (See page 2 for outline of changes.)

Always see nycremsco.org for the current approved protocols.

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

** Mandatory REMAC Credentialing Fee **

A $25 fee has been instituted by NYC REMAC for all new or recertifying paramedic credentials. No fee is collected at the exam. After successfully completing a REMAC exam, candidates will receive an email directly from NYC REMSCO requiring a completed application and credentialing fee by money order only. On receipt, a permanent NYC REMAC certification card will be issued.

Please direct inquires on this process to NYC REMSCO at 212-870-2301
Outline of August 2011 NYC REMAC protocol changes
see REMAC Advisories 2011-02, 2011-03, 2011-04 at nycremsco.org

General Operating Procedures
- CPR: clarifies that REMAC follows AHA except as specified
- Advanced Airway Management: adds section making use of ETI and alternative airways equal except in non-cardiac arrest situations, limiting ETI to 2 total attempts
- Definition of Unstable Dysrhythmias: removes chest pain, SOB, possible MI from definition

CFR Protocols
- 300 WMD, 301 Resp Distress/Failure, 320 Traumatic Arrest, 328 Burn: updated to match BLS protocols
- 304 Non-Traumatic Chest Pain: removes blood pressure assessment and assistance or patient with NTG admin

BLS Protocols
- 403 Non-Traumatic Arrest: mandates AED availability & use; moves transport order to step 8
- 407 Wheezing: removes wheezing from list of assessment criteria; mandates OLMC contact for epinephrine to patients over 33 years-old
- 410 Anaphylaxis: mandates OLMC contact for patients over 33 years-old
- 413 Seizures: removes list of signs/symptoms
- 414 Poisoning or Drug OD: removes OLMC contact, information list, & order for dilution
- 426 Soft Tissue Injuries: adds tourniquet option
- 430 EDP: removes GCS from assessment

ALS Protocols
** “ETI” changed to “Advanced Airway Management”
- 500-A Smoke Inhalation**: changes dopamine admin to Standing Order
- 500-B Cyanide Exposure**: removes note on indications; changes dopamine admin to Standing Order
- 501 Resp Arrest: protocol deleted
- 503 Non-traumatic Arrest: limits switching from AED to ALS monitor only at the end of CPR cycle
- 503-B PEA/Asystole**: removes atropine

- 504-A Suspected MI: moves aspirin to step1; makes total doses of NTG unlimited under Standing Orders; removes morphine & Medical Control Options
- 504-B Cardiogenic Shock: moves fluid bolus and dopamine to Standing Order
- 505-A, B & C Dysrhythmias: adds note: if defibrillator’s maximum joule setting is less than 360, use equivalent cardioversion energies
- 506 APE: makes total doses of NTG unlimited under Standing Orders
- 507 Asthma & 508 COPD: makes total doses of albuterol unlimited under Standing Orders; mandates mixing of albuterol & ipratropium, limited to 3 doses
- 510 Anaphylaxis: changes methylprednisolone and dexamethasone to Standing Orders
- 515 Non-Cardiogenic Shock & 520 Traumatic Arrest: removes repeat of fluids under Medical Control Options
- 521 Head Injuries**: clarifies indication for advanced airway management & moves it to step 2
- 528 Burns & 529 Pain Management: adds fentanyl to Medical Control Options
- 531 Severe Nausea/Vomiting: new protocol
- 543 Neonate Resus: removes meconium aspiration; moved IV/IO access, epi and fluid bolus admin to Standing Orders; removes Medical Control Options
- 550 Peds Resp Arrest: adds note referring to Peds AMS protocol; changes naloxone to weight-base dosing with titration; removes ET admin of naloxone
- 551 Peds Obstructed Airway: clarifies procedure with cuffed ET tube
- 553 Peds Non-Traumatic Arrest**: increases joule settings
- 559 Peds Traumatic Arrest**

Appendices
- Appendix B Patient Assessment: clarifies transport decision; removes CUPS
- Appendix D AED Guidelines: appendix deleted
- Appendix I Hospital Listing: adds pediatric ages
- Appendix T Use of Tourniquets: appendix added
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 / Symposia / Conferences
    - Journal CME

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

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.

New 2012: REMAC Basic Written and Oral examinations are held every January, March, May, July, September & November. Registration is limited to the first 36 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

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Huie, Frederick  80300

Isaacs, Doug  80299
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Kaufman, Bradley  80289
Munjal, Kevin  80308
Schenker, Josef  80296
Schneitzer, Leila  80241
Schoenwetter, David  80304
Silverman, Lewis  80249
Sollof, Lewis  80302
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THE LATEST

In most journal CMEs, we focus on a single topic or protocol, but this month will be a little different. As the Department transitions at the end of the five-year recertification pilot into what will be announced as the next iteration of training designed to maintain both your certification and your knowledge of present-day prehospital medicine, this seemed like a good opportunity to address a couple of topics about which several of you have raised questions in the past two months – namely questions about some of the Department’s recent and on-going projects. These questions came in the form of emails, questions asked at CME sessions, chance encounters in a hallway or in the emergency department, and phone calls to OMA.

And so this month we will attempt to provide you with the latest information on a smattering of topics, including:

- results of the SmartCPR Trial,
- the latest data from Project Hypothermia,
- some early information about how QCPR is affecting cardiac arrest outcomes,
- and finally some information for the paramedics on the new focus on ondansetron (Zofran) and the potential for QT prolongation.

As the title says, you should be proud of your accomplishments. The work that you have done – and the data that you have provided – show that your efforts are providing better and better care for your patients.

SMARTCPR TRIAL

As you know, the REMAC protocols changed this past year to allow the use of defibrillators “utilizing VF waveform analysis.” This change was a direct result of the SmartCPR Trial, a joint effort involving the FDNY and the London Ambulance Service (LAS), and sponsored by Philips Healthcare (the vendor for our AEDs). The study was based upon what we know about VF, or ventricular fibrillation, and was an attempt to address a dilemma within the medical community and the American Heart Association (AHA) Guidelines.

In 2005, the AHA Guidelines recommended that two minutes of CPR be performed prior to defibrillation when the EMS response time is greater than 4-5 minutes. And the reality is that very few out-of-hospital cardiac arrests receive care within 4-5 minutes. (Start the clock when the patient collapses, allow time for someone to recognize that and call 911, NYPD takes the call and some information before passing the call over to the FDNY, the FDNY verifies only the most necessary information before releasing the call, a unit is assigned, the unit responds, the unit parks and gathers their equipment, the crew makes their way to the patient…. It all takes time.) And so, with the exception of EMS-witnessed arrests (we’ll come back to this), the recommendations and the subsequent change to the REMAC protocols was that CPR be provided for two minutes prior to rhythm analysis and defibrillation.

![Figure 1: Ventricular fibrillation](image)

This decision was based upon some good science. We know that ventricular fibrillation deteriorates rapidly over time. That electrical storm that we see on a monitor screen (Figure 1) is actually a mechanical storm within the patient’s heart – chaotic, random, constant wiggling of the ventricles that rapidly exhausts the available oxygen, glucose, and
energy stores within the heart. And so “course VF” becomes, over a matter of minutes, “fine VF.” (Figure 2) And the end result of that deterioration is that, when you defibrillate the patient, the heart does not have the necessary oxygen, glucose, and energy to restore a rhythm or a pulse. This fits what we know – shocking VF quickly after it begins is likely to restore a rhythm and a pulse, but with each passing minute the likelihood that this will happen becomes less and less.

This knowledge led some very bright individuals to change their protocols, requiring two minutes of CPR prior to the first attempt at defibrillation. And, particularly for patients whose VF had more time to deteriorate (during an EMS response time of 4-5 minutes or longer), this improved survival.

Of course, that science has been called into question by studies done since that time, resulting in the 2010 AHA Guidelines and their waffling on this recommendation. But what if there were a better way to figure out what each patient needs? Said another way, can we pick out the patients who need CPR and those who need immediate defibrillation and give both groups what they really need?

With more accuracy than EMS response time, we know that the VF itself can predict whether a patient is likely to achieve a pulse (return of spontaneous circulation, or ROSC) when you defibrillate them. As the VF deteriorates, becoming more and more “fine,” it is less likely to respond to a shock. And we know that performing quality CPR prior to defibrillation can help to reverse some of that deterioration, making the VF more “course” and more likely to respond to the defibrillation that you provide. This is what the SmartCPR Trial tried to do – to use the AEDs computer technology to quickly assess the VF waveform, decide if a shock was likely to result in ROSC, and to recommend treatment for each patient based on their heart – defibrillation for those with “good” or “more course” VF and a period of CPR for those with “bad” or “more fine” VF.

From 2006-2009, the FDNY and LAS enrolled all of the out-of-hospital cardiac arrests treated with their AEDs into the study, each AED having been programmed with either a standard AED program or the SmartCPR technology. The standard AED provided the AHA standard of care that recommended an immediate shock for all VF. The SmartCPR AEDs analyzed the VF and then recommended one of two treatments for VF – immediate defibrillation for “good” VF and two minutes of CPR for “bad” VF. The result of all of this is that “good” VF always received an immediate shock, but “bad” VF was either given the same immediate shock or CPR prior to defibrillation. The hope was that by selecting out those who needed CPR before defibrillation, we could help you to give that treatment to those patients and improve their outcomes.

As shown in Figure 3, the end result of the study is that there was no difference – when you look at all of the resuscitations, comparing those patients with “bad” VF who were treated with immediate defibrillation (Shock First) and those who were treated with CPR prior to defibrillation (CPR First – Auto2), there was no difference in outcome – both treatments resulted in the same survival rate. And if that were the end of the story, we would have still learned something. But fortunately for your patients, it was not.
What if we look only at the patients who received two minutes of quality CPR and compare them to those patients treated with immediate defibrillation?

We already mentioned that two minutes of quality CPR can “improve” VF by making it more “course” and therefore more likely to respond to defibrillation. And so the assumption is that, if the CPR that a patient receives is of good quality, it will be reflected in the VF which will improve or become more course. The result, when you compare patients with “bad” VF who are treated with immediate defibrillation (Shock First) to patients who receive two minutes of CPR prior to defibrillation and whose VF improves as a result of that CPR, what we found was… (Figure 4. (SROSC = Sustained ROSC))

When “bad” VF is given quality CPR prior to defibrillation, it results in “better” VF at the time of defibrillation, and outcomes are improved as compared to when those same patients are treated with immediate defibrillation. And as we will discuss below, other technologies that are now in place are improving the quality of the CPR that you deliver. It is the combination of these two technologies, both allowed by current protocol, that we believe will help to further improve cardiac arrest survival.

Based on these findings the CFR and BLS cardiac arrests protocols were changed, as we already described above, to allow for the use of technologies such as SmartCPR. And when an AED with this technology is used (which currently includes all of the AEDs operated by the FDNY), the AED should be applied and used immediately, allowing it to tell you whether the patient needs CPR or defibrillation.
In addition to that key data, there were a couple of other questions that we asked of the data in this study, the answers to which may be of interest to you. After all, it was your work and your patients that provided us with this information...

First, how many patients present with “good” and “bad” VF? We did not previously know how many patients were found with “good” / “course” VF and how many were found with VF that had already significantly deteriorated prior to EMS arrival. But what we found in the study, as shown in Figure 5, is that the majority of patients present with “bad” VF (below threshold), meaning that the use of a technology such as this will allow for immediate defibrillation for all of those patients with “good” VF while selecting the majority of patients who have “bad” VF and recommending for them the CPR that is essential to improving their chances of survival.

Second, are EMS response times actually important for cardiac arrest survival? And the answer is both yes and no. As shown in Figure 6, there seems to be some correlation to EMS response time early on, but after 4-5 minutes, there is no relationship between response time and survival (otherwise the curves would just continue to slant downward). And the association with EMS response time does not stop there.

We also wanted to know if a faster EMS response time correlated to better VF. Said another way, does getting to the patient more quickly make the patient’s VF less likely to have deteriorated to a “fine” VF?

If that were the case, we would expect to see the best VF values in the patients with the shortest EMS response times, and we would see that VF becomes more and more “fine” as the EMS response time becomes longer. Put onto a graph, this would look like what is shown in Figure 7. But reality is a little different.

As shown in Figure 8, there is absolutely no correlation between EMS response time and the quality of the VF that a patient will have when a defibrillator is applied. What this implies is that making a decision to provide CPR or to immediately defibrillate based upon EMS response time may be a very flawed approach. Instead, as our AEDs are now able to do, we should analyze each patient’s rhythm and allow the AED to decide what treatment is best for each individual patient. By doing that, we ensure that each patient receives the treatment that is best for them.

Figure 5: SmartCPR results showing that the majority of out-of-hospital cardiac arrests present with "bad" (below threshold) VF

Figure 6: Survival end-points vs. EMS response time.

Figure 7: How the correlation between EMS response time and VF quality might be expected to look.

Figure 8: What the correlation between EMS response time and VF quality actually looks like - there is no correlation.
The last question that we will discuss here is the question of EMS-witnessed arrests. It has always been assumed that EMS-witnessed cardiac arrest should be treated as “course” VF and immediately defibrillated. After all, if you witness the arrest and act quickly, there should be no time for the VF to deteriorate. And so we asked the question – Does VF quality correlate to the witnessed status of the arrest?

![Figure 9: How the correlation between witnessed status and VF quality might be expected to look](image)

![Figure 10: What the correlation between witnessed status and VF quality actually looks like - there is no correlation](image)

Similar to the assumption about EMS response time, one would expect that an arrest witnessed by EMS providers would have good quality (“course” or “good”) VF while an arrest witnessed by bystanders would have less quality VF and those arrests that were unwitnessed would be likely to have very poor (“bad” or “fine”) VF. And if that were the case, the VF would plot out as shown in Figure 9.

But it doesn’t. In fact, even among EMS-witnessed arrests, there is a wide range of VF quality. As shown in Figure 10, there is a very similar (in fact, statistically identical) distribution of VF quality among the EMS-witnessed, bystander-witnessed, and unwitnessed groups. What this means for your patients is that AEDs with this new technology should be used for all patient, no matter who witnessed the arrest.

And so the management of cardiac arrest on a CFR / BLS level for the FDNY does not vary as it does for other services. No matter who witnesses the arrest, CPR should be initiated only until an FDNY AED is applied, and it should be used immediately. If the patient is in VF and has “good” or “course” VF, the AED will recommend an immediate shock. If the patient is in need of CPR prior to defibrillation, regardless of EMS response time or who witnessed the arrest, the AED will be able to figure that out and recommend to you the correct treatment. And, if that treatment is CPR, providing quality compressions for the next two minutes will improve the likelihood that your patient will survive.

**QCPR**

Speaking of quality CPR, it was just over a year ago that we put the new ALS monitor (the Philips MRx) and its CPR feedback technology into place. As you know, this technology is designed to provide feedback to the providers who are performing chest compressions and ventilation on the patient, guiding them toward ideal compressions and ventilation via visual and voice feedback. We hope that this technology would help to further improve cardiac arrest survival, and the initial data look promising.

Figure 11 shows the return of spontaneous circulation rate for cardiac arrests that were witnessed by bystanders when FDNY providers were on scene. In 2003, ROSC was achieved in barely one in every five out-of-hospital cardiac arrests (20.2%). In 2008, after the implementation of the 2005 AHA guidelines and several other changes to our protocols, that number had risen to over one in every three
patients (37%). In 2010, with the introduction of intra-arrest hypothermia (more on that below), that number had risen to better than two out of every five patients (42%). And as recently as the last quarter of 2011, with introduction of QCPR, more than one half of your patients were achieving ROSC (51%).

Now some of you might be wondering if this difference really matters. You might be saying that achieving ROSC isn’t our goal – it’s getting the patient out of the hospital alive. And that is true. The data is not yet available for more recent years, but even comparing 2003 and 2008, you can see that difference.

In 2003, according to the PHENYCS study, bystander-witnessed out-of-hospital cardiac arrest survival in New York City was 2.6%. We are still trying to track down a few patients from 2008, but even if you were to presume that they did not survive (which would be unlikely since that would make them easier to locate), your efforts would have nearly doubled survival. If you presume that all patients whose outcomes are unknown did not survive, the 2008 survival rate for bystander-witnessed out-of-hospital cardiac arrest would be 6.2%. And for the patients presenting in VF, survival in 2003 was 9.6% whereas by 2008, you had increased that number to 15.7%. And it appears that those numbers continue to increase – something that we will report as soon as the final numbers are available.

**PROJECT HYPOTHERMIA**

Many of you have asked questions about Project Hypothermia and whether your efforts to initiate therapeutic hypothermia in the field, during the resuscitation, is having any effect. So we will answer three questions that have been most frequently asked: Are patients actually being cooled? Are we making a difference in outcomes? Are other patients being hurt by the fluid, especially when they develop pulmonary edema?

Infusing up to two liters of ice-cold saline would be expected to drop a patient’s core body temperature, but the question is how much that drop is. Shortly after we began using the esophageal temperature probe on the MRx, we analyzed the data collected from that device and found that patients were not only being cooled, but they were coming close to achieving target temperature even before they arrived in the ED. As shown in Figure 12, most patients experienced a decrease in core body temperature, as much as 4 degrees, with the average patient experiencing a 1.3-degree temperature drop, giving an average temperature on ED arrival of 34.4 degrees Celsius (remembering that the target for therapeutic hypothermia is between 32 and 34 degrees Celsius). So yes, you are successfully cooling patients.

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**Figure 11:** ROSC data 2003-2011

**Figure 12:** Temperature change prior to ED arrival
We recently spoke of your successes at the American Heart Association’s Resuscitation Science Symposium, describing the success of this project and in particular the results from Phase II. One of the hopes for Phase II, based on the available physiologic data, was that we would see yet another improvement in short-term outcomes as a result of the intra-arrest infusion of the ice-cold saline.

We compared nearly 5,000 resuscitations from Phase I of Project Hypothermia (when you were transporting post-ROSC patients to Cardiac Arrest Centers to receive therapeutic hypothermia) to the same number from Phase II (when paramedics in the 911 system were initiating the hypothermia early in the resuscitation via large-volume, ice-cold saline). Figure 13 shows the effects of that change. As a result of initiating hypothermia in the intra-arrest setting (and with really no other changes in our protocols), the percentage of patients achieving ROSC improved significantly. And, if you were to look at those patients who received >1,500 cc of ice-cold saline, an even greater effect was seen.

Finally, from the beginning of this project, there was concern that administering potentially large volumes of saline to patients could result in fluid overload, specifically pulmonary edema. And so we have been tracking the number of patients in whom this occurs and their outcomes.

As we just discussed, patients who received large-volume ice-cold saline saw improved outcomes. But what about those who developed pulmonary edema? And how often did that happen? Well, nearly one in every 13 patients (7.7%) seem to develop some signs of pulmonary edema. And while one may think that this would be associated with negative outcomes, Figure 14 (the last data figure in this article) shows that, in fact, their outcomes are even better than the population of cooled patients as a whole. We have yet to fully explain this, but it does suggest that there is no cause for concern.

So far, Project Hypothermia has been a success. As with these other projects, the likelihood that a cardiac arrest patient will survive and have a second chance at life has been improved through the care that you provide to them every hour of every day.

**ZOFRAN AND THE QT INTERVAL**

On September 15, 2011, the US Food and Drug Administration issued a Drug Safety Communication that described an on-going safety review of ondansetron (Zofran) due to a potential risk for QT prolongation and the potential for Torsades des Pointes (Figure 15).
Long QT syndrome (LQTS) is a genetic disorder that results in prolongation of the QT interval on the ECG and puts the patient at risk for syncope or sudden death as a result of ventricular dysrhythmias, particularly Torsades de Pointes. Similarly, some drugs prolong the QT interval and put the patient at risk for the same dysrhythmias. In both the genetic disease and the acquired / drug-induced QT prolongation, the underlying cause is an alteration of ion channels within the myocardium, particularly potassium channels. Those changes prolong repolarization within the myocardium and create the potential for a re-entry dysrhythmia within the ventricle itself.

To briefly review, the QT interval is the measurement from the initiation of the QRS complex to the end of the T wave. Normally, this measurement should be less than ¾ of the R-R interval, but because the QT interval is dependent upon the patient’s heart rate (more rapid heart rates require more rapid repolarization in order for the next cardiac cycle to occur), the actual measurement of concern has to be corrected for the patient’s heart rate and is calculated as:

\[
\text{QTc} = \frac{\text{QT}}{\sqrt{\text{RR}}} 
\]

Now before you stop reading, thinking that it is ridiculous that you are going to calculate square roots in the back of the ambulance – and you would be right – remember that the monitor calculates this interval for you. At the top of the 12-lead ECG, you will see both the actual QT and the QT corrected for rate (QTc) reports as QT / QTc. When the QTc exceeds 460ms, it is considered prolonged. And when the QTc exceeds 525ms, the patient is at significant risk for ventricular dysrhythmias.

Ondansetron has been used in the United States for more than 20 years prior to this FDA warning, so the question has to be asked – what prompted this change? And why does it only apply to this drug when so many others (over 100 in total – including drugs you commonly administer such as epinephrine, amiodarone, albuterol, and diphenhydramine)?

The FDA warning appears to the result of a single study involving eight patients who were given ondansetron and were noted to have prolongation of the QT interval. This is the only study cited in the FDA warning. And it should be noted that none of those patients developed Torsades. In fact, since 1995 there has not been a single case of ondansetron-induced Torsades in the medical literature. And so the exact reason for a warning on this specific drug is unclear. Nevertheless, it exists.

So what should we do about this warning?

The REMAC recently debated a variety of options, ranging from doing nothing to removing the drug from the protocols immediately. In the end, based upon the unknown magnitude of the problem, the decision was made to not remove the drug from the protocols and to not require any additional measures (such as OLMC contact or cardiac monitoring). But that is not to say that nothing needs to be done.
Since the patients who are at the highest risk of developing Torsades from this drug may be those who already have LQTS, a simple question of each patient (prior to ondansetron administration) should suffice: Do you or does anyone in your family have a history of something called prolonged QT syndrome or long QT? These patients will typically have had unexplained syncope in the past and/or unexplained or early death of a family member as a result of the genetic disease. If the patient does have such a history, they should not be given ondansetron. For all others patients, the drug may continue to be used, and any adverse events should be immediately reported to the FDNY On-Line Medical Control facility.

**Conclusion**

The FDNY and the New York City 9-1-1 system have undertaken a number of initiatives in recent years, each designed to improve the outcome of cardiac arrest patients. The three biggest projects – the SmartCPR Trial, the introduction of the MRx monitor, and NYC Project Hypothermia – have resulted in significant changes to cardiac arrest management in the City. But more importantly, they appear to be resulting in improved outcomes for your patients. As we continue to follow the data from these projects, we will be sure to provide you with more information about the results and their implications for your patients.

One final note... Earlier this month, Chief John McFarland passed away. And as we consider the results of these projects and your daily efforts to improve the lives of the cardiac patients that you serve, it is fitting that we remember Chief McFarland and his lifelong dedication to this cause. There are very few people in the medical profession of whom it can be said that the patients always came first - those people that have a certain spark - the thoughts that start their mornings, occupy their days and keep them from falling asleep at night are those of the patients and how to serve each of them better. Perhaps at the risk of understating how accurate a depiction this is, John McFarland was exactly that type of man. And if each of us could keep just a portion of his spark alive in us, we would all be better for it. Rest in peace, Chief.

Written by: John Freese, MD  
FDNY Chief Medical Director  
and  
Principal Investigator, SmartCPR Trial and NYC Project Hypothermia

1. Which of the following is true regarding the use of an FDNY AED for the resuscitation of an EMS-witnessed cardiac arrest?  
   a. The AED should be applied only after two minutes of CPR.  
   b. The AED should be applied immediately and used after two minutes of CPR.  
   c. The AED should be applied and used immediately.  
   d. The AED should be applied only if the patient is in VF.  
   e. The AED should not be used in EMS-witnessed cardiac arrests.

2. Which of the following is true of ventricular fibrillation?  
   a. “Fine” VF is more likely than “course” VF to achieve ROSC with immediate defibrillation.  
   b. Most VF in New York City presents as “course” or “good” VF.  
   c. EMS response time is the best predictor of outcome for a VF arrest.  
   d. Most VF is “fine” VF and will have a better outcome with CPR before defibrillation.  
   e. CPR prior to defibrillation does not affect VF.
3. The SmartCPR Trial found all of the following to be true except:
   a. There is no correlation between EMS response time and VF quality.
   b. There is no correlation between witnessed status and VF quality.
   c. In NYC most VF presents as “bad” VF.
   d. “Fine” or “bad” VF typically improves with CPR.
   e. Immediate defibrillation is better than CPR for the treatment of “bad” or “fine” VF.

4. Which of the following is not true regarding the AEDs currently used by the FDNY?
   a. They are capable of sensing shockable rhythms even when CPR is being performed.
   b. If the patient is in “good” or “course” VF, the AED will recommend an immediate shock.
   c. If the patient is in “bad” or “fine” VF, the AED will recommend CPR before defibrillation.
   d. The AEDs should be applied immediately to EMS-witnessed cardiac arrests.
   e. If the AED recommends CPR for VF, it is because the VF is “bad” or “fine” and may be improved by performing two minutes of CPR.

5. Partially as a result of the QCPR feature on the FDNY ALS cardiac monitor, what percent of the bystander-witnessed arrests that you attempt to resuscitate achieve ROSC?
   a. 6.2%  
   b. 20.2%  
   c. 37%  
   d. 42%  
   e. 51%

6. Which of the following is true regarding pulmonary edema among patients for whom large-volume, ice-cold saline is administered for the intra-arrest induction of therapeutic hypothermia?
   a. Less than 5% of patients experience pulmonary edema
   b. More than 15% of patients experience pulmonary edema
   c. Pulmonary edema results in worse outcomes
   d. Pulmonary edema is associated with likely on-scene termination of resuscitation efforts
   e. Patient with pulmonary edema are more likely than others to achieve ROSC

7. The intra-arrest administration of large-volume, ice-cold saline for the induction of hypothermia seems to have resulted in:
   a. a decline in ROSC rates
   b. no change in ROSC rates
   c. an improvement in ROSC rates
   d. the majority of patients developing pulmonary edema
   e. no change in core body temperature for most patients

8. Based upon the esophageal temperature probe data being obtained by FDNY paramedics, the intra-arrest administration of large-volume, ice-cold saline for the induction of hypothermia results in:
   a. no change in core body temperature for most patients
   b. excessive temperature drop (below 32 degrees Celsius) prior to ED arrival
   c. an increase in core body temperature for most patients
   d. near-target temperatures (34.4 degrees Celsius) prior to ED arrival
   e. a slight increase of 1.3 degrees Celsius prior to ED arrival

9. Which of the following medications is not associated with prolongation of the QT interval?
   a. magnesium sulfate  
   b. albuterol sulfate
   c. ondansetron
   d. diphenhydramine
   e. amiodarone

10. Prior to administering ondansetron, it is important to do which of the following?
    a. Initiate ECG monitoring
    b. Inquire about a family history of long QT syndrome
    c. Perform a 12-lead EKG
    d. Manually calculated the corrected QT interval (QTc)
    e. Administer a test dose to ensure that the patient will not experience Torsades
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

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Submit answer sheet by the last day of March 2012

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## Citywide CME – February-March 2012

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

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<td>Kingsbrook</td>
<td>TBA</td>
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<td>ED Conference Room</td>
<td>Dr Hew</td>
<td>Manny Delgado 718-363-6644</td>
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<td>Dr Brandler</td>
<td>Aaron Scharf 718-780-1859</td>
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<td>1730-1930</td>
<td>Call Review RSVP →</td>
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<td>Dr Chitnis</td>
<td>Dale Garcia 718-630-7230</td>
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<td><a href="mailto:dgarcia@lmcmc.com">dgarcia@lmcmc.com</a></td>
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<td>Dr Williams</td>
<td>RSVP: <a href="mailto:ssamuels@nyp.org">ssamuels@nyp.org</a></td>
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<td>Ana Doulis 212-746-0885 x2</td>
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<td>Jessica Kovac 212-263-3293</td>
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<td>Thursdays</td>
<td>0800-0900</td>
<td>Call Review/Trauma Rounds</td>
<td>East bldg, courtyard flr</td>
<td>Dr Sample</td>
<td>Mary Ellen Zimmermann RN 718-670-2929</td>
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<td>1800-2100</td>
<td>Lecture or Call Review</td>
<td>25-10 30 Ave, conf room</td>
<td>Dr Dean</td>
<td>Donna Smith-Jordan 718-267-4390</td>
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<td>1830-2130</td>
<td>Call Review</td>
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<td><a href="mailto:pabruzino@capitolhealthmgmt.com">pabruzino@capitolhealthmgmt.com</a></td>
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<td>MLB conf room</td>
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<td>William Amaniera 718-818-1364</td>
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<td>Regina McGinn Center 475 Seaview Ave</td>
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<td>Andrea Kleboe 718-226-7878</td>
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<td>346 Seguine Ave</td>
<td>Dr Barbara</td>
<td><a href="mailto:pbarbara.md@gmail.com">pbarbara.md@gmail.com</a></td>
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# 2012 NYC REMAC Examination Schedule

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<th>REMAC Basic Exam</th>
<th>NYS/DOH Written Exam</th>
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<td>(Written only - CME letter required)</td>
<td>(Written &amp; 3 Orals Scenarios)</td>
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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, go to [www.planetReg.com/E31112555131510](http://www.planetReg.com/E31112555131510) (or the REGISTER link under “News & Announcements” at nycremsco.org) before the registration deadline above. Candidates may attend an exam no more than 6 months prior to expiration.

The **REMAC Basic 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 instructions. You are encouraged to register at least 30 days prior to the exam as seating is limited. A $100 exam fee by money order is required.