Pediatric Emergency Medicine Simulation Curriculum: Ventricular Fibrillation Scenario

Created: April 4, 2012
Modified: July 29, 2014
<table>
<thead>
<tr>
<th></th>
<th>Resource Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Author Contact Information</td>
</tr>
<tr>
<td>2</td>
<td>Description of Scenario</td>
</tr>
<tr>
<td>3</td>
<td>Target Trainees</td>
</tr>
<tr>
<td>4</td>
<td>Prerequisite Knowledge and Skills</td>
</tr>
<tr>
<td>5</td>
<td>Goals and Objectives</td>
</tr>
<tr>
<td>6</td>
<td>Instructor Notes</td>
</tr>
<tr>
<td>7</td>
<td>Common Errors &amp; Prevention Strategies</td>
</tr>
<tr>
<td>8</td>
<td>Didactics</td>
</tr>
<tr>
<td>9</td>
<td>Skill Training</td>
</tr>
<tr>
<td>10</td>
<td>Equipment Setup</td>
</tr>
<tr>
<td>11</td>
<td>Assessment Methods</td>
</tr>
<tr>
<td>12</td>
<td>Appendices</td>
</tr>
</tbody>
</table>
1. Author Contact Information

Kimberly Stone, MD, MA, MS
Assistant Professor
Department of Pediatrics, Division of Emergency Medicine
Seattle Children’s Hospital
Mail-stop MB.7.520
4800 Sand Point Way NE
Seattle WA 98105
Email: Kimberly.stone@seattlechildrens.org

Jennifer R. Reid, MD
Assistant Professor
Department of Pediatrics, Division of Emergency Medicine
Seattle Children’s Hospital
Mail-stop MB.7.520
4800 Sand Point Way NE
Seattle WA 98105
Email: jennifer.reid@seattlechildrens.org
2. Description of Scenario

Scenario Overview
This Scenario teaches learners to recognize and manage pediatric ventricular fibrillation.

The scenario is simulation-based, designed for manikin-based simulation equipment, with an integrated team communication focus.

Learners will participate in a simulation scenario and be asked to identify the signs and symptoms of ventricular fibrillation and its management (See Appendix A).

At the end of training, the learners should be able to recognize the seriousness of the situation and recruit a full resuscitation team. The primary complication for the team to recognize and manage is cardiopulmonary failure.

Educational Rationale on How the Scenario Generalizes to Real-Life Circumstances
Ventricular fibrillation in the pediatric population is usually secondary to a predisposing condition or rhythm- such as cardiomyopathy, long QT syndrome, congenital heart disease, myocarditis, coronary artery disease, electrolyte abnormalities, drug intoxication (e.g. cocaine or digoxin), and a sharp blow to the chest or trauma. It is seen in approximately 25% of in-hospital arrests.

Ventricular fibrillation is characterized by not having an organized rhythm and no cardiac output. Unless an organized rhythm is reinstated, the patient will die.

Medical providers must recognize children in ventricular fibrillation early when they are more likely to respond to treatment. CPR should be initiated without delay, with a goal to push “hard and fast”, allowing for full chest recoil. Interruptions should be minimized during rhythm checks, ventilations and defibrillations. Unlike adults, children need both compressions and ventilations. However, defibrillation should occur as soon as possible, it should not be delayed for ventilation. Automatic external defibrillators (AEDs) may be used in children between 1-8 yrs of age, preferably with a pediatric dose attenuator. If the first two attempts to defibrillate back to a normal sinus rhythm are unsuccessful, the Pediatric Advanced Life Support (PALS) algorithm for pulseless arrest should continue to be followed.

The goal of this scenario is to provide the learner with an opportunity to manage pediatric ventricular fibrillation, where the correct steps need to be taken in a limited period of time. This is the most comprehensive resource focused on pediatric ventricular fibrillation that we have identified at this time.

Key elements include the primary survey, eliciting critical history (inadequate fluid intake, increased losses, cardiac history), recognizing the need to call for team assistance early in an event, recognizing ventricular fibrillation (tachycardia, hypotension, diminished pulses, delayed capillary refill, altered mental status) and treating ventricular fibrillation (defibrillation).

Duration of Training Session: 1 hour

Frequency of Scenario: Goal is to have each learner experience this scenario approximately once/year. We have a non-mandatory curriculum that offers a different scenario every 2 weeks. This particular
2. Description of Scenario

Scenario is offered approximately 4 times a year to try to ensure that all our learners are exposed at least once.

**Number of Trainees per Session:** 5 to 10.

This scenario is most realistic and achieves maximal learning, if it is conducted as an Interprofessional Educational event (IPE). In this model, all participants are functioning in their “normal” roles. E.g.: nurses perform nursing roles, physicians perform physician roles, if a more experienced physician would normally function as the team leader, s/he plays that role in the simulation. In addition to having interprofessional participants, we have found that the discussion is much richer (and models interprofessional collaboration) when the instructors are also interprofessional, giving each profession an “expert” voice.

Realism is even better if the number of participants mirrors the “normal” number /mix of respondents. E.g. If your response team typically consist of 3 physicians, 3 nurses and a respiratory therapist- try to have your participant team include this number and professional mix. It will give them the most realistic experience of the situation.

If necessary, trainees or confederates can “act” to cover any unfilled roles, or those roles can be left unfilled. The instructor should be aware that realism will be compromised and learning objectives may be harder to achieve if these compromises are made.
3. Target Trainees

<table>
<thead>
<tr>
<th>Primary:</th>
<th>Pediatric and emergency medicine residents, fellows, faculty and nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary:</td>
<td>N/A</td>
</tr>
</tbody>
</table>
4. Prerequisite Knowledge and Skills

Required background knowledge:

- Signs and symptoms of ventricular fibrillation
- Anatomy related to CPR and placement of defibrillation pads/paddles
- PALS algorithm for the treatment of pulseless arrest
- TeamSTEPPS communication terminology (See Appendix B)

Required background skills expected in trainees prior to receiving training in the target scenario:

- Assessment of breathing and circulation
- How to provide supplemental oxygen
- How to provide CPR
- How to safely use a defibrillator
5. Goals and Objectives

**Goal 1: Recognition of ventricular fibrillation**
The learner will demonstrate recognition of ventricular fibrillation. *(ACGME Milestones\(^1\): Medical Knowledge\(^6\), Patient Care\(^8\), Interpersonal and Communication Skills\(^5\), Professionalism\(^9\), Systems-based Practice\(^6\))

**Objective 1a - Demonstrate initial patient assessment** \(^{[A, B, C, D]}\)
The learner will be expected to discuss what s/he would look for in an initial physical examination (primary survey e.g. airway, breathing, circulation, disability, exposure) and history (SAMPLE- Signs and symptoms, Allergies, Medications, Past medical history, Last meal, and Events) of any pediatric patient s/he is evaluating.

**Objective 1b - Apply appropriate monitoring** \(^{[A, B, C]}\)
The learner should apply basic monitoring standards for a patient with an arrhythmia (cardiorespiratory monitors, pulse oximetry, blood pressure, and temperature). S/he should obtain a patient weight or accurate estimate (e.g. Broselow-Luten Tape).

**Objective 1c - Identification of ventricular fibrillation** \(^{[A, B, C]}\)
The learner should identify signs of ventricular fibrillation (unorganized electrical rhythm without p waves or QRS complex, pulselessness, loss of blood pressure and respirations, unresponsive).

**Goal 2: Management of ventricular fibrillation**
The learner will treat ventricular fibrillation in a safe and professional manner. *(ACGME Milestones\(^4\): Medical Knowledge\(^6\), Patient Care\(^8\), Interpersonal and Communication Skills\(^5\), Professionalism\(^9\), Systems-based Practice\(^6\))

**Objective 2a – Initiate Cardiopulmonary Resuscitation** \(^{[A, B]}\)
The learner should initiate CPR, pushing hard and fast, allowing for full chest recoil. Supplemental oxygen should be used, in addition to supplemental ventilation, to maximize oxygen delivery.

**Objective 2b – Apply Defibrillation** \(^{[A, B]}\)
The learner should defibrillate as soon as possible. Using either a defibrillator or an AED (approved for use in children between 1-8 yrs of age with a pediatric dose attenuator), follow PALS guidelines. As of 2010, PALS recommends the first dose of 2 J/kg, followed by CPR (~2 min or 5 cycles), then subsequent doses of 4-10J/kg, every 2 min, while the patient remains in a shockable rhythm.

**Objective 2c – Provide medical treatment according to PALS guidelines** \(^{[A, B]}\)
The learner should continue to follow the PALS algorithm for pulseless arrest if the first two shocks fail. After the second shock, give epinephrine 0.01 mg/kg of 1:10,000 concentration IV or IO. If there is no IV/IO access, give epinephrine 0.1 mg/kg of 1:1,000 concentration, via endotracheal tube. Epinephrine may be repeated every 3-5 minutes. After the third shock, if the patient remains in ventricular fibrillation, give amiodarone 5 mg/kg. Amiodarone may be repeated up to 2 times for refractory ventricular fibrillation.
5. Goals and Objectives

Objective 2d – *Assemble and demonstrate equipment setup* \([A, B, C, D]\)
The learner should be able to set up the equipment required to treat a patient in ventricular fibrillation: defibrillator or AED, supplemental oxygen, bag mask ventilation, intravenous or intraosseous access equipment.

Objective 2e – *Demonstrate technical skills* \([6]\)
The learner should position the patient for defibrillation. Using safe technique to clear the patient and protect team members, the learner should shock the patient.

Goal 3: Teamwork and Communication Skills
The learner will become more skilled in the management and leadership of emergency personnel including physicians, nurses, and ancillary personnel.

*ACGME Milestones*: Medical Knowledge\(^A\), Patient Care\(^B\), Interpersonal and Communication Skills\(^C\), Professionalism\(^D\), Systems-based Practice\(^E\)

Objective 3a – *Create team structure and leadership* \([C,D]\)
The learner will be exposed to a full-scale manikin-based simulation, in which the learners are faced with a life threatening emergency due to seizure with respiratory insufficiency. They will be expected to clearly identify and maintain a team leader and team member roles.

Objective 3b – *Employ effective communication skills* \([C,D]\)
The learner will be required to direct available resources to manage seizure with respiratory insufficiency. The team will be expected to *brief* at the beginning of the scenario and *huddle* during the scenario. The goal of *briefing* and *huddling* is to create a shared mental model, so that the team is on the same page regarding working diagnoses, treatment priorities and plan of care. S/he will coordinate, direct and communicate with a resuscitation team using directed call-out and check-back.
6. Instructor Notes

These are general “tips”. Everything in this section is included because at one time or another, we forgot to do it. The result was a suboptimal learning experience.

a. Environmental Set Up (See Section 10)
   - Try to re-create the location, look, and feel of the participants’ work environment.
   - Place simulator in a gown, diaper, etc. in order to maximize realism.

b. Pre-Simulation Introduction
   - Group introductions. Have everyone in the group introduce themselves and their role for the simulation.
   - Share a “learning contract” with participants. An example of some elements you may include: “We believe each of you is intelligent, well-trained, and doing their best” (adapted from the Center for Medical Simulation, Cambridge, MA)⁴. “We recognize this is a fictitious environment. We ask you to stretch your imagination, go beyond your comfort zone and help promote each others’ learning”.
   - Share ground rules with participants (e.g. “Treat others with respect, maintain confidentiality”).
   - Share the agenda (e.g. “We will begin with a 15 min simulation followed by a 30 min debrief.”).
   - Orient your participants (e.g. Review capabilities of simulator being used. Review location/availability of equipment/supplies. Identify facilitator to whom requests/questions should be directed during the simulation).
   - Review safety issues (e.g. correct use of defibrillator).
   - Review principles of teamwork and communication – TeamSTEPPS² (See Appendix B). Review expectations of team leaders and members: take time to plan before a patient arrives (brief) and “get the team on the same page” (huddle).

c. Scenario Notes
   - A “trigger” is a critical time or event that signifies the start or end of a Stage in the scenario. These are the critical steps that help the scenario progress. Please review these prior to conducting your session.
   - Prompts. Sometimes learners get stuck- miss a physical exam finding, critical piece of history or don’t know/fail to implement a critical action that’s needed to help the team meet a learning objective or advance to the next stage. When this happens, the facilitator, who is actively monitoring the team’s progress, may choose to ask a question, state a cue or have a third party “drop a critical hint” to mobilize the team towards meeting the objectives. The instructor needs to balance “keeping the team from failing to met the learning objectives” with the team’s opportunity to work through a problem. Careful not to shift it from self-discovery to a lecture!

d. Debriefing (See Appendix C)
   - Remember: Try to have participants step away from the simulator, into a different space (e.g. chairs in a circle or separate room). This physical cue helps participants shift from “doing” - a clinical focus to “reflecting” - a learning focus.
   - Remind participants that the debriefing time is intended to focus on the group’s performance.

e. Sample Agenda (times will vary depending on participant familiarity with simulation)
   - 0-15 min Set-up
   - 15-30 min Pre-Simulation Introduction
6. Instructor Notes

- 30-45 min  Scenario
- 45-80 min  Debrief
- 80-90 min  Instructors clean up, identify opportunities for improvement and follow-up

f. Learner considerations

- Over time, we have discovered that each group of learners’ needs vary. Thus, we have included a range of potential objectives, which can be tailored to suit different learner groups. E.g. for our less experienced clinical providers, we focus more on the medical decision making goals. For our more advanced providers, we focus more on the team work and communication goals.

- If you are instructing more experienced learners, consider “titrating” the learning objectives. E.g. for learners that have limited medical knowledge, delivering one defibrillation will be all that we require to move them from Stage 2 to Stage 3. For experienced providers, they need to administer at least 3 defibrillations, 1 dose of epinephrine, recruiting all the additional personnel and equipment they will need, before we will advance from Stage 2 to Stage 3.

- If you are instructing more experienced learners, consider “titrating” the scenario’s signal to noise ratio. E.g. for resident learner groups, we will run the scenario as written. For those with more experience, we might add more “noise”. This could be an actor playing the role of a parent who gives insufficient history, is crying or questioning the team (providing a distraction).

- Participants. The most realistic and richest learning experiences occur when all the participants are performing their “normal” roles. E.g. physician functions as physician, nurse as a nurse, respiratory therapist as a respiratory therapist. If your learner group does not contain the full spectrum of “normal team members”, you may have to either ask some participants to function in different roles or provide “actors” to fill the necessary roles. Recognize that realism is going to be lost and learning opportunities missed. E.g. If the group is all physicians, none of your learners may have drug measuring/administration experience. As an instructor, you will need to make decisions on how much you want them to do to “get credit” and be able to advance to the next stage in the scenario. Is it enough to be able to order the drug? Do they need to find the vial? Draw it up? Administer it to the simulator? Your answer should be driven on helping your learners to achieve the learning objectives.

- This scenario is part of the Pediatric Emergency Medicine Simulation Curriculum. The curriculum includes didactic sessions, skills sessions, and patient based education on topics ranging from septic shock to resuscitation skills to communication and teamwork. In addition, it includes several simulation scenario modules, presented on a rotating basis. Published scenario modules are available on MedEdPORTAL.

- Impact of the curriculum. We have studied our Pediatric Emergency Medicine Simulation Curriculum as a whole. We have observed that over the course of exposure to our curriculum for a year, our learners’ performance (in medical decision making, technical skills and teamwork) improves, achieving statistical significance in team performance scores. There is a dose response (greater exposure to the curriculum, better performance).
These reflect our “lessons learned”. We’ve watched teams over the years, repeatedly make the same types of mistakes. Below is a list of common errors. We’ve also spent years trying to figure out how to best address those errors- thus the prevention/remediation strategies following each type of error.

<table>
<thead>
<tr>
<th>Error Description</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to recognize ventricular fibrillation.</td>
<td><strong>Strategy:</strong> Review signs of ventricular fibrillation: disorganized rhythm without P waves or QRS complex, pulselessness, apnea, unresponsiveness.</td>
</tr>
<tr>
<td>b. Failure to treat ventricular fibrillation.</td>
<td><strong>Strategy:</strong> Review treatment for ventricular fibrillation- PALS algorithm for pulseless arrest.</td>
</tr>
<tr>
<td>c. Failure to rapidly initiate CPR/minimize interruptions in CPR.</td>
<td><strong>Strategy:</strong> Review goal of rapid onset of CPR &amp; minimal interruptions, to maximize coronary artery perfusion and oxygen delivery.</td>
</tr>
<tr>
<td>d. Failure to deliver timely defibrillation.</td>
<td><strong>Strategy:</strong> Review equipment, use, safety principles and goals of speedy defibrillation.</td>
</tr>
<tr>
<td>e. Inefficient teamwork</td>
<td><strong>Strategy:</strong> Review need to brief (discuss team roles) prior to a critical situation and huddle (ad-hoc planning to re-establish situation awareness) during a crisis.</td>
</tr>
<tr>
<td>f. Inefficient communication: lack of call-out</td>
<td><strong>Strategy:</strong> Review importance of directed communication: “Survey physician- What’s the circulatory status?”</td>
</tr>
<tr>
<td>g. Inefficient communication: lack of check-back</td>
<td><strong>Strategy:</strong> Review use of closed-loop communication:</td>
</tr>
<tr>
<td></td>
<td>Team Leader: “Defibrillate, 2 J/kg for a total of 20 Joules”.</td>
</tr>
<tr>
<td></td>
<td>Medication Preparation Nurse: “Defibrillate 20 Joules”.</td>
</tr>
<tr>
<td></td>
<td>Team Leader: “Correct”.</td>
</tr>
<tr>
<td>h. Inefficient communication: lack of shared mental model</td>
<td><strong>Strategy:</strong> Review use/request for team summaries with the establishment of a working diagnosis, rhythm change, clinical change, or lack of improvement</td>
</tr>
<tr>
<td></td>
<td>Medication Administration Nurse: “Team leader, can you summarize?”</td>
</tr>
</tbody>
</table>

**General strategies to solve the problems**

- Increase knowledge base: assigned reading, lectures, teamwork and communication training, review of key principles just before the simulation
- Debriefing focused to re-evaluate critical thinking and actions
- Teaching points based on errors
- Regular simulation training to avoid previous mistakes
- Behavior change comes slowly, over time. We believe it’s critical to create opportunities for your learners to develop their skills over time.
8. Didactics

Ventricular Fibrillation Learner Handout (See Appendix D).

- We recommend sharing these with your learners BEFORE your simulation, if you want them to have the information “freshly reviewed” and ready to apply, AVAILABLE DURING your simulation if you want them to have a “reference” to turn to, or AFTER your simulation, if you want them to be able to compare their actions to a reference.

- When you share it with them should match your educational goals and philosophy: e.g. formative vs. summative.
Skills Training Scenario:

Patient

<table>
<thead>
<tr>
<th>Age: 10 Months</th>
<th>Weight: 8 kg</th>
<th>Gender: Male</th>
</tr>
</thead>
</table>

Scenario: The triage nurse is bringing back an ill-appearing child with a cardiac history. Initially the patient is in sinus tachycardia and is dehydrated. Anticipated interventions include primary assessment, obtaining history, oxygen, IV access and IV fluids. The patient then develops ventricular fibrillation. Anticipated interventions include CPR, defibrillation and administration of epinephrine. The patient stabilizes after the 3rd defibrillation.

Learning Objectives:

1. Recognize ventricular fibrillation
   a. Initial patient assessment
      i. SAMPLE history, initial physical
   b. Appropriate monitoring
      ii. Heart & respiratory, oximetry, blood pressure, temperature
   c. Identification of ventricular fibrillation
      iii. Wide complex tachycardia with irregular amplitude and periodicity
      iv. Pulseless

2. Manage ventricular fibrillation
   a. Begin CPR
   b. Initial defibrillation at 2-4 Joules/kg
      i. Appropriately charge defibrillator
      ii. Appropriately clear self and others
   c. Resume CPR for 5 cycles
   d. Reassess rhythm, proceed with algorithm if indicated
   e. Second and subsequent defibrillation at 4-10 Joules/kg
   f. Give appropriate dose of epinephrine
      i. Epinephrine 1:10,000
         • 0.01 mg/kg (0.1 mL/kg) IV/IO OR
      ii. Epinephrine 1:1,000
         • 0.1 mg/kg (0.1 mL/kg) ETT
   g. Repeat c-e as indicated
   h. Second medication after Epinephrine is Amiodarone 5mg/kg
   i. Consider and possibly treat contributing factors

Learning Objectives continued:

3. Demonstrate effective teamwork skills
   a. Create team structure and leadership
      i. Determine and indicate team leader and member roles
   b. Employ effective communication skills
      i. Brief prior to starting the scenario
      ii. Huddle as needed during the scenario
      iii. Utilize directed communication
      iv. Utilize check-back for closed loop communication
### Scenario Intro:

David is a 10 month old boy with a history of congenital heart disease. He has 2 days of fever (Temperature to 103°F), cough, vomiting (nonbloody, nonbilious) and diarrhea (nonbloody). He has not been eating well. Last wet diapers were 12 hours ago. No known sick contacts.

### Facilitator Notes:

Give team intro outside the simulation area. Patient is initially clothed. Not on monitors.

**Past Medical History (PMH): (If asked)**

History of a large ventricular septal defect, partially closed, still with a residual VSD. Poor growth over last 6 months, tiring with feeds. Medications: Digoxin, lasix.

### Prelude: 0-3 minutes

Give team the scenario intro outside the simulation area. You may answer any questions (if asked) with information from the Scenario Introduction. Give them up to three minutes to plan: decide on roles (you may pre-assign them or allow self-determination, depending on learning objectives and institutional policy), identify priorities, and organize before entering the simulation area.

### Act 1: Initial Assessment: 3-5 minutes

<table>
<thead>
<tr>
<th>HR</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpO2</td>
<td>92%</td>
</tr>
<tr>
<td>BP</td>
<td>90/52</td>
</tr>
<tr>
<td>RR</td>
<td>36</td>
</tr>
<tr>
<td>Temp</td>
<td>38.3</td>
</tr>
</tbody>
</table>

- No stridor, crying softly
- No retractions
- Loud systolic murmur present

At 5 minutes → Go to Act 2

### Teaching Objectives

- Primary Assessment
  - ABCDE
- Recognize hypoxia and dehydration

### Instructor Information

**Exam (If asked):**

- Some crying, looks tired and ill
- Extremities cool, capillary refill 3 seconds
- No hepatosplenomegaly
- No rashes

**Responses:**

- PMH as above
- EKG – “coming”
- Labs – “sending”
9. Skill Training

Act 2: Ventricular Fibrillation: 5-13 minutes, maximum

<table>
<thead>
<tr>
<th>HR</th>
<th>Ventricular fibrillation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spo2</td>
<td>Not reading</td>
</tr>
<tr>
<td>BP</td>
<td>Not reading</td>
</tr>
<tr>
<td>RR</td>
<td>None</td>
</tr>
<tr>
<td>Temp</td>
<td>38.3</td>
</tr>
</tbody>
</table>

### Technologist Information
- Ventricular fibrillation on the monitor
- Pt stops crying
- Pt stops breathing
- After 3rd defibrillation or 8 min max in this Act → Go to Act 3

### Teaching Objectives
- Recognize Ventricular fibrillation, initiate CPR and follow PALS algorithm
  - Bag-mask ventilation
  - CPR with backboard
  - Defibrillation
  - Epinephrine
- Consider causes of Ventricular fibrillation

### Instructor Information
**Exam (if asked):**
- Unresponsive
- No respiratory effort
- Distal extremities cold
- No palpable pulses

**Responses:**
- 1st defibrillation
  - Remains in ventricular fibrillation
- 2nd defibrillation
  - Remains in ventricular fibrillation
  - Epinephrine
- 3rd defibrillation
  - Remains in ventricular fibrillation
  - Resumes sinus tachycardia
### 9. Skill Training

**Act 3: Resolution: 13-15 minutes, maximum**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>176</td>
</tr>
<tr>
<td>Spo2</td>
<td>100% BMV</td>
</tr>
<tr>
<td>BP</td>
<td>82/44</td>
</tr>
<tr>
<td>RR</td>
<td>BMV</td>
</tr>
<tr>
<td>Temp</td>
<td>38.3</td>
</tr>
</tbody>
</table>

#### Technologist Information
- Sinus tachycardiac
- No stridor
- Still apneic

End scenario after 2 min in this Act.

#### Teaching Objectives
- Reassess/support ABC’s
  - Continue bag-mask ventilation
  - Prepare for intubation
- Consider causes of Ventricular fibrillation

#### Instructor Information
**Exam (if asked):**
- Weak but palpable pulses
- Remains obtunded
- Distal extremities cool
- Capillary refill 4 seconds

**Responses:**
- Any requests “pending”
Below are examples of learning objective based statements & questions you may use to debrief the team. Please see Appendix C- Debriefing Overview for general recommendations on overall debriefing format.

### Supporting Airway and Breathing with Cardiac Disturbances

<table>
<thead>
<tr>
<th>Debriefing Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
</table>
| I noticed you *(were quick/took a while)* to support airway and breathing when your patient stopped breathing. This was *(great/could harm your patient)* since most sick kids have limited oxygen reserves.  
  - What were focusing on?  
  - What helped/hindered you? | PALS provider manual  
  - Basic Life Support  
    - Assess ABCs  
    - Provide 100% oxygen  
    - Initiate CPR while awaiting set-up of defibrillator  
    - Bag mask ventilate with appropriate positioning, equipment and pressure | |

### Identifying Abnormal Cardiac Rhythms and Assessing Pulses

<table>
<thead>
<tr>
<th>Debriefing Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
</table>
| I noticed you *(were quick/took a while)* to identify the change in rhythm.  
  **OR**  
  I noticed you identified the rhythm as _______. The rhythm was intended to be ventricular fibrillation. Rhythm identification is critical for determining the treatment algorithm.  
  - How did your team decide on the rhythm?  
  - What helped/hindered you? | Ventricular Fibrillation  
  - Show examples of all rhythms considered | |
# 9. Skill Training

## Performing Good Quality CPR

<table>
<thead>
<tr>
<th>Debrief Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
</table>
| I noticed that you *(were quick/ took a while)* to start CPR. **OR** I noticed that there were *(few/many)* interruptions in CPR.  
* How did you coordinate CPR?  
* What helped/hindered you? | Review good quality CPR  
* Proper positioning of patient  
* Initiate CPR while awaiting set-up of defibrillator  
* Chest compressions with appropriate positioning, depth and rate  
* Minimize interruptions | |

## Defibrillation

<table>
<thead>
<tr>
<th>Debrief Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
</table>
| I noticed you *(were quick/took a little while to)* defibrillate the patient.  
* How did you decide whether or not defibrillate?  
* What helped/hindered you? | Defibrillation  
* Review indications for defibrillation  
* For children < 10kg, use pediatric paddles or pediatric-size defibrillation pads  
* Improve conduction with defibrillation gel pads or electrode cream  
* Appropriate positioning | |

## Recognizing ventricular fibrillation

<table>
<thead>
<tr>
<th>Debrief Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
</table>
| This patient was in ventricular fibrillation. I *(heard/didn’t hear)* that stated out loud. Stating the rhythm out loud helps everyone to verify the rhythm.  
* What rhythm did you think the patient had? Why?  
* What could you do if you weren’t sure of the rhythm? | Ventricular fibrillation  
* Wide-complex tachycardia but with irregular amplitude and periodicity  
* Pulseless | |
### 9. Skill Training

**Managing ventricular fibrillation**

<table>
<thead>
<tr>
<th>Debrief Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I noticed you <em>(did/did not)</em> follow the PALS algorithm for pulseless arrest (ventricular fibrillation) in this patient. The algorithm is designed based on the latest science to help kids recover quickly.</td>
<td>1. Begin CPR</td>
<td></td>
</tr>
<tr>
<td>• What was going on?</td>
<td>2. Initial defibrillation at 2-4 Joules/kg</td>
<td></td>
</tr>
<tr>
<td>• How did you decide on interventions/treatment priorities?</td>
<td>a. Charge defibrillator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Clear team members</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Resume CPR for 5 cycles, ~ 1-2 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Reassess rhythm, proceed with algorithm if indicated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Second defibrillation at 4-10 Joules/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Give appropriate dose of epinephrine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Epinephrine 1:10,000 0.01 mg/kg (0.1 mL/kg) IV/IO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Epinephrine 1:1,000 0.1 mg/kg (0.1 mL/kg) ETT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Repeat 3-6 as indicated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Amiodarone 5mg/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Consider and treat contributing factors as indicated</td>
<td></td>
</tr>
</tbody>
</table>
9. Skill Training

Examples for debriefing different Teamwork Learning Objectives

<table>
<thead>
<tr>
<th>Roles and Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debriefer Script</strong></td>
</tr>
<tr>
<td>Let’s talk about how you functioned as a team.</td>
</tr>
<tr>
<td>It looked like you did/did not have a clear team leader and defined team roles. I think this is great/concerning because clear team roles can help a team function smoothly- improving how quickly interventions take place and reducing errors.</td>
</tr>
<tr>
<td>o What did you think about your roles?</td>
</tr>
<tr>
<td>o What worked well?</td>
</tr>
<tr>
<td>o What could have been better?</td>
</tr>
<tr>
<td>Team leader</td>
</tr>
<tr>
<td>▪ Clear direction, coordination, timely interventions</td>
</tr>
<tr>
<td>▪ Foot of patient</td>
</tr>
<tr>
<td>Airway/Procedure MD</td>
</tr>
<tr>
<td>▪ Manage airway/c-spine</td>
</tr>
<tr>
<td>▪ Head of patient</td>
</tr>
<tr>
<td>Survey MD</td>
</tr>
<tr>
<td>▪ Primary, Secondary survey, pulses with CPR, reassess</td>
</tr>
<tr>
<td>Nursing roles</td>
</tr>
<tr>
<td>▪ Medication Prep (draw-up meds)</td>
</tr>
<tr>
<td>▪ Medication Admin (give meds)</td>
</tr>
<tr>
<td>▪ Documenting (time keeper)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Brief and Huddle</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debriefer Script</strong></td>
</tr>
<tr>
<td>I noticed that your team (did/didn’t/took a while to) (brief prior to the patient’s arrival/huddle after the initial evaluation). I thought this was (great/could have helped you work better as a team).</td>
</tr>
<tr>
<td>What (helped/hindered) your team from (briefing/huddling)?</td>
</tr>
<tr>
<td>How did that impact your team?</td>
</tr>
<tr>
<td>What could your team have done differently?</td>
</tr>
<tr>
<td>How can you make sure that (does/doesn’t) happen again?</td>
</tr>
<tr>
<td><strong>Reference Material</strong></td>
</tr>
<tr>
<td>The goal of a brief/huddle is to create a shared mental model. Assure all team members know what the working diagnosis is, treatment priorities and next steps in care.</td>
</tr>
<tr>
<td>Everyone on the team is responsible for making this happen. Anyone can ask for a brief/huddle. Brief/huddle is usually led by team leader.</td>
</tr>
<tr>
<td>If one team member doesn’t know what’s up or what’s next-s/he is probably not alone.</td>
</tr>
<tr>
<td><strong>Instructor Notes</strong></td>
</tr>
</tbody>
</table>
9. Skill Training

### Directed call out

<table>
<thead>
<tr>
<th>Directed call out Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I noticed that you (did/didn’t/intermittently) used (peoples names/roles/eye contact) when (calling out orders/asking for assistance). I thought this was (great/could have been more directed).</td>
<td>Directed call out. A tactical communication skill to assure that important orders/questions are specifically directed to one individual (rather than called out into the air).</td>
<td></td>
</tr>
<tr>
<td>• What did you notice about orders/questions that were asked?</td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>• How did this impact your team?</td>
<td>▪ “Jennifer-What’s the circulatory status?”</td>
<td></td>
</tr>
<tr>
<td>• What would you</td>
<td>▪ “Kim- Start CPR”</td>
<td></td>
</tr>
<tr>
<td>Directed call out.</td>
<td>▪ “Team leader- there’s no pulse”</td>
<td></td>
</tr>
</tbody>
</table>

### Closed loop communication/Check back

<table>
<thead>
<tr>
<th>Closed loop communication/Check back Script</th>
<th>Reference Material</th>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I noticed that you used closed-loop communication (consistently/ a lot/rarely). Closed-loop communication can be critical for catching errors and assuring that (information/an order/a request) is heard.</td>
<td>Closed loop communication/check back is a strategy that requires verification of information. This enables the sender of the message to verify it has been heard, and heard correctly. It enables the receiver to confirm what they heard is correct.</td>
<td></td>
</tr>
<tr>
<td>• What did you think about your communication loops?</td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>• How did that impact your team?</td>
<td>▪ Team leader “defibrillate 16 Joules”</td>
<td></td>
</tr>
<tr>
<td>• Has anyone seen problems with this in a patient resuscitation?</td>
<td>▪ Medication preparation nurse “defibrillate 16 Joules”</td>
<td></td>
</tr>
<tr>
<td>• Has anyone seen closed loop communication prevent an error?</td>
<td>▪ Team leader “correct”</td>
<td></td>
</tr>
<tr>
<td>• How could you do it differently next time?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. Equipment Setup

Simulation Environment preparation

Before each simulation, ensure the anticipated resuscitation equipment is available for the team’s use.

Resources

- PALS reference cards, material
- Patient Weight Estimator
- Pediatric Resuscitation Medication references (e.g.: Broselow tape, reference cards)
- Documentation forms

Universal Precautions

- Staff gowns
- Gloves
- Mask and face shields

Medications (consider having all or only a limited number of medications available)

- Adenosine
- Amiodarone
- Atropine
- Etomidate
- Fentanyl
- Ketamine
- Lidocaine
- Midazolam
- Normal Saline/Lactated Ringers
- Rocuronium
- Succinylcholine
- Epinephrine 1:10,000
- Epinephrine 1:1,000

Equipment

- Simulator in hospital gown, on bed
- Monitor – NIBP, HR, RR, Oxygen saturation, temperature
- Blood Pressure cuff, Heart Rate monitor leads, Oxygen saturation probe, defibrillator cables
- Oxygen hook-up on wall or cylinder
- Bag-mask system, multiple size masks
- O2 Mask, simple and/or non-rebreather
- Suction
- Thermometer
- Temperature probe
- Nasal, oral airways, multiple sizes
- Shoulder roll
- Endotracheal tubes- 3.0, 3.5, 4.0, 4.5, 5.0, cuffed or uncuffed, stylets
10. Equipment Setup

Equipment Cont’d

- Laryngoscope, Miller and Mac blades, multiple sizes
- End-tidal CO2 colorimeter
- Nasogastric tube(s)
- Stethoscopes
- IV/Angiocaths, various sizes
- IO needles, 2 sizes
- Gauze, Tape
- IV tubing
- IV pumps, pressure bags
- Syringes, multiple sizes
- Bedside blood sample processors: glucose, electrolytes, gases
- Specimen tubes
- Crash cart & backboard
- Defibrillator / AED
11. Assessment Methods

Type(s) of Assessment Methods Used in This Scenario:

- [ ] Pre-test Only
- [ ] Pre-test & Post-test
- [ ] Post-test Only
- [x] Medical Management Evaluation/Debriefing Form *(Appendix E)*
- [x] Teamwork and Communication Evaluation/Debriefing Form *(Appendix F)*
- [x] Simulation Session Evaluation *(Appendix G)*
## 12. Appendices

<table>
<thead>
<tr>
<th>Appendix A</th>
<th>Pediatric Ventricular Fibrillation Scenario Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix B</td>
<td>Teamwork and Communication (TeamSTEPPS) References</td>
</tr>
<tr>
<td>Appendix C</td>
<td>Debriefing Overview</td>
</tr>
<tr>
<td>Appendix D</td>
<td>Learner Handouts</td>
</tr>
<tr>
<td>Appendix E</td>
<td>Pediatric Ventricular Fibrillation Medical Management Evaluation/Debriefing Form</td>
</tr>
<tr>
<td>Appendix F</td>
<td>Pediatric Ventricular Fibrillation Teamwork and Communication Evaluation/Debriefing Form</td>
</tr>
<tr>
<td>Appendix G</td>
<td>Pediatric Ventricular Fibrillation Simulation Session Evaluation Form</td>
</tr>
<tr>
<td>Appendix H</td>
<td>References</td>
</tr>
</tbody>
</table>
Appendix A: Scenario Algorithm

**SCENARIO TIMELINE**

**Prelude:**
- Start Timer: 0-3 min.
- Scenario intro and team brief

**Act 1: Initial Assessment**
- 3-5 min.
- Triggers: Start 3 min into scenario
- End: 5 min into scenario

**Act 2: Ventricular Fibrillation**
- 5-13 min.
- Triggers: Start 5 min into scenario
- End: After 3rd defibrillation or 13 min into scenario

**Act 3: Resolution**
- 13-15 min.
- Triggers: Start after 3rd defibrillation or 13 min into scenario
- End: 15 min into scenario

**VITAL SIGNS**

- **Act 1: Initial Assessment**
  - Rhythm: sinus
  - HR: 96 bpm
  - BP: 0/0
  - SAT: 98%
  - RR: 36/min
  - Temp: 38.3°C

- **Act 2: Ventricular Fibrillation**
  - Rhythm: ventricular fibrillation
  - HR: 96 bpm
  - BP: not reading
  - SAT: not reading
  - RR: none
  - Temp: 38.3°C

- **Act 3: Resolution**
  - Rhythm: sinus tachycardia
  - HR: 126 bpm
  - BP: 82/44
  - SAT: 100% BVM
  - RR: BMV
  - Temp: 38.3°C

**FACILITATOR INFORMATION**

- Allow team to brief outside the simulation room
- No stridor, crying softly
- Loud systolic murmur present
- CR 3 sec
- If requested, labs are "pending"

- Pt. unresponsive with no respiratory effort
- No palpable pulse
- 1st Defibrillation: Remains in Vfib
- 2nd Defibrillation: Remains in Vfib
- 3rd Defibrillation: Resumes Sinus Tachycardia

- Sinus tachycardic with peaked T-waves
- No stridor
- Pt. still apneic
- CR 4 sec
- Additional exam info available if requested.
## Appendix B: TeamSTEPPS References

### Teamwork and Communication (TeamSTEPPS) Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptability</td>
<td>The ability to adjust strategies and altering a course of action in response to changing conditions (internal and external).</td>
</tr>
<tr>
<td>Brief</td>
<td>Discussion prior to start that assigns essential roles, establishes expectation, anticipated outcomes and likely contingencies.</td>
</tr>
<tr>
<td>Call-Out</td>
<td>A tactic used to communicate critical information during an emergent event. Helps the team prepare for vital next steps in patient care. (Example: “Airway status?” – “Airway clear”; “Breath sounds?” – “Breath sounds decreased on right”)</td>
</tr>
<tr>
<td>Check-Back</td>
<td>A communication strategy that requires a verification of information. The sender initiates the message; the receiver accepts it and restates the message. In return, the sender verifies that the re-statement of the original message is correct or amends if not. (Example: “Give Benadryl 25 mg IV push” – “Benadryl 25 mg IV push” – “That’s correct”)</td>
</tr>
<tr>
<td>CUS</td>
<td>Signal phrases that denote “I am Concerned, I am Uncomfortable, This is a Safety Issue.” When spoken, all team members will understand clearly not only the issue but the magnitude of the issue.</td>
</tr>
<tr>
<td>Debrief</td>
<td>Brief, informal information exchange session designed to improve team performance and effectiveness.</td>
</tr>
<tr>
<td>DESC Script</td>
<td>A technique for managing and resolving conflict. Describe the specific situation or behavior; provide concrete data. Express how the situation makes you feel/what your concerns are. Suggest other alternatives and seek agreement. Consequences should be stated in terms of impact on established team goals; strive for consensus.</td>
</tr>
<tr>
<td>Huddle</td>
<td>Ad hoc planning to re-establish Situation Awareness; designed to reinforce plans already in place and assess the need to adjust the plan.</td>
</tr>
<tr>
<td>SBAR</td>
<td>A framework for team members to structure information when communicating to one another. $S =$ Situation (What is going on with the patient?) $B =$ Background (What is the clinical background or context?) $A =$ Assessment (What do I think the problem is?) $R =$ Recommendation (What would I do to correct it?)</td>
</tr>
<tr>
<td>Shared Mental Model</td>
<td>An organizing knowledge structure of relevant facts and relationships about a task or situation that are commonly held by team members</td>
</tr>
<tr>
<td>Situation Awareness</td>
<td>The ability to identify, process, and comprehend the critical elements of information about what is happening to the team with regards to the mission. It’s knowing “What is going around you” and “What is likely to happen next”.</td>
</tr>
<tr>
<td>Situation Monitoring</td>
<td>The process of actively scanning and assessing elements of the situation to gain information or maintain an accurate awareness or understanding of the situation in which the team functions.</td>
</tr>
<tr>
<td>Two-Challenge Rule</td>
<td>Assertively voicing concern at least two times to ensure it has been heard.</td>
</tr>
</tbody>
</table>

Ventricular Fibrillation
Appendix C: Debriefing Overview

Simulation creates the opportunity to brief.
We believe that the focus of each simulation should be the DEBRIEF.
Simulation creates the opportunity to examine our medical management, technical skills and teamwork and communication skills. It facilitates discussion about challenges in a safe environment in order to improve the quality of patient care.

Framework for debriefing:
Each debrief should consist of 4 components:
- Introduction
- Discussion of emotions
- Discussion of medical management and technical skills
- Discussion of teamwork and communication skills

1) Introduction
This “sets the stage” for debriefing and creates expectations.

What you might say:
- This is an opportunity to reflect and learn, improve our medical care, team work, and communication.
- Everyone should be able to ask questions and share their thoughts.
- Once you leave this session, we encourage open discussion of the concepts, but ask you to not to discuss individual performance.

2) Emotional experience discussion
There are a couple of camps regarding discussing emotions. One perspective is that until emotions are dealt with, it’s difficult for adult learners to “move on”: switching gears to process thoughts, actions and opportunities for improvement\(^{12}\). Another perspective is that adult learners should process their emotions independently\(^{13}\).

Our perspective is the first. If a group or team member is emotionally charged (sad, mad or frustrated) regarding something that did or didn’t happen in a scenario, it’s usually difficult for the individual or the group to be actively engaged, receptive to feedback and able to promote learning, until the emotions are addressed\(^{12}\).

An example: a medication error occurs. One team member may think it is all his/her fault. S/he may feel embarrassed, judged, etc. If he/she can verbalize this, other team members may offer different perspectives, which enable the team to process the error together, potentially identifying contributing systems issues. If the emotions aren’t addressed- 3 separate people may feel embarrassed, responsible and not engage in a discussion, failing to identify systems issues which led to the error.

What you might say:
- How did that feel?
- Can you tell me more? Why?
Appendix C: Debriefing Overview

3) **Medical management and technical skills**
   This portion of the discussion focuses on the medical aspects of the scenario. It’s usually more comfortable to begin with these “facts”.

   What you might say:
   - Let’s begin by discussing medical management.
   - What did you think was wrong with the patient? Can someone briefly summarize what happened in this scenario?
   - How did you reach those conclusions?

4) **Teamwork and communication** (a. k. a. crew resource management, non-technical skills, human factors)
   This portion of the discussion focuses on how the team worked together. It can be emotionally charged and difficult to discuss without feeling personal. The challenge is to try to generalize specifics into themes.

   What you might say:
   - Let’s talk about how you functioned as a team.
   - What did your team do well?
   - What could your team do differently next time?
   - That is something I see often. Has anyone else experienced that? How have you seen that handled?

4) **Summarizing**
   - *This is your opportunity to ensure the key learning points are highlighted*
   - *Try to identify approximately three take-home points*
   - *You may ask the participants’ to identify take home points or call them out yourself.*

   **Medical management/technical skills examples:**
   (a) This was a scenario of pediatric ventricular fibrillation.
   (b) Signs of ventricular fibrillation: wide complex tachycardia with irregular amplitude, no p-waves, pulseless.
   (c) Treatment of ventricular fibrillation: CPR, shock 2-4 J/kg, CPR, subsequent shocks 4-10 J/kg, epinephrine every 3-5 min, etc, according to the PALS algorithm.

   **Teamwork/communication examples:**
   (d) Recognize need for a full resuscitation team when a patient develops ventricular fibrillation.
   (e) Designate leadership and team member roles to ensure coordinated team functioning.
   (f) Use *brief or huddle* to create a shared mental model for the working diagnosis and treatment plan.
Appendix C: Debriefing Overview

General Debriefing Goals\textsuperscript{12,13}:
\begin{itemize}
  \item Try to facilitate the TEAM’s discussion (avoid dominating the conversation)
  \item Ask open ended questions (avoid yes/no questions)
  \item Discuss the team performance (not the individual)
\end{itemize}
Ventricular Fibrillation Learning Objectives

1. Recognize ventricular fibrillation
   a. Disorganized electrical rhythm- no P-waves, no QRS complex
   b. Pulseless, no blood pressure
   c. Apneic
   d. Unresponsive

2. Treat ventricular fibrillation (see PALS- this sequence based on 2010 recommendations)
   a. Start CPR, apply oxygen, monitors
   b. Defibrillate 2 Joules/kg
   c. Resume CPR ~ 2 min/ 5 cycles
   d. If still in shockable rhythm, defibrillate 4-10 Joules/kg
   e. Resume CPR ~ 2 min/ 5 cycles
   f. If still in shockable rhythm after second defibrillation:
      i. Epinephrine 1:10,000
         • 0.01 mg/kg IV/IO every 3-5 min OR
      ii. Epinephrine 1:1,000
         • 0.1 mg/kg via ETT
   g. Repeat steps d-f
   h. If still in shockable rhythm after third defibrillation:
      i. Amiodarone 5 mg/kg IV bolus, may repeat up to 2 times
      ii. Continue repeating steps d-g

3. Performing high quality CPR
   a. Push hard (~ 1/3 of chest depth or ~2 inches)
   b. Push fast (goal ~100 compressions/minute)
   c. Allow for full chest recoil
   d. Minimize interruptions (for pulse checks, ventilations, defibrillation, rotating providers)
   e. Rotate compression providers every 2 minutes

4. Defibrillator/AED Skills
   a. Learn how to work your machine!
      i. Power button, mode selection, dose selection, synchronized vs. unsynchronized, charging, shock delivery
      ii. Pads and paddles (know how to switch them out)
      iii. Children < 10 kg= pediatric pads/paddles
      iv. Children ≥ 10 kg= full size pads/paddles
      v. Conduction gel/pads = works better
     vi. Safety issues: clear staff, oxygen, PLUS don’t use alcohol or water for conduction
### Appendix E: Medical Management Evaluation/Debriefing Form

**Pediatric Ventricular Fibrillation**  
**Medical Management/Technical Skills**

This checklist identifies core medical management/technical skills. It’s hard to discuss more than 3 of these during one debriefing session. We recommend focusing on 2-3 of these issues.

<table>
<thead>
<tr>
<th>Assessment of ABCDE’s</th>
<th>□ Done Well</th>
<th>□ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What did you think of the assessment of the ABCDE’s? What could you do differently?

<table>
<thead>
<tr>
<th>Recognizing ventricular fibrillation</th>
<th>□ Done Well</th>
<th>□ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discuss Points: What are the signs of ventricular fibrillation? - disorganized rhythm, pulselessness, apnea, unresponsive

<table>
<thead>
<tr>
<th>Managing ventricular fibrillation</th>
<th>□ Done Well</th>
<th>□ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discuss Points: What’s the treatment for ventricular fibrillation? CPR, defibrillation 2 J/kg, CPR, defibrillation 4-10 J/kg then repeat CPR, defibrillation 4-10 J/kg every 2 min. After second defibrillation, add epinephrine every 3-5 min. After 3rd defibrillation add amiodarone, may repeat up to twice.

<table>
<thead>
<tr>
<th>Effective CPR</th>
<th>□ Done Well</th>
<th>□ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discuss points: push hard, push fast, allow for full recoil, minimize interruptions, change providers every 2 minutes
Appendix F: Teamwork and Communication Evaluation/Debriefing Form

Pediatric Ventricular Fibrillation
Teamwork and Communication Evaluation

This checklist identifies core teamwork and communication skills. It’s hard to discuss more than 3 of these during one debriefing session. We recommend focusing on 2-4 of these issues.

<table>
<thead>
<tr>
<th>Leader/Roles Identified &amp; Maintained</th>
<th>□ Done Well  □ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Discussion Points: What helped/hindered having clear leadership and roles?*

<table>
<thead>
<tr>
<th>Directed Call out</th>
<th>□ Done Well  □ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Discussion Points: How were orders given - "Into the air" or directed at specific individuals? What did that impact you? How could they be delivered more effectively?*

<table>
<thead>
<tr>
<th>Check back/Closed loop communication</th>
<th>□ Done Well  □ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Discussion Points: describe closed loop communication*

<table>
<thead>
<tr>
<th>Shared Mental Model</th>
<th>□ Done Well  □ Needs Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific comments:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Discussion Points: How did team members share information/working diagnosis/treatment plan ((brief/huddle))?*
## Appendix G: Simulation Evaluation Form

### Simulation Session Evaluation Form

**Instructor:** ____________________________  **Date:** _____________

**Case Presented:** Pediatric Ventricular Fibrillation

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This simulation case provided is relevant to my work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. The simulation case was realistic.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. This simulation case was effective in teaching basic resuscitation skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. This simulation case was effective in teaching pediatric ventricular fibrillation management skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. The debrief created a safe environment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. The debrief promoted reflection and team discussion.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Can you list/describe 1 or more ways this simulation session will change how you do your job?

How could we improve this scenario?

Comments:
Appendix H: References


