

SCRIPT

ACUTE ISCHEMIC STROKE WITH CONTRAINDICATION TO ALTEPLASE



SCENARIO

#34

NAME

JAMES KEVINSON

SPECIALTY

Neurology

DIFFICULTY LEVEL

ADVANCED

SIMULATION ENVIRONMENT

INTRA HOSPITAL - EMERGENCY ROOM

BODY INTERACT™
VIRTUAL PATIENTS

This patient is not a real patient, and the clinical scenario, while clinically plausible, is fictional.

Scenario

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

Title

Acute ischemic stroke with contraindication to alteplase

Context

Four hours ago, while watching television at home, James suddenly felt right-sided weakness and difficulty speaking. After his initial refusal, his wife convinced him that he needed medical assistance. A paramedic team was dispatched to bring him to the emergency department.

Briefing

Male, 65 years old. Sudden onset of speech impairment, right-sided weakness four hours ago. A smoker, with hypertension and dyslipidemia.

General learning objective

Recognize acute stroke.

Specific learning objectives

Start vital signs vigilance in acute care

Performance of neurological assessments (NIHSS)

Blood pressure management in acute stroke

Recognize contraindication to alteplase due to early CT changes

Pre-simulation notes

-

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

James Kevinson

Age

65 years

Race/Ethnicity

European/Caucasian

Smoker

Yes

Sedated

No

Agitated

No

Facial palsy

100

Renal metabolic compensation

Auto

Gender

Male

Eye color

Brown

Conscious

Yes

Confused

No

Last meal over 2h

Yes

Speech impairment

Yes

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)

190

Heart rate (bpm)

89

Respiratory rate (/min)

15

Temperature (°C)

36.4

Urinary output (mL/kg/h)

0.57

Height (cm)

175

Diastolic arterial blood pressure (mmHg)

105

O2 saturation (%)

92

Blood glucose (mg/dL)

112

Hemoglobin (g/dL)

14.7

Weight (kg)

82

BMI

26.8

Potassium (mEq/L)

4.1

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

Clear airway. Normal oropharynx. No readily audible abnormal breath sounds.

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

O2 Sat (%)

1st Priority

92%

Pulmonary auscultation

2nd Priority

Clear to auscultation, with normal vesicular murmurs in all sites.

Respiratory rate (/min)

1st Priority

15/min

Circulation

Blood pressure (mmHg)

1st Priority

190/105 mmHg

Capillary refill time (s)

Not a priority

1.3 seconds

Cardiac auscultation

2nd Priority

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

Heart rate (bpm)

1st Priority

89 bpm

Pulse palpation

Not a priority

Carotid- Strong and regular;
Radial- Strong and regular, equal on both sides;
Femoral- Strong and regular, equal on both sides;
Dorsalis pedis- Strong and regular,

Urinary output (mL/kg/h)	2nd Priority	equal on both sides. 139 mL/kg/h
Disability		
Blood glucose (mg/dL)	1st Priority	112 mg/dL
Glasgow Coma Scale	2nd Priority	Treatments administered: Alteplase 9 (E2-V2-M5); HC active: SevereShortDurationLeftIschemicEmbolicStroke 10 (E3-V2-M5); Default: 12 (E4-V3-M5)
Pupil light reflex	2nd Priority	Right: Size - 4 mm; Right eye light: 2 mm; Left eye light: 2 mm Left: Size - 4 mm; Right eye light: 2 mm; Left eye light: 2 mm
Exposure		
Abdominal auscultation	Not a priority	Normal hydro-aerial sounds without abdominal murmurs.
Abdominal palpation	Not a priority	Soft, depressible, painless. No visceromegaly.
Abdominal percussion	Not a priority	6R- tympanic; 7R- tympanic; 6L- tympanic; 7L- tympanic.
Temperature (°C)	2nd Priority	36.4°C

Dialogues

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

History Taking

Chief Complaint

01. How are you feeling?	1st Priority	Haaf... weeaak...
02. What happened to you?	1st Priority	Coould lii riigh.

History of Present Illness

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

Nee... haa.....

Not a priority

04. What were you doing when you felt ill?

Thii... boo.

2nd Priority

05. What was the last thing you ate?

Doo apaa haaf.

Not a priority

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

Haaf... weeaak...

Not a priority

07. Are you in pain at all?

Doo apaa haaf.

2nd Priority

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

Nee... haa.....

2nd Priority

Past Medical/Surgical History

09. Do you have any other health problems?

Nee... haa.....

2nd Priority

10. Do you have high blood pressure?

Doo apaa haaf.

2nd Priority

11. Do you have high cholesterol?

Thii... boo.

2nd Priority

12. Have you ever been diagnosed as having diabetes?

Thii... boo.

2nd Priority

13. Have you had any severe illnesses or injuries before?

Coouldd lii riigh.

2nd Priority

Medications and Allergies

14. Are you currently taking any medication?

Thii... boo.

2nd Priority

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

Haaf... weeaak...

2nd Priority

16. Are you taking any supplements?

Haaf... weeaak...

Not a priority

17. Do you have any allergies?

Doo apaa haaf.

1st Priority

Social History

18. Can you please tell me what you usually eat?

Coouldd lii riigh.

Not a priority

19. Have you been under any stress lately?

Coouldd lii riigh.

2nd Priority

20. How active are you?

Doo apaa haaf.

Not a priority

21. How often do you
consume alcohol?

Nee... haa.....

Not a priority

22. Do you eat snacks
between meals?

Thii... boo.

Not a priority

23. Are you a smoker?

Haaf... weeaak...

2nd Priority

24. Any recent weight
changes?

Haaf... weeaak...

Not a priority

25. Have you felt any changes
to your appetite?

Coould lii riigh.

Not a priority

26. Are you on a diet to lower
your cholesterol?

Nee... haa.....

2nd Priority

Education

Health Information and Promotion

27. Are you doing anything to
reduce your cholesterol
levels?

Coould lii riigh.

2nd Priority

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

AFTER ALTEPLASE - 28

HC active:

SevereShortDurationLeftIschemicEmbolicStroke
- 25

Default - 18

Electrophysiology

12-Lead ECG

2nd Priority

Sinus rhythm, no morphological changes

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 complete territory of the left middle cerebral artery corresponding to a subacute ischemic infarct. Spontaneous hyperdensity in the M1 and M2 segments of the left middle cerebral artery, likely related to intra vessel thrombus. Compression of the left ventricle due to mass effect of the ischemic lesion. There are no signs of bone fractures. ASPECTS: 0

Neck Doppler ultrasound

2nd Priority

Reduction of carotid flow by partial occlusion of the left carotid artery by

Transcranial Doppler	2nd Priority	atherosclerotic plaque. Stenosis grade: 70%.
Transesophageal echocardiogram	Not a priority	Occlusion of the proximal M1 segment of the left MCA. All other intracranial arteries have normal flow.
Transthoracic echocardiogram	Not a priority	No alterations.
Lab tests		
Arterial blood gas	Not a priority	No alterations found to cardiac morphology. Normal left ventricular systolic function.
Biochemistry	2nd Priority	Blood pH - 7.39 Hemoglobin (g/dL) - 14.7 PaCO₂ (mmHg) - 42 HCO₃⁻ (mEq/L) - 24.6 BE (mEq/L) - 0.02 Na⁺ (mEq/L) - 139 K⁺ (mEq/L) - 4.1 Lactate (mg/dL) - 9.0
Cardiac biomarkers	Not a priority	BUN (mg/dL) - 19 Na⁺ (mEq/L) - 139 K⁺ (mEq/L) - 4.1 AST (IU/L) - 21 ALT (IU/L) - 32 AP (IU/L) - 78 CK (IU/L) - 113 CRP (mg/L) - 2.3
Coagulation tests	2nd Priority	CK-MB Mass (ng/mL) - 2 Troponin I (ng/mL) - 0.01 Myoglobin (ng/mL) - 17 aPTT (s) - 36 Prothrombin time (s) - 12.0 INR - 1.0 D-Dimer (µg/mL) - 0.058
Complete blood count	2nd 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 (×10⁶/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 ($\times 10^3/\mu\text{L}$) - 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, Urine - Negative Intoxicants - Negative

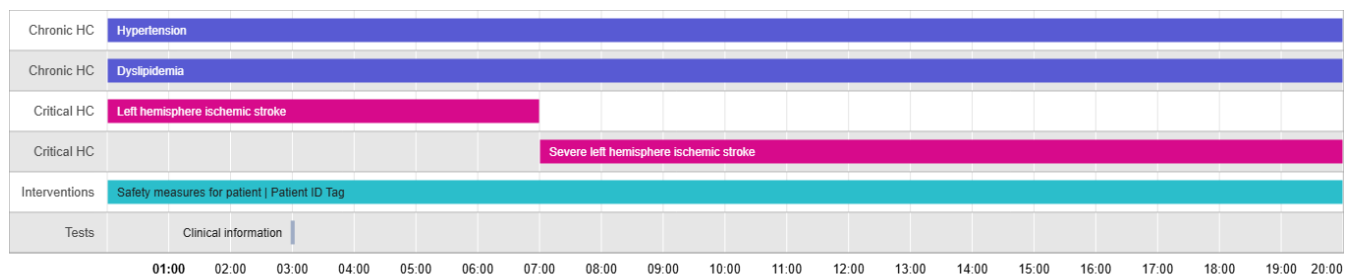
Initial notifications

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

Medical test	Time	
Clinical information	03:00	Source Emergency medical team report Previous medication: Family member informed that patient takes simvastatin and losartan. Other information: Onset of speech impairment and right sided weakness 4 hours ago.

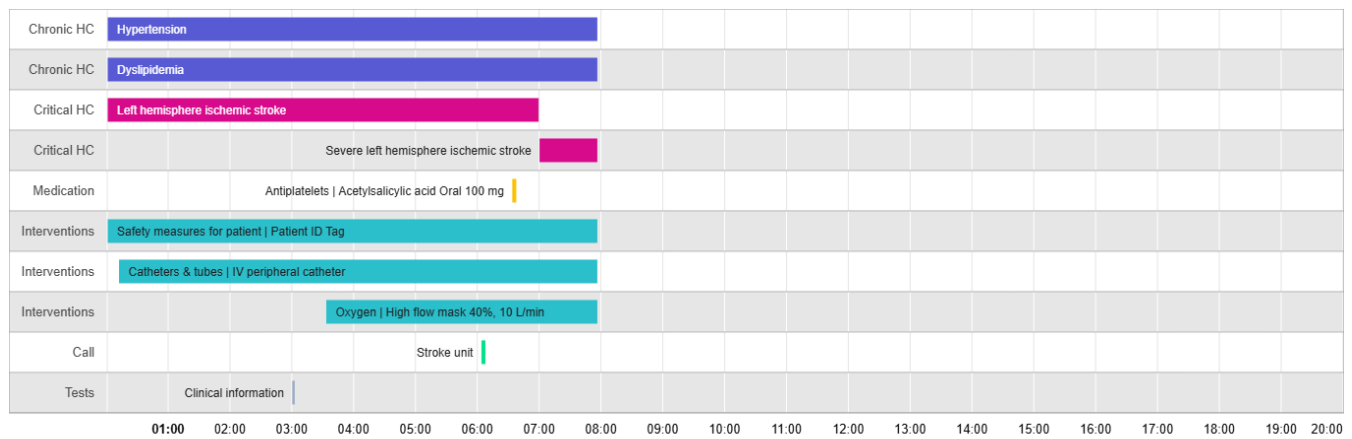
Baseline

This section is automatically generated and predicts scenario behavior assuming no actions by the trainee, which usually represents the worst-case scenario.



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.40 - To treat: ISCHEMIC EMBOLIC LEFT STROKE / SEVERE ISCHEMIC EMBOLIC LEFT STROKE WITH ALTEPLASE CONTRAINDICATION

1st Priority

Medications | Antiplatelets | Acetylsalicylic acid

Medications | Antiplatelets | Clopidogrel

i.41 - To treat: REDUCED OXYGENATION

2nd Priority

Interventions | Oxygen | High flow mask

Interventions | Oxygen | Nasal cannula

i.42 - Stroke Unit

1st Priority

Call | Stroke unit

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.

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)

Hemorrhagic stroke

Subarachnoid hemorrhage

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, because the patient has a large ischemic lesion

2 Incorrect answer(s)

Yes, because the symptoms started 4 hours ago

No, the patient has no contraindications to alteplase

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

Occlusion of the left M3 MCA segment

Cerebral CT angiography question:

Question

What is the extent of the established ischemic infarct in the CT scan?

Correct answer

Large infarct. ASPECTS: 0

2 Incorrect answer(s)

No changes. ASPECTS: 10

Moderate lesion. ASPECTS: 6

Cerebral CT angiography question:

Question

Does this patient have an indication for thrombectomy?

Correct answer

No

1 Incorrect answer(s)

Yes

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)

Cerebral tumor

Hemorrhagic stroke

Encephalitis

**Formative Multiple Choice
Question:**

Question

Which of the following interventions can improve the clinical outcome?

Correct answer

Admission to Stroke Unit, use of antiplatelet

2 Incorrect answer(s)

Admission to Stroke Unit, external Ventricular Drainage

Aggressive Blood Pressure control, prevention of infectious complications

**Formative Multiple Choice
Question:**

Question

Will this patient have an indication for hemicraniectomy?

Correct answer

Yes, the patient may need hemicraniectomy within the first 48 hours

2 Incorrect answer(s)

Yes, the patient should undergo hemicraniectomy within the first 24 hours after stroke

No, this patient will never have an indication for hemicraniectomy

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 scenario using a structured handoff pattern.

Review 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!	
02. Failure	Failure	This is the end of your virtual simulation scenario.	

References

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