Compensated Shock Due to Dehydration

# Curricular Information

**Target group**: Healthcare providers working in Emergency Department **Number of Participants**: 3-4 participants including a parent role **Simulation time**: 15 minutes **Debriefing time**: 30 minutes

## Learning objectives

* Identifies respiratory distress
* Identifies compensated shock
* Summarizes signs and symptoms of hypovolemic shock
* Performs correct treatment for hypovolemic shock due to dehydration

## Scenario progression

A 9-month-old baby girl presents in the emergency room with respiratory distress and dehydration due to diarrhea and lack of fluid intake. She has tachycardia with a heart rate at 162/min with increased, shallow respirations at 39/min. She is pale and drowsy with cold and mottled skin. She reacts irritable to physical stimuli but does not react to voice. She does not cry, and her movement is decreased. Her blood pressure is 68/54 mm Hg, Spo2 is 97%, and delayed capillary refill time is 6 seconds.

The participants are expected to recognize the onset of compensated, hypovolemic shock due to dehydration. They should support oxygen saturation with oxygen administration and restore fluid balance with 2 fluid boluses. This will stabilize the baby. The participants should order further lab studies and consider treatment with antibiotics, communicate the condition to the baby’s parents, and keep her for observation.

## Debriefing

When the simulation is over, it is recommended that a facilitator-led debriefing be completed to discuss topics related to the learning objectives. The Event Log in Session Viewer provides suggested debriefing questions. Central discussion points could be:

* Signs and symptoms of hypovolemic shock
* Differences on compensated and hypotensive shock due to dehydration
* Treatment of hypovolemic shock

## References

Ian K. Maconochie, Allan R. de Caen, Richard Aickin, Dianne L. Atkins, Dominique Biarent, Anne-Marie Guerguerian, Monica E. Kleinman, David A. Kloeck, Peter A. Meaney, Vinay M. Nadkarni, Kee-Chong Ng, Gabrielle Nuthall, Ameila G. Reis, Naoki Shimizu, James Tibballs, Remigio Veliz Pintos, on behalf of the Pediatric Basic Life Support and Pediatric Advanced Life Support Chapter Collaborators: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations Part 6: Pediatric basic life support and pediatric advanced life support, in *Resuscitation*, 95 (2015) e147–e168, at <http://dx.doi.org/10.1016/j.resuscitation.2015.07.044>

# Setup and preparation

## Equipment

**Medical supplies**

* Advanced airway equipment
* Airway adjuncts (oropharyngeal airways, nasopharyngeal airways)
* Bag-mask device
* Blood pressure cuff
* Color-coded length-based resuscitation tape
* Contact precautions equipment such as gowns, gloves, masks, and goggles
* Continuous waveform capnography
* Crib (prehospital) or bassinet (emergency department/in-hospital)
* Defibrillation pads\*
* Defibrillator/automated external defibrillator (AED)
* ECG electrode cables
* General medication administration supplies
* Glucometer
* Infusion pump and tubing
* IV/IO start supplies
* Oxygen delivery devices
* Oxygen supply source
* Pulse oximeter probe
* Respiratory nebulizer
* Stethoscope
* Suction device, tubing, catheter (tonsil tip), and canister
* Thermometer
* Universal precautions equipment
* Ventilator

**Medications and fluids**

* Albuterol
* Antibiotics
* Antihistamine
* Corticosteroids
* Dobutamine
* Dopamine
* Epinephrine
* Lactated Ringer’s
* Nitroglycerin
* Norepinephrine
* Normal saline
* Rapid sequence intubation medications

**Props:**

* Clothes and diaper appropriate for infant
* Patient ID band

## Preparation before simulation

* Set up the room to look as a normal emergency room with all equipment ready and a patient monitor connected to LLEAP or SimPad
* Dress the simulator in clothes and a dry diaper, and attach a patient ID band around the wrist
* Place the simulator in the arms of the parent.

## Information for Learner Brief

*The learner brief should be read out loud to the learners before the simulation starts.*

Emergency Room, 17:00

A 9-month-old baby girl is brought in by her parent. She started vomiting yesterday and stopped taking her bottle. Since then she has developed diarrhea. Her parents got worried as she seemed hard to wake and very drowsy after 2 hours of sleep this afternoon. Please go and see the patient.

Before the simulation starts, please orient yourself to the simulation room and the available equipment.

# Customization of the Scenario

The scenario may form the basis for creating new scenarios with other or additional learning objectives. Making changes to an existing scenario requires careful consideration of what interventions you expect the learners to demonstrate, and what changes you will need to make to learning objectives, progression of scenario, programming and support material. It is, however, a quick way to increase your pool of scenarios because you can reuse much of the patient information and several elements in the scenario programming and support material.

For inspiration, here are some suggestions to how this scenario can be customized:

|  |  |
| --- | --- |
| **New learning objectives** | **Changes to the scenario** |
|  |  |
| Include learning objectives on team training | This scenario could also focus on team dynamics and communication. Remember to add your additional events in the programming for logging team-related actions. |
| Include learning objectives on treatment of bleeding | The cause of the hypovolemic shock could be changed to severe external or internal bleeding which will require multiple fluid boluses and the need for a blood transfusion. Remember to change programming, scenario progression and Learner Brief accordingly. |
| Include learning objectives on treatment of burns | The cause of the hypovolemic shock could be changed to a major burn which requires consideration of albumin and other colloids, and additional treatment of the burn site. Remember to change programming, scenario progression and Learner Brief accordingly. |