SAFETY

simulation for medical practice

SIMULATION APPROACH FOR EDUCATION AND TRAINING IN EMERGENCY

Cardiogenic Shock

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Summary

Scenario Description

Learning Target

Reach the diagnosis:
-Patient interrogation:

- Comorbidities: Cardiovascular risk factors.
- Symptoms:
  - Ask for chest pain.
  - Ask for Dyspnoea
  - Orthopnoea
  - Paroxysmal nocturnal dyspnoea
  - Oedema

-Physical examination:

- Alertness: Is the patient conscious?
- Respiratory: How is the patient breathing? Auscultation, Saturation.
- Circulatory state: measurement of blood pressure, checking cardiac rhythm, peripheral perfusion, oedemas.
- Systematic: ABCD is applied while starting support therapy.

-Tests:

- Thorax XR
- Point of care: Lactate, Venous Saturation
- ECG->NSTEMI
- Echocardiography: Left ventricular dysfunction.
- Ask for: Troponins, kidney function, ProBNP.

Description

Where:
- Emergency department
Patient:
-Patient with acute symptoms of cardiogenic shock due to myocardial infraction.

Frame conditions:
- it is possible to:
  - Monitor the patient.
  - Point of care, XR, ECG, and echocardiography are available
  - Ask for specialist opinion.

Participants

-Medical student 5th or 6th year or resident 1st year
-Nurse student 4th year
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Treatment:

-Support therapy

- A-B: Oxygen, consider plan if deterioration, NIMV.
- C: Arterial line, central line, dobutamine

-Directed therapy.

- Asking for specialist
- Going to cath lab for PCI
- ICU

Non-technical skills:

-Citate names

-Close the loop

-Share Mental Model

-SBAR:

- S: Situation
- B: Background
- A: Assessment
- R: Recommendations

Notes:

This scenario can be performed either by the whole team in different roles (Medical and nurse role) or one participant (medical or nurse role) and an actor.

Scenario Briefing

Briefing (everyone)

You are working in a hospital.

A 77-year-old female is brought to the emergency department with a complaint of asthenia and dizziness.
She has a past medical history of hypertension, Diabetes Mellitus, hyperlipaemia, obesity and tobacco smoking.

Medication: enalapril, metformin, atorvastatin.

Additional Briefing (individual positions)

Medical student or resident:

You are working in the emergency department, and you are the first health care professional in contact with the patient.

Assess the patient, try to find a diagnosis, and make a therapy decision.

You may enter the emergency room on your own or with another doctor or/and a nurse.

Inside the emergency room there is a nurse assistant to help you with the material you may need.

You will get help when you call for it.

Nurse student:

You are asked to take care of her. You will enter the room on your own or with another nurse or/and a doctor.

Inside the emergency room there is a nurse assistant to help you with the material you may need.

You will get help when you call for it.

Case Briefing (role-players)

Nurse assistant (confederate):
You are a nurse assistant in the emergency department. Depending on the country you are allowed to help facilitating material, medicines, setting the motoring up. You know the workplace perfectly. You will be in the room when the participant(s) arrive.

You can guide with questions (hidden hints).

If the hints are ignored, help with more direct comments: “Last time I saw that, the team did…” (only correct hints!).

Notes:
- This scenario briefing is for 1 or 2 students (two medical, medical and nurse, nurse, and nurse).
- If the only participant is a medical student, then, the nurse assistant will be replaced by an emergency nurse that will remain in the scenario from the beginning helping the student (confederate). Her duties would depend on the country the case is intended to be performed.

Script Sim Nurse/Co-Instructor

List of Material

Simulated Patient:
-Preference: Manikin and monitor with remote control.
-Other options: Actor with monitoring, basic manikin (task training manikin) with monitor. Please be aware of limitations for auscultation.
-MUST: Allow patient communication with learners
-TIPS: Patient dressing code according to age (ex. Glasses, wing)

Specific material: Apart from the standard emergency room motoring-material-equipment
-Point of care (with lactate and venous saturation)
-Abnormal chest XR with pulmonary oedema
-Abnormal ECG with NSTEMI
-Pre-recorded video with abnormal capillary refill time
-Simulated ultrasound probe and pre-recorded video with abnormal transthoracic echocardiography (left ventricular systolic dysfunction)
-Device to watch the pre-recorded videos.

Set-Up Room

- When the participants enter the room, the patient is lying in supine position. The confederate (nurse-nurse assistance) is already in the room.

- The patient:
  - Spontaneous ventilation in air room
  - Not monitored
  - Has not a peripheral intravenous line

- In the room:
  - Crash cart
  - Ultrasound machine
  - Cardiotocograph

Set-Up Simulator

When the scenario starts, the patient is not monitored, has neither an intravenous line nor oxygen.
The patient is conscious. Be aware that any problem or delay in the reply of the patient to the participants' questions may look like the patient is in worse condition than the planned.

Notes:
If there is not x-ray machine available, please consider sending participants out of the room while simulating the x-ray.

Scenario Saver

How to react if the medical problem is not identified	How to react if the medical problem is identified too quickly	Other comments, material needed for savers (e.g. white coat)
If the participant/s are not able to reach a diagnosis or if they reach a diagnosis but they don´t treat the patient accordingly, the confederate can give hints and guide the participant through all the steps for the resolution of the case. The patient will not die. The confederate can guide with questions (hidden hints): “What does …. mean?” “Is it also possible to do …?” If the hints are ignored, help is also possible with more direct comments: “Last time I saw that, the team did…” (only correct hints!) And finally, the confederate can fake a phone call to the consultant and say afterwards: “The consultant is coming. He told us to do…”	- A good performance should not be slowed down unnecessarily! - When the scenario is solved, regardless of the timing, the cardiologist (confederate) will enter the scenario and the participants will summarise the case. If something relevant is missing the confederates will point it out	-A radio connection between the team in the control room and the confederate should exist. -Two real mobile phones are highly recommended to call the cardiologist from the scenario.

Scenario End Criteria

Scenario ends when …	Timing	
All the following statements are true: ● The diagnosis of cardiogenic shock is reached. ● Supportive treatment is initiated. ● The option of coronary arteriography/ICP has been considered. These statements can be achieved by the participants on their own or with help of the scenario saver. Once the cardiologist enters the emergency room, the cardiologist would ask the participants to handover the patients. Then, the cardiologist would say, “OK, thank you very much for taking care of our patients, I will continue from now on”	The scenario is planned to last between 10-15 minutes. Instructors could help if the previous points have not been achieved within the stipulated time.	

Notes: Don’t let the patient die

Simulator Set-Up, Steering Step 1-Recognition of shock and initiation of support therapy

Vital Signs	**Text for Patient**	**Management during scenario**
Eyes blinking Airway clear Resp. Rate: 22/min Lungs: bilateral lung crackles SpO_2: 89% (98% with O_2) CO_2: 33 cm H_2O HR: 90/min, pulses weak Heart: mitral systolic murmur ECG: Sinus rhythm BP: 75/50 mmHg Temp: 36,0°C Glycaemia: 180mg/dl Video of capillary refill time->more than 2 seconds. If asked, the patient is cold. Initial situation - Patient is not monitored. - Patient is tachypnoeic on room air (be careful, the goal is not to induce participants to orotracheal intubation) - Patients is conscious and calm. However, she feels dizzy.	Patient is fully orientated and will answer to all questions correctly (name, age, medication) Optionally the next of kin can provide all the information (If an extra confederate is available) The patient has been feeling unwell for one day. She was gardening and out of the blue she became dizzy and progressively tired. If participants ask: • No Fever • No Chest Pain • No vomiting/diarrhoea • She is short of breath. • Last night she had to sleep with two pillows.	During anamnesis and ABCDE first survey patient will remain stable. Be aware that any problem or delay in the reply of the patient to the participants' questions may look like the patient is in worse condition than the planned. Monitoring and procedures are available on request (Oxygen, peripheral line, point of care). -Improvement of oxygenation would depend on the scenario director and the expertise level of participants. - Improvement of blood pressure if treated would depend on the scenario director and the expertise level of participants. The next of kin will leave the room if ask (if there was one). **Trigger** for next step is either completion of first ABCDE and diagnosis of shock (or time).

Simulator Set-Up, Steering Step 1-Recognition of the cause of shock and suggestion of specific treatment

Vital Signs	Text for Patient	Management during scenario
Eyes blinking Airway clear Resp. Rate: 22/min Lungs: bilateral lung crackles SpO_2: 89% (98% with O_2) CO_2: 33 cm H_2O HR: 90/min, pulses weak Heart: mitral systolic murmur ECG: Sinus rhythm BP: 75/50 mmHg Temp: 36,0°C Glycaemia: 180mg/dl Video of capillary refill time->more than 2 seconds. If asked, the patient is cold.	Patient is fully orientated and will answer to all questions correctly (name, age, medication) Optionally the next of kin can provide all the information (If an extra confederate is available) The patient is slower than previously. She says that she is still feeling unwell, dizzy and tired.	The patient will remain stable or depending on the performance of the team the scenario director may make the patient deteriorate (hypotensive). Remember, CPR is not a goal in this case. -Improvement of oxygenation would depend on the scenario director and the expertise level of participants. - Improvement of blood pressure if treated would depend on the scenario director and the expertise level of participants. Be aware that any problem or delay in the reply of the patient to the participants' questions may look like the patient is in worse condition than the planned. X-Ray, ECG and transthoracic echocardiography will be available. -Mobile phone to call the cardiologist or activate the caht lab would be available. -Furter inotropic and vasopresor support would be available. -Mask oxygen, high flow nasal cannula, Non-invasive mechanical ventilation would be available depending on resources and the scenario director.

		-If intra-aortic balloon pump (IABP) is requested, the confedered would say that it is on the way (IABP is not a goal of the scenario)

Abstract

Learning Target:	Recognition, diagnosis, and treatment of a patient with cardiogenic shok
Description:	- Signs and symptoms recognition (anamnesis and physical examination) - Basic monitoring - Supportive treatment - Definitive treatment is suggested
Participants:	Medical student 5th or 6th year or resident 1st year and/or Nurse student 4th year
Case Briefing:	A 77-year-old female is in the emergency room with cardiogenic shock.
List of Material:	- Emergency room basic monitoring, treatment, and lines. - Manikin with possibility of simulated voice -Point of care (with lactate and venous saturation) -Abnormal chest XR with pulmonary oedema -Abnormal ECG with NSTEMI -Pre-recorded video with abnormal capillary refill time -Simulated ultrasound probe and pre-recorded video with abnormal transthoracic echocardiography (left ventricular systolic dysfunction)

Set-Up Room	- Emergency room -Patient lying on bed, no monitored, without oxygens and lines -A confederate in the room (a nurse-nurse assistance). Next of kin (optional)
Set-Up Simulator:	Vital signs remote control. Initially, patient is not monitored. Once patient is monitored, she is hypotensive and desaturating
Scenario Saver:	Cardiologist (confederate)
Scenario End Criteria:	Achieving the diagnosis of cardiogenic shock with support therapy initiated and specific treatment suggested (by the participants or with help of confederates)
Management during Scenario:	From the control room. It is paramount to have a way to communicate with the confederate.
Other:	Limitations - Depending on the manikin could be: Eye blinking, sweat, pallor, cold skin