Using Simulation to Implement an OR Cardiac Arrest Crisis Checklist

DARLEEN DAGEY, MSN, RN, CNOR

ABSTRACT

Crisis checklists are cognitive aids used to coordinate care during critical events. Simulation training is a method to validate process improvement initiatives such as checklist implementation. In response to concerns staff members expressed regarding their comfort level when responding to infrequent occurrences such as cardiac arrest and other OR emergencies, the OR Comprehensive Unit-based Safety Program team at our facility decided to institute the use of crisis checklists in the OR during critical events. We provided 90-minute education sessions, simulation opportunities, and debriefings to help staff members become more comfortable using these checklists. Based on program evaluations, 80% of staff members who participated in the training expressed an increased comfort level when caring for a patient in cardiac arrest. *AORN J* 105 *(January 2017) 67-72. © AORN, Inc, 2017. http://dx.doi.org/10.1016/j.aorn.2016.11.002*

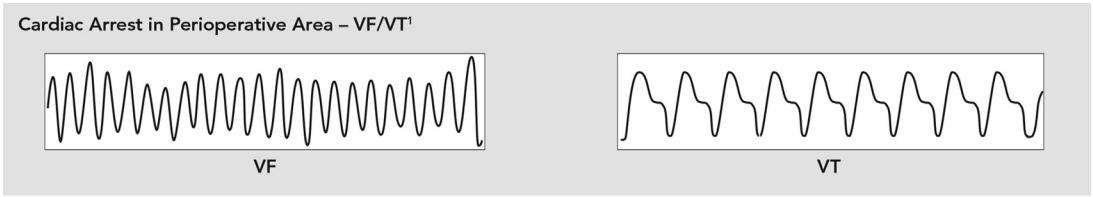
Key words: *checklists, cardiac arrest, OR emergencies, crisis, simulation.*

Sibley Memorial Hospital, a 318-bed community hospital in Washington, DC, houses 14 ORs, and 10,595 procedures per year are performed here. Because OR emergencies (eg, cardiac arrests) are infrequent and staff members expressed concern about their ability to respond appropriately, our OR Comprehensive Unit-based Safety Program (CUSP) team evaluated instituting crisis checklists. Comprehensive unit-based safety programs "make care safer by improving the foundation of how your physicians, nurses, and other clinical team members work together."[1] Our CUSP team includes RN and surgical technologist unit champions, physician champions (ie, surgeons, anesthesiologists), a facilitator, an executive member, an OR manager, and the director of perioperative services. This group saw an opportunity to improve patient safety and surgical care by helping staff members acquire the skills and confidence to respond effectively to cardiac arrests in the OR. Crisis checklists and similar emergency manuals for critical events have proven successful for safety in the aviation industry and are now being used in health care facilities across the United States.[2-4]

Simulations also have been shown to be effective at easing discomfort and raising skill levels of staff members faced with new skill acquisition.[3,5] Our CUSP team identified a resource in the Johns Hopkins Medicine affiliates group to assist with simulation training. Beginning in October 2014, the OR CUSP team collaborated with the Johns Hopkins Medicine Simulation Center in Baltimore, Maryland, to provide an opportunity for staff members to practice responding to a cardiac arrest and to test the validity of the proposed crisis checklist. The training received overwhelming support from the executive team and physician leaders, and funding for the project was provided by the Sibley Foundation, which supports nursing education.

The CUSP team introduced the concept of crisis checklists to perioperative nursing and anesthesia professionals before their participation in the 90-minute OR cardiac arrest simulations.

http://dx.doi.org/10.1016/j.aorn.2016.11.002



Start

1. **Call ext. XXXX and identify arrest code**
2. **Ask "Who will be the code leader?"**
3. **Say "Shock patient as soon as defibrillator arrives"**
4. **Retrieve arrest cart**
5. **Put backboard under patient, supine position**
6. **Turn FIO_2 to 100% and turn off volatile anesthetics**
7. **Start CPR-defibrillation/assessment cycle**
   - **Perform CPR**
     - Hard and fast; 100-120 compressions per minute
     - Ensure full chest recoil with no more than 10 seconds off the chest
     - 8-10 breaths per minute; do not overventilate
   - **Defibrillate**
     - Shock at 150 J
     - Resume compressions immediately after shock for 2 min
     - Shock at 150 J
   - **Give epinephrine**
     - Repeat epinephrine every 3-5 min
   - **Consider giving antiarrhythmics (eg, for refractory VF/VT amiodarone is preferred if available)**
   - **Assess every 2 min**
     - Change CPR compression provider
     - Check $ETCO_2$
       - If <10 mm Hg, evaluate CPR technique
       - Sudden increase to >40 mm Hg may indicate return of spontaneous circulation
     - Treat reversible causes; consider reading aloud Hs and Ts
     - Check rhythm; if rhythm organized, check pulse
     - If VF/VT continues, resume CPR-defibrillation/assessment cycle (ie, repeat sequence starting at step 6)
8. **With ROSC**
   - **Go to ROSC checklist**

IO = intraosseous; J = joule; VF = ventricular fibrillation; VT = ventricular tachycardia; FIO_2 = fraction of inspired oxygen; CPR = cardiopulmonary resuscitation; $ETCO_2$ = end-tidal carbon dioxide; mm Hg = millimeters of mercury; ROSC = return of spontaneous circulation.

Reference

1. *American Heart Association.* Advanced Cardiovascular Life Support Provider Manual. *Dallas, TX: American Heart Association; 2016.*

Figure 1. The checklist for responding to a cardiac arrest with ventricular fibrillation/ventricular tachycardia in the perioperative area.

The team provided a debriefing after each session and asked participants to identify at least one new piece of information learned. All participants were asked to complete a program evaluation.

CHECKLIST BENEFITS

The concept of using a checklist was not new to staff members. Checklists are commonly used during surgical verifications or time outs and to identify all necessary preoperative criteria (eg, laboratory tests and results, consents). Using a checklist during an emergency was a new idea for nursing and anesthesia staff members, however.

The purpose of the checklist created by the CUSP team is to provide the appropriate steps, medication dosages and treatments, and role assignments during emergencies. During high-stress, emotionally charged situations, cognitive information is less likely to be processed effectively.[6,7] A checklist provides instructions and considerations to help ensure that all vital steps are completed.[2] The CUSP team believes that successful implementation of crisis checklists will help maintain a strong patient safety culture at Sibley.

IMPLEMENTING A CHECKLIST

Several steps were taken to ensure effective implementation of the crisis checklist. The CUSP team began by looking at other hospitals that had successfully implemented crisis checklists or emergency manuals. The team also conducted a literature review of surgical crisis checklists and simulation-based training