Potential changes questioned for advanced cardiac life support

By Jessica Berthold

The American Heart Association might want to start looking for a song with a faster tempo than “Staying Alive.”

In a few years’ time, that 100-beats-per-minute Bee Gees tune may no longer be the one experts recommend rescuers sing while giving chest compressions, said Michael O’Connor, MD, chief of the critical care section in the department of anesthesiology at the University of Chicago Medicine, during the Society of Critical Care Medicine’s Annual Congress in San Francisco in January.

Recent research indicates that chest compressions may be most effective at 125 beats per minute, since this is the rate at which spontaneous circulation is most likely to return in out-of-hospital cardiac arrest patients, he noted, citing a June 2012 study in Circulation.

“Patients with a return of spontaneous circulation have the best probability of [surviving to] discharge,” Dr. O’Connor said. “The compression rate may be changed in the next iteration of the [Advanced Cardiac Life Support] guidelines.”

The Advanced Cardiac Life Support (ACLS) guidelines are due for an update in 2015. They are published every 5 years by the American Heart Association and the International Liaison Committee on Resuscitation.

Another big change on the horizon may be a de-emphasis on hypothermia after cardiac arrest, he noted. This is due in large part to the landmark December 2013 study in the New England Journal of Medicine that found no difference in outcomes for patients whose body temperature was cooled to 33 degrees Celsius compared to 36 degrees Celsius.

“This basically confirmed the concerns of a 2011 [Critical Care Medicine] study that hypothesized that any perceived benefit to hypothermia was actually showing a difference in outcomes between patients who had fever and those who didn’t,” he said. “The [NEJM] finding is important because hypothermia is logistically difficult and expensive. This is not the last word, but it certainly will change practice at many institutions.”

Indeed, at his own facility, “We are now much less enthusiastic about cooling. If we cooled 30% to 40% of the time before, my guess is that by next year we will be cooling about 10% to 20% of the time,” he said.

Instead of aiming for a below-normal body temperature, the emphasis should be on reducing fever when it’s present, he added. “To me, it seems like 36 or 37 degrees is a reasonable target. It’s much easier to seek that target than 33 degrees. Essentially, aim for 36 and if they are hotter, cool the fever,” Dr. O’Connor said.

Also important to address in future guidelines is how long to continue CPR, in light of recent research that longer durations increase chances of survival, he said. A 2012 Lancet study found that performing CPR on patients up to 45 minutes more often led to a return of spontaneous circulation, especially in patients with ventilatory tachycardia and ventilricular fibrillation.

Adding steroids to vasopressors and epinephrine in patients with cardiac arrest may also soon become common practice, Dr. O’Connor said, citing a July 2013 JAMA study. The same goes for using extracorporeal membrane oxygenation (ECMO) in patients with simple cardiac arrest. “It’s a bust for sepsis with [acute respiratory distress syndrome], but we’ve had lots of success with ECMO in patients with straight-up cardiac arrest,” Dr. O’Connor said.

Future guidelines also should address the fact that the nature of cardiac arrest differs by location and age. “Asthma and cardiac arrest are due to cardiac reasons, while in the hospital they usually have a noncardiac cause, he noted, a distinction that has important treatment implications.”

Regardless of whether any of these topics are updated in the 2015 ACLS guidelines, physicians should be thinking about them seriously, Dr. O’Connor said.

“About 10% to 20% of the ACLS recommendations are based on randomized controlled trials. Most of the recommendations are level B [case series, historical controls, etc.], or level C [expert opinion],” Dr. O’Connor said.

This story previously appeared in ACP Hospitalist.

**CROSSED WORDS**

(Puzzle on page 4)

**BONUS ANSWER: STIMULI**

The external senses we use to navigate our environment include touch and pain, sight, smell, taste, sound and equilibrium (via the inner ear). These induce responses in our nervous system, our muscular systems, our endocrine systems, and our digestive systems. Source: Wikipedia, online at http://en.wikipedia.org/wiki/Stimulus_(physiology)

**ANSWER AND CRITIQUE**

The correct answer is B: Admit to the coronary care unit. This question can be found in MKSAP 16 in the General Internal Medicine section, item 101.

This patient should be admitted to the coronary care unit for further treatment. Because chest pain is a common clinical symptom and may have noncardiac causes, assessment of the probability that chest pain has a cardiac etiology is critical to pursuing appropriate diagnosis and treatment. This is done through an understanding of existing cardiac risk factors, the nature of the presenting symptoms, findings on physical examination, and the results of specific initial diagnostic studies, such as chest radiography and electrocardiography. Her cardiac risk factors include her age, hypertension, and hyperlipidemia, and the substernal nature of her chest pain places her in an intermediate risk category for cardiac-related pain. Coupled with her electrocardiogram (ECG) showing anterolateral ST-segment depression, her clinical picture is consistent with coronary ischemia as the cause of her chest pain. She therefore requires emergent treatment for coronary ischemia and admission to a coronary care unit.

Low-risk patients without evidence of myocardial infarction can be evaluated with an exercise or pharmacologic stress test. However, a stress test in a patient with probable acute coronary syndrome could provoke an extension of her myocardial infarction or a life-threatening arrhythmia.

CT pulmonary angiography would be helpful if there were a high probability of acute pulmonary embolism. Because this patient has symptoms and ECG findings of acute coronary syndrome and the probability of pulmonary embolism is low (she has no risk factors or physical examination findings to support the diagnosis of venous thromboembolism and her symptoms can be explained by an alternative diagnosis), a CT pulmonary angiogram is not indicated.

NSAIDs are short-term for the treatment of acute pericarditis or musculoskeletal chest wall pain. The pain of pericarditis is characteristically pleuritic in nature. In addition, the characteristic ECG finding in pericarditis is ST-segment elevation throughout the precordial and limb leads rather than regional ST-segment depression, as in this patient. ECG changes are not present in musculoskeletal chest pain.

**KEY POINT**

Assessment of chest pain is based on preexisting risks for cardiac or other diseases, elements of the history and physical examination, and appropriate, directed testing based on the likely cause of chest symptoms.