



School of Health and Life Sciences

Simulation Centre

Peds ER: Cardiac Emergency

Revised Date: August 2022

RESP 3590

Public Scenario Title

Peds ER: Cardiac Emergency

Scenario Description

An 8 month old patient with a history of hypoplastic left heart and a previous Sano and Glenn shunt procedure is being brought into ER by EMS. The patient is having blue spells and increased work of breathing.

Scenario Objectives

1. Rapid management of decompensated cardiac patient in ER
2. Rapid patient assessment
3. Initiation and Optimization of appropriate Oxygen Therapy
4. Utilize optimization techniques considering PVR when managing cardiac patients

Equipment, Supplies, and Resources

Program	Simulation Center
Pediatric sim cart 3 - pediatric	Laerdal SimBaby on a stretcher
Airvo or HHF	Double O2 flowmeter
	Suction regulator x 2 with connecting tubing
Sim kits to add to cart:	Towels for supports
Peds HHF kit	Yankauer suction
	Extra computer to display in theatre
	Confederate Mic
	Cart for mannequin monitor
	Extra computer in control room to play crying baby and software "mouse mover" to prevent monitor from going to sleep

Pre Scenario Information

All Student Participants

Please ensure that students are orientated to the room, mannequin and equipment they are utilizing during the simulation. There is 1.25 hours allotted for the scenario and debrief. More detailed resources and all associated protocols can be found in resources folder for scenario. Run scenario multiple times allowing for all students to get hands on with different roles in the procedure.

Participant(s) in the Hot Seat

You are working in ER. An 10 month old baby who has a history of hypoplastic left ventricle has recently been discharged home after next stage of their repair, a Bidirectional Glenn shunt. You are working in ER and are told EMS is 5 minutes out.

This scenario is happening as a piece of what happens during an admission to ER. Normally there would be a Physician and a/multiple nurse(s), and possibly additional RT's at the bedside to receive the patient. This scenario focuses on your role as an RT receiving patient hand over from EMS, rapid assessment and optimizing initial treatment.

EMS report at handover is as follows:

"They were at home, progressively worsening over last 4 days likely with an URTI that has progressed into a full blown chest infection. Cough has been unproductive, he's been fevered on and off and his sats have been slowly declining in same time frame. This morning Mom woke to find him very blue and though responsive, lethargic. He was coughing a lot and couldn't catch his breath. She called EMS right away. Despite a NRBW, we can't seem to get his sats above 70. He has ++ accessory muscle usage and indrawing throughout."

Student 2 – Assistant (ER2 RT)

You will be playing the role of the ER2 RT, who provides backup coverage to the ER RT. You can be called in for backup as needed by Student 1. (This mimics the way that Stollery ER actually works! (One therapist is assigned to cover ER and there is a second therapist, ER2, that will respond as needed for backup)

Scenario Flow

Run scenario multiple times to allow maximal student participation

Mannequin laying on stretcher. NRMB 8 lpm, covered with sheet. **Play Audio File as necessary to simulate baby crying**

1 Student enters room to receive patient. Brief history as provided by EMS.

Verbalized by EMS - ++accessory muscle usage and indrawing throughout

Student should perform rapid assessment. Can call for help from ER2 at any time

Optimize:

to decrease PVR and encourage blood flow →

- positioning in HF
 - calming patient
 - supporting wob and sats with therapy
- (Student should not provide PPV as that would decrease BF by increasing PVR – if they do make pt sats worse.)

Mannequin:

RR: 45-50

SpO₂ 68

HR 140

BP 68/38

Chest: coarse crackles, decreased A/E

2nd
scene

After assessment students should consider initiating HHF...

- if they first increase flow to PRBM, no change in sat
- should ask for pt weight (~6 kg), start flow at 2L/kg
- Fio₂ >60% targeting WOB and sats
- cannula 50% of nare

If not already done

- optimize patient position (increase HOB, at least semi fowler)

Patient vitals should change when approached/ touched

- crying, agitated

Mannequin:

RR: 45-50

SpO₂ decr ~61-65

HR incr to ~160-170s

BP decr ~60/~34

Variant
3rd Scene

3rd
scene

Vitals should improve once HHF set up and students back away.

Mannequin:

RR:40s

SpO₂ 71-74

HR 140

BP ~68/34-38

WOB slightly improved (if they ask)

Can decompensate again with handling or if HOB **not** raised (leave SpO₂ in mid 60s)

3 -Students should recognize SpO₂ is still low,

- Look to consult for help and get patient transferred to PICU for possible intubation, cardiac investigations, and management.

-think about other ways to decrease PVR (nitric, other meds, calming patient – step away and observe? Parent presence?)

3b – Variant
Patient has poor compliance and is wheezy on admission.
Students should trouble shoot and optimize with inhaled meds

Other variant – change patient to different cardiac defects to allow for larger exposure to both cyanotic and acyanotic defects

Debriefing Information

"Debriefing should reflect back on the pre-determined objectives, but may also move in unexpected directions"

Objective	Demonstrated Skills and Knowledge to achieve Objectives
Rapid management of decompensated cardiac patient in ER	<ul style="list-style-type: none"> • Receive history <ul style="list-style-type: none"> ○ Very brief pointed history ○ Support ABC's as necessary
Rapid patient assessment	<ul style="list-style-type: none"> • Perform Rapid PALS assessment <ul style="list-style-type: none"> ○ LOC – both before touching and on exam ○ Airway patency <ul style="list-style-type: none"> ▪ Are they able to maintain their airway, open clear, do I need an intervention ○ Breathing <ul style="list-style-type: none"> ▪ RR ↓↑, mechanics like grunting, retractions, accessory muscles, A/E, chest expansion, stridor, wheezing, abnormal breath sounds ○ Take care of breathing <ul style="list-style-type: none"> ▪ What interventions are appropriate <ul style="list-style-type: none"> • What are your target sats with this CHD • HHF and why (support WOB and FiO2) • PPV why not (will ↑ PVR, worsen SpO2) • Other – focused on initial management and urgent interventions
Initiation and Optimization of appropriate Oxygen Therapy	<ul style="list-style-type: none"> • Initiate HHF <ul style="list-style-type: none"> ○ Initial settings <ul style="list-style-type: none"> ▪ Appropriate cannula and circuit sizing ▪ Flow 2L/Kg/Min (max) ▪ FiO2 >60% • Optimize Therapy <ul style="list-style-type: none"> ○ Pt position (SF minimally) ○ Calm patient ○ Medical management <ul style="list-style-type: none"> ▪ Drugs – <ul style="list-style-type: none"> • nitric • Inhaled bronchodilators? • what about IV meds? ○ Cardiac considerations
Utilize optimization techniques considering PVR when managing cardiac patients <i>(Discussion to take place in debrief after scenario, won't likely be able to see/have students speak to during sim)</i>	<ul style="list-style-type: none"> • Consideration of what comes next for this patient <ul style="list-style-type: none"> ○ Target sats ○ Possible appropriate therapy interventions ○ Diagnostic tests ○ When do you intubate these patients ○ What ventilation considerations are there with PVR • Specific considerations of any shunt (surgical or pathological) <ul style="list-style-type: none"> ○ RV → PA conduit ○ Glenn ○ Fontan ○ BT shunts (TOF or pulmonary valve dysfunctions)

Three Stage Debriefing Model

1. Reactions/Emotions

- Participants share their feelings and redeem their actions
- Facilitators can say (to allow for reactions from each participant), "*In one word, describe how that felt for you*", or "*How are you feeling right now?*"

2. Analysis/Exploration

- Facilitator systematically sets the stage for discussion topics – based on the scenario objectives, and any learning gaps that may have presented in the scenario
- Facilitators can say, "*Now I'd like to talk about (insert topic here).*"
- Facilitators can use a number of techniques to initiate responses from the participants, such as "Advocacy/Inquiry", "Appreciative Inquiry", "Self-reflection", etc.
- Aim is to for the facilitator to LISTEN; understand; and respect learners' perspectives. Once that is accomplished, the facilitator should "close" any performance/learning gaps.

3. Summary/Application

- Engages participants for future application of all learning points
- Facilitators can say, "*What is one 'take-away' from our discussion that you could apply the next time you encounter the same or a similar clinical situation?*"

Roles of the Facilitator throughout the Simulation Experience

- Respect for learner opinions and psychological safety
- Belief in integrity of learning through simulation
- Manages upset/monopolizing/outlier individuals