

SCRIPT

SEVERE STROKE IN 30 YEARS OLD
PATIENT



SCENARIO **#292**

NAME

PATRICIA GENTRY

MEDICAL CATEGORY

Neurology

SCENARIO DIFFICULTY

INTERMEDIATE

SIMULATION ENVIRONMENT

EMERGENCY ROOM

Scenario

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

Title

Severe stroke in 30 years old patient

Context

Patricia was having a shower when she suddenly felt a headache on the right side and weakness in the left limbs.

Briefing

Female patient, aged 30 years, is brought to the emergency room due to a left hemiparesis and right-sided headache with acute onset one hour ago.

General learning objective

Management of an acute stroke patient.

Specific learning objectives

Recognize signs of an acute stroke

Decision making regarding reperfusion therapy

Know indications and contra-indications to intravenous thrombolysis and thrombectomy

Environment

Emergency room

Speciality

Neurology

Difficulty

Intermediate

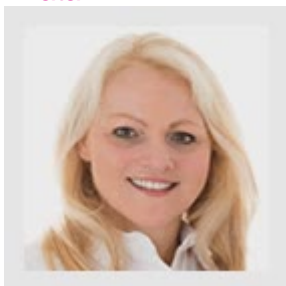
Authors

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Patient characteristics

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

Avatar



First name

Patricia

Last name

Gentry

Age

30

Gender

Female

Race/Ethnicity

Caucasian

Model



Hair color

Light blonde

Eye color

Blue

Smoker

Yes

Conscious

Yes

Sedated

No

Confused

No

Agitated

No

Last meal over 2h

No

Acetylsalicylic acid intolerance

No

Facial palsy

100

Speech impairment

No

Eyelid closure

0

Notes

The patient has right facial palsy (left mouth deviation).

Patient parameters

These parameter values are used by the simulator to initialize this scenario.

Systolic arterial blood pressure (mmHg)

173

Diastolic arterial blood pressure (mmHg)

105

Heart rate (bpm)

75

O2 saturation (%)

96

Respiratory rate (/min)

14

Blood glucose (mg/dL)

123

Temperature (°C)

36

Hemoglobin (g/dL)

15

Urinary output (mL/kg/h)

0.75

Weight (kg)

74

Potassium (mEq/L)

4.1

Height (cm)

162

BMI

28.20

Sodium (mEq/L)

138

ABCDE assessment

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

Airway

Airway observation

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

O2 Sat (%)

1st Priority

96

Pulmonary auscultation

Not a priority

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

Respiratory rate (breath/min)

2nd Priority

14

Circulation

Blood pressure (mmHg)

1st Priority

173/105

Capillary refill time (seconds)

Not a priority

1.3

Heart auscultation

2nd Priority

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

Heart rate (bpm)

1st Priority

75

Pulse palpation

Not a priority

Carotid - Amplitude: normal; Rhythmic;
Radial - Amplitude: normal; Rhythmic, both sides equal;
Femoral - Amplitude: normal; Rhythmic, both sides equal;
Dorsalis pedis & Posterior tibial - Amplitude: normal; Rhythmic, both sides equal;
Popliteal - Amplitude: normal; Rhythmic, both sides equal.

Urinary output (mL/kg/h)

Not a priority

0.75

Disability

Blood Glucose (mg/dL)	1st Priority	123
Glasgow Coma Scale	2nd Priority	15 (E-4; V-5; M-6) - Initial state and after thrombectomy 12 (E-3; V-4; M-5) - after stroke aggravation
Pupil light reflex	Not a 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	No visceromegaly.
Abdominal percussion	Not a priority	6R - tympanic; 7R - tympanic; 6L - tympanic; 7L - tympanic
Temperature (°C)	1st Priority	36

Dialogues

This is a complete list of all the possible dialogue lines both by the health practitioner (on the left) and respective responses by the patient (on the right).

Medical condition

01. How are you feeling?	2nd Priority	I am not feeling well. I have difficulty moving my left arm and leg. I also have a strong headache on the right.
02. Feeling pain?	2nd Priority	Yes, I have a strong headache on the right.
03. When did your symptoms start?	1st Priority	One hour ago.
04. What happened to you?	1st Priority	I was taking a shower and suddenly I couldn't stand anymore because I had difficulty moving my left limbs.
05. Do you have concomitant health conditions?	2nd Priority	I have frequent headaches, almost every day, and I take common painkillers.
06. Did you have any severe illness or injury before?	2nd Priority	No.
07. Previous hospitalization?	2nd Priority	No.
08. Any recent weight changes?	Not a priority	No.

Medication

01. What medication have you been taking?	1st Priority	I take the pill.
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Nutrition

- | | | |
|--|----------------|--------------------|
| 01. Describe your diet. | Not a priority | Relatively normal. |
| 02. How many meals per day? | Not a priority | Five. |
| 03. Have there been changes in appetite? | Not a priority | No. |
| 04. Last time you ate? | Not a priority | Two hours ago. |

Activity

- | | | |
|----------------------------|----------------|-----------------|
| 01. Do you exercise often? | Not a priority | No, not really. |
|----------------------------|----------------|-----------------|

Risk factors

- | | | |
|---------------------------------------|----------------|---|
| 01. Do you have hypertension? | Not a priority | No. |
| 02. Do you have high cholesterol? | Not a priority | No. |
| 03. Recently under stress? | Not a priority | Nothing out of the ordinary. |
| 04. Frequency of alcohol consumption? | Not a priority | No, nothing. |
| 05. Do you smoke? | Not a priority | Yes, since I was 18. I smoke approximately 15 cigarettes per day. |

Diagnostic strategies

The items below characterize the test results that are possible during this scenario, including rules that may condition test results.

Decision aids

- | | | |
|----------------------|--------------|---|
| Stroke scale (NIHSS) | 1st Priority | 000222(0302)01011=14 (Initial - Short-term right ischemic embolic stroke)
121222(0403)02021=22 (Short-term severe right ischemic embolic stroke)
000102(0201)01010=8 (after thrombectomy) |
|----------------------|--------------|---|

Electrophysiology

- | | | |
|-------------|----------------|---------------------|
| 12-Lead ECG | Not a priority | Normal sinus rhythm |
|-------------|----------------|---------------------|

Imaging

- | | | |
|-----------------------|--------------|--|
| Cerebral CT angiogram | 1st Priority | Occlusion of right Internal Carotid Artery, in the supraclinoid portion, with extension to the ipsilateral A1 and M1 segments, representing a 'carotid T' occlusion. The remaining extra- and intra-cranial arteries are normal. |
|-----------------------|--------------|--|

Cerebral perfusion CT	Not a priority	Large area of cerebral blood flow impairment and increase in mean transit time in the whole territory of the right middle cerebral artery.
Chest CT scan	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	No acute lesions are visible in the cerebral parenchyma. The right M1 segment of the Middle Cerebral Artery is hyperdense, suggesting the presence of an acute thrombus.
Neck Doppler ultrasound	Not a priority	ASPECTS:10 Normal carotid artery flow.
Transcranial doppler	Not a priority	Occlusion of the distal intracranial segment of the right Internal Carotid Artery.
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 - 7.39 PaCO ₂ (mmHg) - 42 HCO ₃ ⁻ (mEq/L) - 24.6 BE (mEq/L) - 0.02 Cl ⁻ (mEq/L) - 102 Lactate (mg/dL) - 9.0 Due to simulation of test imprecision, there may be slight differences in the actual results.
Biochemistry	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 Due to simulation of test imprecision, there may be slight differences in the actual results.
Cardiac markers	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 D-Dimer (ug/mL) - 0.058

Complete blood count 2nd Priority

Leukocytes (/uL) - 8500
Neutrophils (/uL) - 4500 (53%)
Lymphocytes (/uL) - 3200 (38%)
Monocytes (/uL) - 410 (5%)
Eosinophils (/uL) - 280 (3%)
Basophils (/uL) - 110 (1%)
Immature granulocytes (/uL) - 0 (0%)
Erythrocytes ($\times 10^6/\mu\text{L}$) - 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
Cholesterol ratio (Tchol/HDL-C) - 2.5

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

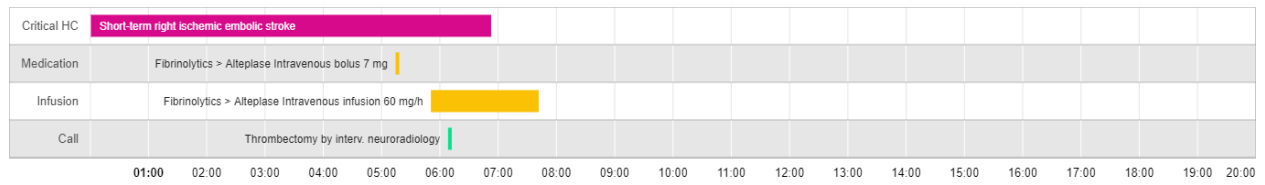
Baseline

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.



Health conditions

This section characterizes the illnesses, or Health conditions, the patient may be afflicted with in this scenario. These serve important foundational purposes in the Scenario, as they can be used to: affect what the patient says in Dialogues; influence how the patient deteriorates over time; condition Examination, Medical test and Call results; and determine the adequate Clinical approach required to solve the case successfully.

Critical health conditions

Short-term right ischemic embolic stroke

Description: Moderate right cerebral artery blockage due to a thrombus originating in another part of the body with an onset less than 4.5 hours ago. After some time leads to severe short duration right ischemic embolic stroke.

Solution: Fibrinolytic.

Short-term severe right ischemic embolic stroke

Description: Severe right cerebral artery blockage due to a thrombus originating in another part of the body with an onset less than 4.5 hours ago. Does not directly lead to other conditions.

Solution: Fibrinolytic.

Treatment priorities

Treatment items that are considered necessary or adequate to solve this scenario are listed below. Notes: 1st Priority - mandatory items to solve the case successfully. 2nd Priority - optional items that are considered adequate, but are not essential. Not a Priority - unnecessary items that are considered inadequate or a waste of time.

Medications

01

Alteplase

1st Priority

Call

01

Thrombectomy by interv.
neuroradiology

1st Priority

Differential diagnosis

Multiple choice question presented to the trainee in order to confirm whether they got the diagnosis right.

Correct answer Right hemisphere ischemic stroke

3 Incorrect answers Right hemisphere hemorrhage

Epileptic fit

Encephalitis

Ending messages

Feedback messages presented to trainees for particular successful or failed approaches and the respective conditional rules that trigger these messages.

Title	Type	Message	Conditional
End condition	Success	Congratulations, your practice meets the guidelines' requirements.	All Health conditions have been treated (Thrombectomy + Alteplase)
Thrombectomy performed (but alteplase not administered)	Success	You have solved the case with clinical success. However, your decisions weren't fully compliant with current treatment guidelines.	Alteplase not administered
If thrombectomy is not performed	Failure	You have not used all the recommended treatments for the patient.	Treatments not administered: Cath Lab (Thrombectomy)

References

1. Committee TESO (ESO) EC and the EW. Guidelines for Management of Ischaemic Stroke and Transient Ischaemic Attack 2008. *Cerebrovascular Diseases*. 2008;25(5):457-507.
2. Powers WJ, Rabinstein AA, Ackerson T, et al. 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. 2018;49(3):e46-e99.
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.