QUALITY IN RESUSCITATION:
NEW EVIDENCE AND FUTURE DIRECTIONS

How agencies can track performance and improve patient survival

A SPECIAL SUPPLEMENT BROUGHT TO YOU BY

EMS WORLD® American Heart Association iSimulate
Cardiovascular disease is the number one cause of death in the United States, and deaths from cardiac arrest are a major contributor to that statistic. Cardiopulmonary resuscitation (CPR) is scientifically proven to save lives from cardiac arrest. However, multiple factors affect success in the event resuscitation is needed. Timeliness of CPR, consistent performance of high-quality CPR and the early use of a defibrillator directly impact a patient’s outcome. Effective teamwork is another critical factor for success. Not only must healthcare providers be competent in delivering high-quality CPR, but patient care teams must be coordinated and competent working together effectively. High-quality training is required to achieve this level of competency. This special supplement, produced in partnership between EMS World, RQI and iSimulate, details the steps and strategies to get there.

Better Training Saves Lives: Improved Training Leads to Better Outcomes

The American Heart Association® recently published a scientific statement in the medical journal Circulation surrounding its research into best practices for improved outcomes from resuscitation training. The scientific statement “Resuscitation Education Science: Educational Strategies to Improve Outcomes From Cardiac Arrest” outlines eight key areas associated with improved training:

1. Mastery Learning and Deliberate Practice
Learners should practice individual CPR skills and team skills until they can demonstrate mastery. Performance standards should be based on observable behaviors and important measures for patient outcomes such as time, accuracy and best practices. For deliberate practice, learners should use skill repetition paired with feedback and exercises to learn behaviors that are difficult to master or should be performed automatically.

2. Spaced Learning
One to two days of resuscitation training every couple of years is effective for short-term learning. However, learners often do not retain these skills in the long term. Shorter learning sessions every few months may improve learning outcomes. Scheduling shorter, more frequent sessions (e.g., every 3 to 6 months) can replace what providers have forgotten over time. Opportunities also exist to increase learning outside of scheduled training by debriefing providers after real clinical events or simulations.

3. Contextual Learning
Use training experiences that apply to learners’ real-world scopes of practice. Tailor the learning experience for the types of learners, their settings, and the resources available in their environment. Ensure that team composition and roles are right for learner groups and don’t be afraid to stress learners (to an extent). The right amount of stress and cognitive load can maximize engagement.
American Heart Association training and quality improvement programs incorporate all the critical factors to ensure high-quality CPR skills are being taught. The use of directive feedback devices is required in order to objectively measure CPR quality and help providers strengthen skills.

Continuous innovations offer new ways to learn, train and improve CPR competence and team effectiveness. AHA’s Resuscitation Quality Improvement (RQI) programs for EMS providers and teams deliver on those innovations with tailored programs to verify competence in high-quality CPR.

Emergency Medical Services trust AHA science and guidelines as the foundation for clinical decision making for resuscitation, STEMI, heart failure, atrial fibrillation and stroke care. Training with the AHA’s proven resuscitation programs helps to ensure the best possible patient care every day. Learn more about the AHA at www.heart.org/WhyAHA or www.rqipartners.com/ems.

REFERENCES
1. CDC, NCHS. Underlying Cause of Death 1999-2013, released Feb. 2015
2. Source: Resuscitation Education Science: Educational Strategies to Improve Outcomes From Cardiac Arrest (Circulation, June 21, 2018) www.heart.org/EducationStatement
If you or a family member were to collapse in sudden cardiac arrest, would you prefer that the responding EMS crew had trained in high-performance resuscitation within the last three months, or within the last three years?

That’s part of the thinking behind a new initiative taking place in Charles County, Maryland—a diverse municipality in the south-central region of the state. The Charles County Department of Emergency Services recently implemented two resuscitation quality improvement programs that prepare public safety responders and 9-1-1 specialists in providing high-quality CPR when responding to cardiac arrest events.

Resuscitation Quality Improvement® Telecommunicator (RQI-T) provides continuous, simulation-based mastery learning and practice to 9-1-1 specialists for delivery of high-quality telephone CPR to bystanders. RQI EMS promotes mastery of high-quality CPR through short, frequent skills sessions for EMS providers.

Both of these blended learning programs were co-developed by the American Heart Association, Laerdal Medical and the Resuscitation Academy Foundation, and delivered by RQI Partners. Charles County has enrolled a total of 25 9-1-1 specialists and 120 EMS providers in the respective programs to date.

“Charles County is committed to increasing cardiac arrest survival and continuously works to identify viable solutions that will improve outcomes,” says Kevin Seaman, MD, Charles County medical director. “RQI-T and RQI EMS are innovative programs that are changing the landscape of CPR readiness and equipping our teams with the skills, knowledge and competence to perform high-quality CPR on every cardiac arrest victim, every time. This was an easy decision to shift from traditional two-year compliance to quarterly CPR competence verification.”

Charles County’s Department of Emergency Services is the first in the United States to pilot and adopt both RQI-T and RQI EMS, according to Seaman.

“Our involvement in RQI-T and RQI EMS pilot testing offered insight into the benefits the programs provide to our staff and the community at-large,” says Tony Rose, chief of Charles County 9-1-1 and Communications. “Charles County 9-1-1 specialists and EMS providers must have confidence and competence to perform or provide high-quality CPR instruction when responding to a cardiac arrest call, and these programs give them both. We look forward to sharing our experience and results with other agencies across the state to help transform how we train and prepare for cardiac arrest events.”

Without CPR from a bystander, a cardiac arrest victim has about a 10-minute life expectancy. Research shows that continuous resuscitation training for telecommunicators can lead to a significant increase in out-of-hospital cardiac arrest survival rates and is
Charles County was awarded an RQI Innovator award for its pilot initiative to improve resuscitation training. (Photos: Charles County DES.)

SIX QUESTIONS TO ASK
How can you benchmark your community’s performance related to sudden cardiac arrest response? These questions are a good start.

What is our community’s Utstein survival percentage?
Utstein survival refers to survival to hospital discharge of cardiac patients whose arrest events were witnessed by a bystander and that involved persons who had an initial rhythm of VF or pulseless VT. The national average is 33.3%. The greatest improvements to Utstein survival may be achieved in shortening the time a bystander starts CPR.

What is the frequency of bystander CPR in our community?
The national average bystander rate is 39.2%. Early bystander CPR may triple the likelihood of survival. 9-1-1 telecommunicator-assisted telephone CPR and community training may improve the frequency of bystander CPR.

What is the time between 9-1-1 call and delivery of T-CPR in our community?
According to the American Heart Association, the minimally accepted standard is <180 seconds. High-performing systems should strive for <120 seconds.

What is our department’s median compression fraction for CPR calls?
Compression fraction measures the percentage of time where CPR compressions were provided in a resuscitation. The AHA suggests a target of 60%. High-performing EMS systems are able to demonstrate compression fractions of 80%.

How do our telecommunicators and EMS personnel train for cardiac arrest?
Ideally, providers should practice resuscitation skills quarterly. The practice should be relevant to their role and performance should be measured.

How can we measure our personnel’s performance on cardiac arrest calls?
Measuring your system’s performance during the first 600 seconds of cardiac arrest, and beyond, is invaluable.

essential to performing high-quality telephone CPR.
RQI-T is delivered through “low-dose, high-frequency” telephone CPR simulation sessions, in 45 minutes every 90 days, and designed to improve telecommunicators’ ability to rapidly identify a cardiac arrest. Additionally, the program helps reduce the time of CPR initiation from minutes to seconds when bystanders receive assistance and instruction from telecommunicators.
RQI EMS follows the same “low-dose, high-frequency” model in which Charles County’s EMTs, paramedics and firefighters engage in quarterly CPR eLearning modules and skills sessions to verify competence in high-quality CPR.
RQI-T and RQI EMS also capture real-time feedback and analytics, providing individuals and administrators with details on where to improve life-saving medical dispatch and/or CPR performance.
“We are pleased to work with Charles County in delivering RQI-T and RQI EMS to its 9-1-1 specialists and EMS providers, empowering them as critical links in the chain of survival” says Clive Patrickson, RQI Partners’ chief executive officer. “The combination of education and quality improvement activities positions these professionals to provide high-quality CPR and affords greater opportunities to help save more lives.”
“I believe low-dose, high-frequency education for EMS clinicians is the biggest innovation in my career in EMS,” says Seaman. “We have noted improved meeting/exceeding performance measures (set by AHA for T-CPR and for CPR metrics) in our pilot experience. We will eventually look to tie these improvements in meeting performance metrics with patient outcomes in cardiac arrest.”
Charles County was awarded an RQI Innovator award from RQI Partners for its pilot initiative.
For Seaman, education is the first part of moving the needle on cardiac arrest survival rates—the second is implementation. “How do we reach the minds and souls of the people we’re teaching?” he says. “How do we catapult and stimulate them so they act on this?”
“EMS is so psychomotor [driven]—you learn by doing,” Seaman says. “This concept of low dose, high frequency is on the money. To me, this is the biggest educational development in my career.” See next pages for the T-CPR program in practice.
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A Program

Helping to double survival from SCA through Telephone CPR

When a victim is suffering from Sudden Cardiac Arrest (SCA), a bystander providing CPR greatly improves the chance of survival. During this critical time, studies have shown bystanders are twice as likely to take action and provide the potentially life-saving intervention when prompted and guided by dispatchers with Telephone CPR.

Resuscitation Quality Improvement for Telecommunicators

A BLENDED EDUCATIONAL AND QUALITY IMPROVEMENT STRATEGY

QUALITY IMPROVEMENT

• Cardiac Arrest System Assessment — Tools and services to gain insight to gaps with your community’s Chain of Survival
• Baseline Call Audit — A service to measure call-taker performance during confirmed cardiac arrest cases. Call data are aggregated to illustrate trends and opportunities for improvement.
• Ongoing Measurement & Feedback — A service providing 100% case review of cardiac arrest calls and analytics on learning activities including simulations.
• Analytics — A robust application providing deep insights on individual and aggregate performance. Data may be visualized and sorted in multiple views.

EDUCATION

• Mastery Learning — Expert authored learning content delivered in highly relevant training sessions. Learners practice telephone resuscitation skills and receive immediate feedback about their performance.
• Deliberate Practice — Repetition and feedback identify opportunities for improvement. RQI-T educators guide call-takers on strategies to improve performance.
• Spaced Practice — Telephone CPR skills may deteriorate after 1 to 6 months without ongoing practice. The program contributes to maintenance of competence using a low-dose, high-frequency approach.

Combining the Power of Both to Create Continuous Quality Improvement

• Learning Management: Evidence-based, engaging curriculum designed to encourage learner retention.
• Analytics and Quality Improvement: On-going analytics and feedback on real 911 calls.
• Implementation and Support: Program guidance and best practice recommendations.


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The life-saving potential of a Telephone CPR program is stronger than any other clinical intervention.

“Bystander CPR rates are highest in communities where public safety answering points (PSAPs), or dispatch centers, provide telephone CPR (T-CPR) instructions.”

~ Michael Christopher Kurz, MD, MS-HES, FACEP, FAHA, Chair of American Heart Association T-CPR task-force

### Telephone CPR Scorecard

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**Setting a new standard in dispatcher assisted telephone CPR training**

RQI-T is a quality improvement and education program designed to help dispatch centers improve survival from cardiac arrest.

Visit resuscitationacademy.org/programs/tcpr to learn more about doubling survival from SCA through Telephone CPR

Or continue your self-assessment on at resuscitationacademy.org/assessment/

For more information about the Resuscitation Academy go to www.rqipartners.com/rqit
QUALITY IN PRACTICE: EFFECTIVE ‘CHAIN OF SURVIVAL’ SAVES LIVES AFTER SCA

By James Careless

Every data point and chart entry on a report of cardiac arrest survival rates represents another life saved. These stories are touching, dramatic and inspirational. Here is one.

New Orleans businessman/trombonist Maurice Trosclair is alive and playing today, after suffering an SCA on February 14, 2017. Trosclair’s survival and full recovery is a testament to the power of the “Chain of Survival” approach to SCA emergency treatment, with every person in the chain doing their part at the right time.

Trosclair had no idea what life had in store for him as he entered an elevator at the Lakeway office building in Metairie, La. “I’d cut my usual four-mile lunchtime run to two miles due to having a lot on my plate that day, so I was heading up to the ninth floor to shower off at the Premiere Athletic Club before returning to work,” he recalls. “I was texting my wife to wish her a Happy Valentine’s Day, when I lost consciousness and fell to the elevator floor. That was the last thing I remember, for the next four days.”

Trosclair had just suffered an SCA. Fortunately, there were two people on the elevator with him. One was Sandy Ortego, who ran directly to the health club and called 9-1-1. The other was Kim Duplessis, who stayed with Trosclair and called the last person he had been texting—his wife. “She listened in to my resuscitation for the next 40-50 minutes,” Trosclair says.

A Team Mobilizes

The elevator continued upward to the 21st floor, where People’s Health Nurse Suzanne Howard just happened to be waiting for an elevator. She saw Trosclair’s motionless body and got in the car to administer CPR and rescue breathing.

Ten minutes later, the elevator finally landed on the first floor, where People’s Health Nurse Tricha Arabie was waiting for a ride. “Apparently Nurse Howard screamed, ‘I need some help here!’, and Nurse Arabie jumped to relieve her on CPR and rescue breathing,” Trosclair says.

While this was occurring on the ground floor, Ortego had already called 9-1-1 at the Premiere Athletic Club while club manager Roy Fontenelle had located their AED. Fontenelle and club employee Kaitlyn Reis set off to find Trosclair. “Keep in mind we now had six citizens—all trained in CPR—who were trying to save my life,” Trosclair says.

New Orleans paramedic Barret Bernard also happened to be driving to the Lakeview office building at the time. “My wife works there, so I was meeting her for lunch,” Bernard recalls. “While I was outside in my car on the phone with her, one of her coworkers came running and says there was some guy who had collapsed in the elevator, where they were doing CPR, and working the AED. I had just seen the fire department responding, but I hadn’t seen EMS yet. I wasn’t on duty, but I figured I could help. I parked my car and went in as one of the..."
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It’s incredibly rewarding for any medic to be reunited with a patient.

EMS supervisors, Joe Diest, was arriving. “With the help of Bernard, the AED, fire/EMS personnel, and the other people in the elevator, Trosclair received a number of life-saving electric shocks to his heart. “We worked on him for a while and managed to get a good pulse back on scene,” says Bernard. “We got him back.”

Miracle Meaux
A full 50 minutes after his initial collapse, Trosclair was in an ambulance on his way to the hospital. (Paramedic Carl Theriot and EMT Justina Billiot were on the ambulance that treated on scene and transported him.) There Trosclair was stabilized and taken to the cath lab for treatment.

“They found 90% stenosis in my left anterior descending artery,” says Trosclair. “This, along with very low electrolytes, dehydration, arrhythmia, ventricular fibrillation and the stress I was under at the time, created a perfect storm to cause my SCA.”

The combination of fast chain of survival response, CPR-trained citizens, and just plain good luck led to Maurice Trosclair being released from hospital just four days later, wearing a yellow cape with his new nickname, Miracle Meaux.

Fate had one more good turn in store for him. After starting the nonprofit organization Heartbeat NOLA (heartbeatnola.org), Trosclair performed the national anthem Oct. 16, 2019 at EMS World Expo in New Orleans. “After I played, Barret came up to me to say that he was one of the EMTs who saved my life that day,” recalls Trosclair. “Talk about miraculous!” (Heartbeat NOLA’s mission is to raise awareness of SCA, to teach CPR and AED use, and to place more publicly accessible AEDs in and around the New Orleans area.)

“I’ve been a paramedic for 22 years, and there are only a handful of people I’ve treated who’ve survived sudden cardiac arrest, let alone fully recovered,” says Bernard. “Maurice is one of only two that I’ve met personally after the event. It’s a rare and incredibly rewarding experience for any medic to be reunited with a patient whom they’ve treated suffering from this type of emergency.”

In December 2019, Bernard and the other rescuers were invited to the release of Trosclair’s album “Grateful: A Sudden Cardiac Arrest Survivor’s Awakening” (available at www.heartbeatnola.org). “We were really honored to be at that event and to know that we were a part of what made this joyful music happen,” says Bernard.

Every Link in Place
Today, Trosclair cites the many people in his own chain of survival as the reason he’s alive and fully functional today. “It took me a couple of months to recover, but my brain rebooted and I can do everything I did before my SCA, including music,” Trosclair says. “If one link in this human chain had been missing, the results for me could have been catastrophic. But fortunately every person and link was in place when I needed it.”

AUTHOR
James Careless is a frequent contributor to EMS World.
It’s hard to replicate the true experience of the field in simulation—the chaos, the drama, the unpredictable turns that can accompany calls. Technology’s getting us closer, though.

As good as your new-hire training might be, you’re still at the mercy of the heavens when it comes time for field evaluations. Maybe you’ll get the kinds of challenging, critical-thinking-required calls that can really give you a grasp of your newcomers’ clinical talents and grace under pressure. Or maybe you’ll get sniffles and sprains all night long.

You can standardize their experience to some degree through simulation and other means, but ultimately Johnny might get tougher real-world challenges than Roy when you’re trying to evaluate them both.

“One thing we run into with our evaluation process is the variability in calls,” says Capt. Rob Walters, who oversees EMS training for the Sacramento (Calif.) Fire Department. “You never know what you’re going to get in the field. We’ve had times when instructors felt they couldn’t properly evaluate a rookie because they didn’t get any calls that required critical thinking or ALS-level care. But you’re rendering the same evaluations to people and trying to decide whether they’re ready to be paramedics with the department or need more training.”

For the next class of new hires hitting the streets this summer, the experiences will be a bit more similar. New simulation technology will let instructors bring standardized resuscitation training scenarios to the backs of department ambulances.

“We’ll create and load up these scenarios and send them out with the instructors,” says Walters, “and they can initiate the evaluation at the beginning of the shift with this device, run through evaluation of the standardized scenario, and then run the rest of the shift and see how things go.”

The technology is the REALi360 platform from iSimulate, an integrated modular system that incorporates a patient simulator, CPR feedback, and video. Using two iPads, it can mimic proprietary monitors and defibrillators from a range of popular makers, including ZOLL, Physio, Philips, and corpuls. Other modules can provide CPR feedback, live video streaming, and simulated patient records. Ectopic beats, arrhythmias and artifacts can be added to any waveform, and the whole package is wire-
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less, battery-driven, and self-contained.

Sacramento educators will be able to pose both created and on-the-fly scenarios and throw twists at their new personnel, ensuring a range of experiences. The department has around 18 such instructors, and they got a chance to experiment with the system a bit last year when it arrived. The ability to replicate the appearance and functionality of common monitors was a key asset, Walters says, as the department just switched from the ZOLL X series to Physio Control’s Lifepak 15.

The department currently has nearly 40 new hires in its academy, more than half paramedics. When they’re ready for the field, they’ll run calls in a training and exposure environment for several days before being judged by an instructor. For any who struggle in their initial evaluation, subsequent retraining can now come in different iterations. They’ll also use the REALITi system in the EMS portion of the academy. “They’ll be able to get quite a few reps on the device,” says Walters.

It’s hard to replicate the true experience of the field in simulation—the chaos, the drama, the unpredictable turns that can accompany calls. Technology’s getting us closer, though—as close as a portable way to ensure providers new in the field all get the right experiences to prove themselves.

“It’s nice to have a way to make the playing field level,” says Walters. “You can have kind of a neutral look at everybody—even regardless of the instructor, to a certain degree. This will let us more closely approximate what happens in the field, without having the artificial piece of the instructor being there, and with the ability to induce artifact—none of the perfectly clean 12-leads you might get in training.”

AUTHOR

John Erich is the senior editor for EMS World.