

SAFETY

simulation for medical practice

SIMULATION APPROACH FOR
EDUCATION AND TRAINING
IN EMERGENCY

Hipertension/Hypertensive crisis

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DOCUMENT VERSION 01

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Sim-Scenario

Hypertensive emergency

Hypertensive Encephalopathy

Scenario Description

Learning Target	Description	Participants
<p>Medical:</p> <ul style="list-style-type: none">-diagnose hypertensive encephalopathy based on the history, physical examination findings, lab studies and CT scan- consider other diagnostic tools such as fundoscopic exam, optic ultrasonography- acknowledge hypertensive encephalopathy as a medical emergency- optimize hemodynamics by using antihypertensives and fluid resuscitation if needed-search the cause of the hypertension <p>CRM:</p> <ul style="list-style-type: none">- understand the importance of communication- effective teamwork to deliver a quick diagnosis and decide the next best move in patient management	<p>Where:</p> <ul style="list-style-type: none">- high-dependency unit (HDU) <p>Frame conditions:</p> <p>Day shift, al ressources available</p>	<p>- 3-4 participants, 1-2 doctors and 1-2 nurses</p> <p>Wife as actor possible (she could report restlessness and confusion)</p>
<p>Notes:</p>		

Sim-Scenario

Hypertensive Encephalopathy

Scenario Briefing

Briefing (everyone)	Additional Briefing (individual Positions)	Case Briefing (Roleplayers)
<p>Silvio D is a 55-year-old male adult farmer who for the past 3 days had during the evenings headache and nausea. In the morning of his admission he has restlessness and confusion.</p> <p>Confused, restless, vomiting and dehydrated, he gets admitted to HDU.</p> <p>Initial clinical examination: sweaty, warm skin, BP 190/120 mmHg, AV 120/min equal pulses at upper and lower limbs</p> <p>A wait-and-see approach is endorsed encompassing lowering the BP and fluid resuscitation.</p>	<p>Patient voice: Initially slurry, but recalls history of headache and nausea</p>	<p>Nurse – informs on vomiting, confusion and agitation; Helps the doctor to evaluate the neurological state of the patient.</p> <p>Neurologist – in order to help confirming the severe neurological state</p> <p>Background info for Trainers: persistent or worsening hypertension may lead to neurological deterioration.</p> <p>Clinical, laboratory, CT scan and monitoring data are prepared to help diagnose the hypertensive emergency with organ dysfunction.</p>

Notes:

Sim-Scenario

Hypertensive Encephalopathy

Script Sim Nurse/Co-Instructor

List of Material	Set-Up Room	Set-Up Simulator
<ul style="list-style-type: none">- standard monitoring- i.v antihypertensives- arterial lines- intubation kit- fluids- pumps	<ul style="list-style-type: none">- high-dependency unit	<ul style="list-style-type: none">- SimMan 3G or TraumaHal Gaumard, dressed casually (farmer)

Notes:

Sim-Scenario

Hypertensive Encephalopathy

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 coats)
Neurologist (roleplayer) comes to assess the patient. Does a full body exam and asks to see the CT scan and the lab results.	Neurologist (roleplayer) should then discuss the arguments supporting hypertensive emergency/hypertensive encephalopathy diagnosis. However, do not unnecessarily delay a good team.	

Notes:

Sim-Scenario

Hypertensive Encephalopathy

Scenario End Criteria

Scenario ends when...	Expected actions during initial assessment and treatment:	Case story
<ul style="list-style-type: none">- Hypertensive encephalopathy is recognized- hemodynamics are optimized- patient is intubated	<ul style="list-style-type: none">- physical examination- full neurologic exam- check vital signs- check blood-gas- check CT scan- check biochemistry- may ask for fundoscopic exam- may ask for optic ultrasonography- iv antihypertensives in order to lower MAP 10-20% in the first hour and no more than 25% total in the ED- iv fluids- call neurological evaluation-if altered mental state, consider endotracheal intubation	<p>-responded well to initial management: intravenous antihypertensive Nicardipine (start infusion at 5 mg/h, increase by 2.5 mg/h q5min (max 15 mg/h), drop to 3 mg/h when desired BP obtained</p> <p>Initial CT scan excludes any intracranial event. Lab studies show initial mild metabolic acidosis, microscopic hematuria. After initial improvement, he worsens his neurological state, he becomes arresponsive to speech or pain.</p>

Notes: Don't let the patient die!
General note – end the scenario saying:
“The patient is now going to be taken care of, thank you for solving the case”

Sim-Scenario

Hypertensive Encephalopathy

Simulator Set-Up, Steering

	Phase 1 Initial and management phase	Phase 2 Worsening if no adequate measures
Vitals	HR: 120/min, sinus rhythm BP: 190/120 mmHg SpO2: 98% with 4l/O2 CO2: 24 mmHg Resp. Rate: 35/min Temp: 36.3 C	HR: 120/min, sinus rhythm BP: 210/140 mmHg SpO2: 90% with 6l/O2 CO2: 55 mmHg Resp. Rate: 10/min Temp: 36.3 C
Text for patient	-Patient has an initial slurry speech -Agitated (RASS +1, +2) - S.D. reports nausea and vomiting - with persisting hypertension he becomes arresponsive to speech and pain	Same as before
Other info	Critical actions: - iv antihypertensives in order to lower MAP 10-20% in the first hour and no more than 25% total in the ED - iv fluids - call neurological evaluation	Critical actions: -avoid centrally acting antihypertensives (clonidine, methyldopa or reserpine) to prevent CNS depression and clouding of mental state
Management during scenario		

Notes: First evaluation.
 Biochemistry outstanding: microscopic hematuria; all other values are within normal range.
 BGA: lactate of 2.5 mmol/L; CO2 of 24 mmHg; HCO3 of 17mEq/L; pH of 7.28.
 CT scan shows no signs of stroke, hemorrhage or intracranial mass.

Sim-Scenario

Hypertensive Encephalopathy

Abstract

Learning Target:	Management of hypertensive crisis
Description:	55 yr old patient with a history of headache and nausea, going in hypertensive encephalopathy

Participants:	3-4 participants, 1-2 doctors and 1-2 nurses
Case Briefing:	Silvio D is a 55-year-old male adult farmer who for the past 3 days had during the evenings headache and nausea. In the morning of his admission he has restlessness and confusion.
List of Material:	
Set-Up Room	High Dependency Unit
Set-Up Simulator:	dressed casually (farmer)
Scenario Saver:	Neurologist
Scenario End Criteria:	Recognition and treatment of hypertensive crisis
Management during Scenario:	
Other:	

Notes:
