

SCRIPT

OCCLUSION M1 SEGMENT OF THE LEFT
MCA



SCENARIO

#144

NAME

SILVIA RUTH

SPECIALTY

Neurology

DIFFICULTY LEVEL

ADVANCED

SIMULATION ENVIRONMENT

INTRA HOSPITAL - EMERGENCY ROOM

Scenario

General description of the scenario info. Corresponds to the initial information presented to the trainee when selecting this scenario.

Title

Occlusion M1 segment of the left MCA

Context

Mrs. Ruth was in a nursing home watching television when she suddenly felt drowsiness and right-sided weakness. Institution staff witnessed the event and immediately called the emergency team, who brought her to the hospital.

Briefing

84-year-old female, had a sudden onset of right-sided weakness, drowsiness, and difficulty speaking three hours ago.

General learning objective

Recognize acute stroke.

Identify accurately grade neurological deficits using NIHSS in acute stroke.

Specific learning objectives

NIHSS results

- 1a. Level of consciousness (LOC) - Responsiveness - 1
 - 1b. LOC - Questions (month and age) - 2
 - 1c. LOC - Verbal commands (open/close eyes, grip/release non-paretic hand) - 2
 - 2. Best gaze (only horizontal eye movements, voluntary or reflexive) - 2
 - 3. Visual fields (stimuli or threats in each eye's 4 quadrants) - 2
 - 4. Facial palsy - 2
 - 5a. Motor Right Arm (10" sitting at 90°, supine at 45°) - 4
 - 5b. Motor Left Arm (10" sitting at 90°, supine at 45°) - 0
 - 6a. Motor Right Leg (5" lying at 30°) - 4
 - 6b. Motor Left Leg (5" lying at 30°) - 0
 - 7. Limb ataxia (finger-nose-finger; heel-shin) - 0
 - 8. Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) - 2
 - 9. Best Language (name items, describe a picture, read sentences) - 3
 - 10. Dysarthria (clarity of articulation of speech when reading or repeating words) - 2
 - 11. Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosognosia) - 0
- Total result: 26

Pre-simulation notes

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Environment

Intra Hospital - Emergency Room

Specialty

Neurology

Difficulty Level

Advanced

Reviewers

Angels Initiative

Patient characteristics

Characterization of the patient's demographic, habits, behavior and specific status effects.

Avatar



Patient Name

Silvia Ruth

Age

84 years

Race/Ethnicity

European/Caucasian

Smoker

No

Sedated

No

Agitated

No

Facial palsy

100

Eyelid closure

0

Gender

Female

Eye color

Brown

Conscious

Yes

Confused

No

Last meal over 2h

No

Speech impairment

Yes

Renal metabolic compensation

Auto

Patient parameters

These parameter values are used by the simulator to initialize this scenario and correspond to a pre-treatment baseline.

Systolic arterial blood pressure (mmHg)

171

Diastolic arterial blood pressure (mmHg)

87

Heart rate (bpm)

O2 saturation (%)

82

Respiratory rate (/min)

14

Temperature (°C)

36.2

Urinary output (mL/kg/h)

0.54

Height (cm)

172

Potassium (mEq/L)

4.1

91

Blood glucose (mg/dL)

92

Hemoglobin (g/dL)

14.9

Weight (kg)

92

BMI

31.1

Sodium (mEq/L)

139

Physical examination

The items below characterize the patient's physical examination and monitoring findings on admission.

Airway

Airway observation

1st Priority

Airway is open, not obstructed, and safe.

Breathing

Chest palpation

Not a priority

Normal: 2L - normal; 2R - normal

Chest percussion

Not a priority

Right: 1R - resonance; 2R - resonance; 3R - resonance; 4R - resonance; 5R - resonance
 Left: 1L - resonance; 2L - resonance; 3L - superficial cardiac dullness; 4L - superficial cardiac dullness; 5L - resonance

O2 Sat (%)

1st Priority

91 %

Pulmonary auscultation

2nd Priority

Clear to auscultation, with normal breath sounds at all sites.

Respiratory rate (/min)

1st Priority

14 rpm

Circulation

Blood pressure (mmHg)

1st Priority

171/87 mmHg

Capillary refill time (s)

Not a priority

1 second

Cardiac auscultation

2nd Priority

Regular rate and rhythm, normal S1 and S2 sounds, no murmurs, gallops, or

Heart rate (bpm)	1st Priority	rubs. 82 bpm
Pulse palpation	Not a priority	Central - Amplitude: normal; Arrhythmic; Peripheral - Amplitude: normal; Arrhythmic.
Urinary output (mL/kg/h)	2nd Priority	0.54 mL/kg/h
Disability		
Blood glucose (mg/dL)	1st Priority	92 mg/dL
Double simultaneous stimulation	1st Priority	Double sensitive stimulation is not performable due to sensory impairment in the right hemibody. Double visual stimulation is not performable due to right hemianopia.
Extraocular movements	2nd Priority	Deviated to the left
Face sensitivity	2nd Priority	Patient does not react to stimulus on the right side of the face.
Facial motor assessment	1st Priority	Right central facial palsy.
Finger-nose-finger test	2nd Priority	Not able to perform on the right side.
Glasgow Coma Scale	2nd Priority	10 (E3-V2-M5)
Language assessment	1st Priority	Verbal fluency - Impaired Verbal comprehension - Impaired Naming - Impaired
Left ankle strength	1st Priority	Patient demonstrates normal strength, bearing resistance to movement in both dorsiflexion and plantar flexion of the ankle.
Left hip strength	1st Priority	Patient demonstrates normal strength, bearing resistance to movement in both extension and flexion of the hip.
Left knee strength	1st Priority	Patient demonstrates normal strength, bearing resistance to movement in both extension and flexion of the knee.
Light touch sensitivity	2nd Priority	Impaired light touch perception in the right hemibody.
Mingazzini manoeuvre	1st Priority	No movement in the right limb. Normal movement on the left limb.

Pain and temperature sensitivity	2nd Priority	Impaired perception of algic stimuli in the right hemibody.
Pronator drift	1st Priority	No movement in the right limb. Normal movement on the left limb.
Pupil light reflex	2nd Priority	Normal
Response to simple verbal commands	1st Priority	Patient is not able to comprehend commands in closing and opening the eyes and grip and release the hand.
Right ankle strength	1st Priority	No movement in the right ankle.
Right hip strength	1st Priority	No movement in the right hip.
Right knee strength	1st Priority	No movement in the right knee.
Tone	Not a priority	Upper limbs Left side - Normal Right side - Hypotonic Lower limbs Left side - Normal Right side - Hypotonic
Visual fields	1st Priority	-
Exposure		
Abdominal auscultation	Not a priority	Normal bowel sounds without abdominal murmurs.
Abdominal palpation	Not a priority	No rigidity. No pain. No guarding or signs of peritoneal irritation. No masses or palpable organomegalies.
Abdominal percussion	Not a priority	6R - tympanic; 7R - tympanic; 6L - tympanic; 7L - tympanic
Temperature (°C)	2nd Priority	36.2°

Dialogues

This is a complete list of all possible dialogue questions (on the left) and the corresponding responses (on the right).

Greeting and Introduction

01. Could you please tell me your name?	Boo... streen...
1st Priority	

02. Could you please tell us
your age?

1st Priority

Remeen... leeff...

03. Do you know where you
are right now?

1st Priority

Diabee...know..

History Taking

Chief Complaint

04. How are you feeling?

1st Priority

Boo... streen...

05. What happened to you?

2nd Priority

Remeen... leeff...

06. Do you know what month
it is?

1st Priority

Boo... streen...

History of Present Illness

07. When was the last time
you had something to eat?

Not a priority

Diabee...know..

08. What were you doing
when you felt ill?

2nd Priority

Stree... boo...

09. How long has it been
since the symptoms started?

2nd Priority

Diabee...know..

10. What was the last thing

Stree... boo...

you ate?

Not a priority

11. Were you doing any physical activity when you became ill?

Haavv... laa...

Not a priority

12. Can you please repeat: MAMA, TIP-TOP, FIFTY-FIFTY, THANKS, HUCKLEBERRY, BASEBALL PLAYER.

Haavv... laa...

1st Priority

13. Are you in pain at all?

Haavv... laa...

2nd Priority

Past Medical/Surgical History

14. Do you have any other health problems?

Diabee...knoww..

2nd Priority

Medications and Allergies

15. Are you currently taking any medication?

Haavv... laa...

2nd Priority

16. Have you had any side effects from your medication?

Boo... streen...

Not a priority

17. Do you have any allergies?

Stree... boo...

1st Priority

Social History

18. Can you please tell me what you usually eat?	Not a priority	Remeen... leeff...
19. How active are you?	Not a priority	Diabee...knoow..
20. Have you been under any stress lately?	Not a priority	Boo... streen...
21. How often do you consume alcohol?	Not a priority	Remeen... leeff...
22. Are you a smoker?	Not a priority	Haavv... laa...
23. Have you felt any changes to your appetite?	Not a priority	Remeen... leeff...
24. Any recent weight changes?	Not a priority	Boo... streen...

Medical Tests

The items below describe the possible test results in this scenario, including rules that may affect those results.

Decision aids

Stroke scale (NIHSS)

1st Priority

Electrophysiology

12-Lead ECG

2nd Priority

Sinus rhythm.

Imaging

Cerebral CT angiography	1st Priority	Occlusion of the M1 segment of the left middle cerebral artery. No other pathological findings are visible.
Cerebral perfusion CT	1st Priority	Decreased Cerebral Blood Flow (CBF) and prolonged Mean Transit Time (MTT) in the left frontotemporoparietal lobes (complete territory of the Middle Cerebral Artery). Cerebral Blood Volume (CBV) is also decreased in the same territory indicating no perfusion mismatch.
Chest CT	Not a priority	Absence of significant changes of pulmonary parenchyma density and pleural effusion.
Chest X-Ray	Not a priority	No visible alterations.
Head CT	1st Priority	Hypodense lesion in the left frontoparietal cortices corresponding to a subacute ischemic infarct on 1/2 of the territory of the left middle cerebral artery. Spontaneous hyperdensity in the M1 and M2 segments of the left middle cerebral artery, likely related to intravessel thrombus. The cerebral cisterns and ventricles are of normal volume. There are no signs of bone fractures. ASPECTS: 5
Neck Doppler ultrasound	2nd Priority	No significant alterations
Transcranial Doppler	2nd Priority	Occlusion of the proximal M1 segment of the left MCA. All other intracranial arteries have normal flow.
Transesophageal echocardiogram	Not a priority	No alterations
Transthoracic echocardiogram	Not a priority	No alterations found to cardiac morphology. Normal left ventricular systolic function.

Lab tests

Arterial blood gas	Not a priority	Blood pH - 7.35 PaO2 (mmHg) - 61 PaCO2 (mmHg) - 46.43 HCO3- (mEq/L) - 25
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		BE (mEq/L) - -0.13 O2 sat (%) - 91 Na+ (mEq/L) - 139 K+ (mEq/L) - 4.1 Cl- (mEq/L) - 102 Anion gap (mEq/L) - 11.2 Lactate (conventional) (mg/dL) - 9.0
Biochemistry	2nd Priority	BUN (mg/dL) - 19 Na+ (mEq/L) - 139 K+ (mEq/L) - 4.1 AST (IU/L) - 21 ALT (IU/L) - 32 AST/ALT - 0.65 AP (IU/L) - 78 CK (IU/L) - 113 CRP (mg/L) - 2.3
Cardiac biomarkers	Not a priority	CK-MB Mass (ng/mL) - 2 Troponin I (ng/mL) - 0.01 Myoglobin (ng/mL) - 17
Coagulation tests	2nd Priority	aPTT (s) - 36 Prothrombin time (s) - 12.0 INR - 1.0
Complete blood count	1st Priority	Leukocytes (/μL) - 8500 Neutrophils (/μL) - 4500 (53%) Lymphocytes (/μL) - 3200 (38%) Monocytes (/μL) - 410 (5%) Eosinophils (/μL) - 280 (3%) Basophils (/μL) - 110 (1%) Immature granulocytes (/μL) - 0 (0%) Erythrocytes (×10 ⁶ /μL) - 4.8 Hemoglobin (g/dL) - 14.9 Hematocrit (%) - 44 MCV (μm ³) - 92 MCH (pg/cell) - 30 MCHC (g/dL) - 35 RDW (%) - 12.0 Platelets (×10 ³ /μL) - 222
Lipid profile	Not a priority	Total cholesterol (mg/dL) - 171 Triglycerides (mg/dL) - 145 HDL cholesterol (mg/dL) - 69 LDL cholesterol (mg/dL) - 73
Urinalysis	Not a priority	Specific gravity - 1.024 pH - 6.0 Urine color - Yellow Appearance - Clear

WBC esterase - Negative
Protein - Negative
Albumin - Negative
Glucose - Negative
Ketones - Negative
Erythrocytes - Negative
Bilirubin - Negative
Urobilinogen, Semi-Qn - 0.0
Nitrite - Negative
Intoxicants - Negative

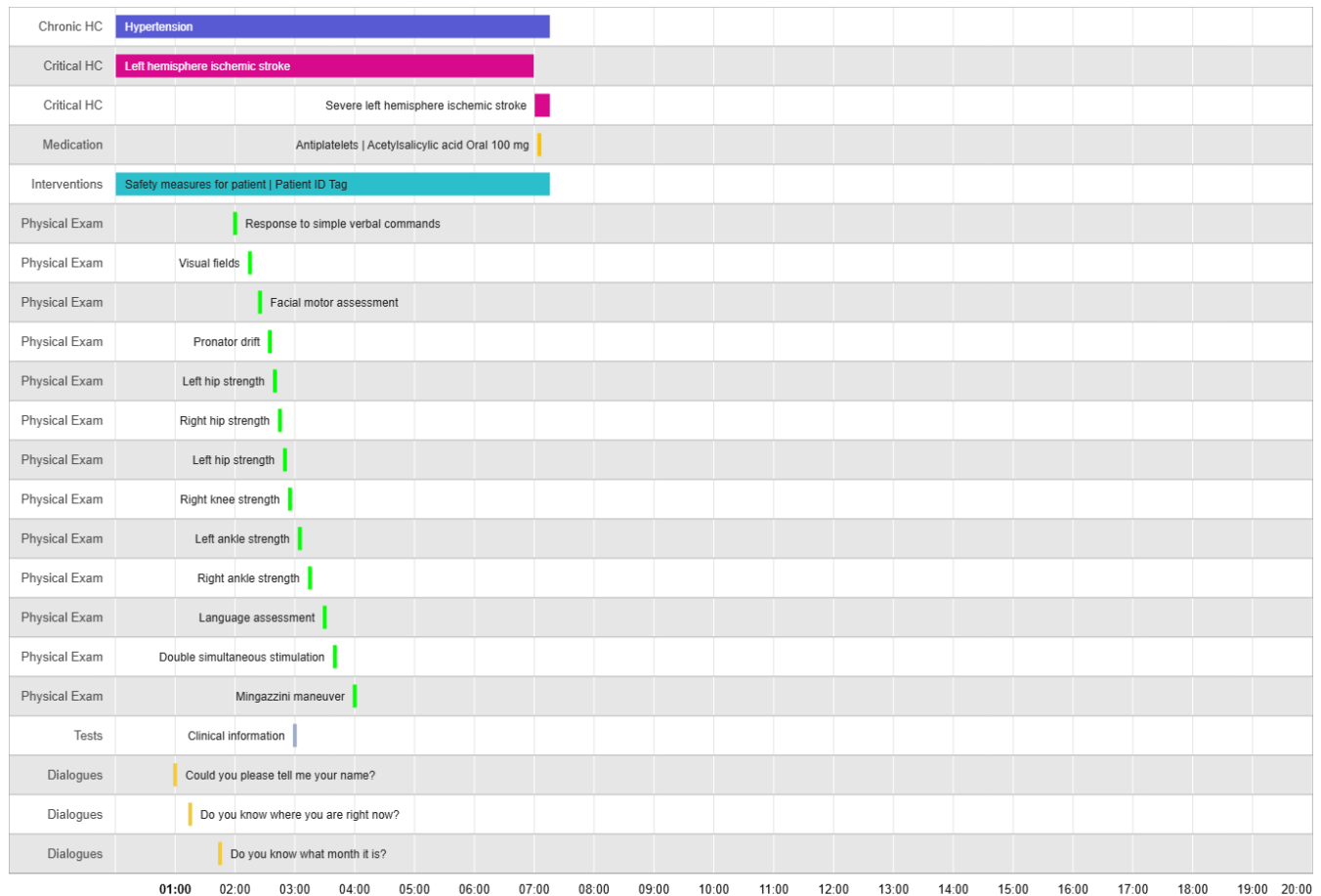
Initial notifications

Initial notifications presented to the trainee after a specified amount of time after starting the simulation

Medical test	Time
Clinical information	03:00

Optimal clinical approach

This section previews how the optimal approach resolves the scenario successfully. Comparison with Baseline may be useful to understand the scenario behavior.



Management

The items below represent management actions relevant to solving this clinical scenario. Notes: 1st Priority – Mandatory items required for a successful outcome. 2nd Priority – Optional items considered adequate but not essential. Not a Priority – Unnecessary items that are inadequate or a waste of time.

i.61 - Medications - Antiplatelets

1st Priority

Medications | Antiplatelets |
Acetylsalicylic acid

Medications | Antiplatelets |
Clopidogrel

i.62 - Call - Stroke Unit

1st Priority

The Stoke Unit has been notified.

Call | Stroke unit

i.63 - Interventions - Oxygen

1st Priority

Interventions | Oxygen | High
flow mask

Interventions | Oxygen | Nasal
cannula

Question(s) during the simulation

Questions presented to the trainee in order to have a more detailed evaluation of the use of the clinical scenario.

Language assessment question:

Question

How would you classify the
patient's speech?

Correct answer

Global aphasia

2 Incorrect answer(s)

Wernicke aphasia

Dysarthria

Head CT question:

Question

Based on the patient's clinical

assessment and the head CT findings, select the most likely diagnosis:

Correct answer

Acute ischemic stroke

2 Incorrect answer(s)

Subdural hematoma

Transient ischemic attack

Head CT question:

Question

Does this CT have signs of any intracranial hemorrhage?

Correct answer

No

1 Incorrect answer(s)

Yes

Head CT question:

Question

Based on the neurological assessment, please rate the stroke severity:

Correct answer

Severe stroke

2 Incorrect answer(s)

Moderate stroke

Minor stroke

Head CT question:

Question

Are there any contraindications for thrombolysis?

Correct answer

Yes

1 Incorrect answer(s)

No

Cerebral CT angiography question:

Question

Which vascular lesion is visible?

Correct answer

Occlusion of the left M1 MCA segment

2 Incorrect answer(s)

No occlusion is visible

No changes. ASPECTS: 10

Cerebral CT angiography question:

Question

Does this patient have an indication for thrombectomy?

Correct answer

No, considering the established injury and premorbid functional status

2 Incorrect answer(s)

Yes

No, because the patient is > 80 years old

Question(s) after simulation

Questions presented to the trainee in order to have a more detailed evaluation of the use of the clinical scenario.

Summative Multiple Choice Question:

Question

What is the most likely diagnosis?

Correct answer

Ischemic stroke

3 Incorrect answer(s)

Subdural hematoma

Hemorrhagic stroke

Cerebral venous thrombosis

Formative Multiple Choice

Question:

Question

What is the patient's total NIHSS score at presentation?

Correct answer

26

2 Incorrect answer(s)

21

16

Formative Multiple Choice

Question:

Question

What is the patient's NIHSS score in the motor assessment of upper and lower limbs?

Correct answer

8

2 Incorrect answer(s)

6

4

Formative Multiple Choice

Question:

Question

Which of the following approaches may improve the patient's outcome?

Correct answer

Motor rehabilitation

2 Incorrect answer(s)

Hemicraniectomy

Carotid endarterectomy

Handoff question

Question presented to the trainee to assess their ability to effectively communicate patient information during a transition of care. This question is optional.

Question

Summarize this Body Interact

Review handoff pattern

scenario using a structured handoff pattern.

SBAR (Situation, Background, Assessment, Recommendation): Includes current condition and reason for handoff, relevant history and context, assessment details, and recommended actions.

SOAP (Subjective, Objective, Assessment, Plan): Covers patient-reported symptoms and history, measurable data and findings, clinical impressions and diagnoses, and the treatment plan.

I-PASS (Illness Severity, Patient Summary, Action List, Situation Awareness and Contingency Planning, Synthesis by Receiver): Encompasses illness status, patient background, tasks and actions, potential changes and plans, and confirmation of understanding.

AT-MIST (Age, Time of incident or onset of symptoms, Mechanism of injury/Medical Complaint, Injuries or Inspections head-to-toe, vital Signs, and Treatments): Describes the cause of injury or medical complaint, findings from head-to-toe inspection, vital signs, and treatments provided.

Simulation Ending Messages

Feedback messages shown to the user based on specific successful or unsuccessful approaches, triggered by defined conditional rules.

Title	Type	Message	Conditional
Success	Success	Excellent work! You gathered the full clinical history and ensured comprehensive patient care. This thorough approach guarantees safe and accurate management, allowing you to better meet your patient's needs. Keep it up!	
End condition	Failure	This is the end of your virtual simulation scenario.	

References

1. Berge E, Whiteley W, Audebert H, et al. European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke. *Eur Stroke J*. 2021;6(1):I-LXII.
2. Lyden P. Using the National Institutes of Health Stroke Scale: A Cautionary Tale. *Stroke*. 2017;48(2):513-519.
3. Wahlgren N, Moreira T, Michel P, et al. Mechanical thrombectomy in acute ischemic stroke: Consensus statement by ESO-Karolinska Stroke Update 2014/2015, supported by ESO, ESMINT, ESNR and EAN. *International Journal of Stroke*. 2016;11(1):134-147.