

Case 34
Acute ischemic stroke with contraindication to alteplase (James Kevinson)

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Version: V8

Date: 26/09/2019

Body Interact v5

OVERVIEW



CONTEXT	Four hours ago, while watching television at home, James suddenly felt right-sided weakness and difficulty speaking. After 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. Hypertension, dyslipidemia and smoking.		
LEARNING OBJECTIVES	GENERAL	Recognize acute stroke;	
	SPECIFIC	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.	
PATIENT CHARACTERIZATION	Patient name:	James Kevinson	Age (years): 65
	BMI:	26.8 (overweight)	Sex: Male
	Weight (kg):	82	Height (cm): 175
	Weight (lb):	181	Height (in): 69
	Chronic conditions:	Hypertension; Dyslipidemia.	

Notes: These patients are not real patients and their clinical cases, whilst clinically plausible, are fictional.

ABCDE ASSESSMENT

CATEGORY	PARAMETERS	EVALUATION	PRIORITY
AIRWAY	Breath sounds	Normal	1st Priority
	Airway observation	Clear	1st Priority
BREATHING	Signs of respiratory distress	Normal	1st Priority
	Respiratory rate	15/min	1st Priority
	Chest excursion	Normal	1st Priority
	Chest deformity, raised JVP, chest drains	Normal	1st Priority
	O2 Sat	92%	1st Priority
	Chest percussion	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.	Not a Priority
	Chest palpation	2L- normal; 2R- normal	Not a Priority
CIRCULATION	Pulmonary auscultation	Normal	2nd Priority
	Hands and digits	Pink and warm	1st Priority
	Heart rate	89 bpm	1st Priority
	Peripheral pulses	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, equal on both sides.	Not a Priority
	Blood pressure	190 / 105 mmHg	1st Priority
	Capillary refill time (CRT)	1.3 seconds	Not a Priority
	Heart auscultation	Normal	2nd Priority
	Urinary output	139 mL/kg/h / 11398 mL/h	2nd Priority
PUPILS	External hemorrhage (wounds), drains, concealed hemorrhage	No	2nd Priority
	<u>Pupils (size, equality and reaction to light)*</u>	Equal and reactive to light	2nd Priority

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DISABILITY	Level of consciousness (Glasgow Coma Scale)	12 (E4-V3-M5)	2nd Priority
	Blood Glucose	112 mg/dL / 6.216 mmol/L	1st Priority
EXPOSURE	<i>Full body (front)*</i>	Normal	Not a Priority
	<i>Full body (back)*</i>	Normal	Not a Priority
	Abdomen percussion	6R- tympanic; 7R- tympanic; 6L- tympanic; 7L- tympanic.	Not a Priority
	Abdomen palpation	Soft, depressible, painless. No visceromegaly.	Not a Priority
	Temperature	36.4 °C / 97.52 °F	2nd Priority

* In the current version of the case, these procedures are not implemented.

Clinical Information

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.
Note:	This information will appear automatically 3 minutes after the start of the simulation.

DIALOGUES

Specification of dialogues with the patient during simulation:

CATEGORY	Question Availability	#	QUESTION	PATIENT REPLY	REPLY CONDITIONAL	PRIORITY
Medical condition	-	1	How are you feeling?	Haaf... weeaak...	-	1st Priority
	-	2	What happened to you?	Coould lii riigh.	-	1st Priority
	-	3	Do you have concomitant health conditions?	Nee... haa.....	-	2nd Priority
	-	4	Feeling pain?	Doo apaa haaf.	-	2nd Priority
	-	5	Diabetes diagnosis?	Thii... boo.	-	2nd Priority
	-	6	Any recent weight changes?	Haaf... weeaak...	-	Not a Priority
	-	7	History of severe illness?	Coould lii riigh.	-	2nd Priority
	-	8	Time since symptom onset?	Nee... haa.....	-	2nd Priority
	-	9	Do you have any allergies?	Doo apaa haaf.	-	2nd Priority
Medication	-	10	Taking any medication?	Thii... boo.	-	2nd Priority
	-	11	Medication side-effects present?	Haaf... weeaak...	-	2nd Priority
Nutrition	-	12	Describe your diet.	Coould lii riigh.	-	Not a Priority
	-	13	Last time you ate?	Nee... haa.....	-	Not a Priority
	-	14	What did you eat last time?	Doo apaa haaf.	-	Not a Priority
	-	15	Snacks between meals?	Thii... boo.	-	Not a Priority
	-	16	Do you take dietary supplements?	Haaf... weeaak...	-	Not a Priority
	-	17	Have there been changes in appetite?	Coould lii riigh.	-	Not a Priority
Activity	-	18	Adhering to cholesterol-lowering diet?	Nee... haa.....	-	2nd Priority
	-	19	How active are you?	Doo apaa haaf.	-	Not a Priority
	-	20	What were you doing when you felt ill?	Thii... boo.	-	2nd Priority
Risk factors	-	21	Physical effort at time of event?	Haaf... weeaak...	-	Not a Priority
	-	22	Recently under stress?	Coould lii riigh.	-	2nd Priority
	-	23	Frequency of alcohol consumption?	Nee... haa.....	-	Not a Priority
	-	24	Are you hypertensive?	Doo apaa haaf.	-	2nd Priority
	-	25	High cholesterol present?	Thii... boo.	-	2nd Priority
	-	26	Are you a smoker?	Haaf... weeaak...	-	2nd Priority

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-	27	Measures to reduce high cholesterol?	Coould lii riigh.	-	2nd Priority
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INITIAL SIMULATION CONDITIONS				
CATEGORY	DESIGNATION	COMMENTS		
Signs & symptoms	Broca aphasia	Due to Stroke		
	Right sided weakness including facial asymmetry	Due to Stroke		
Acute conditions at case start	Ischemic embolic stroke (left side, short duration)	-		
	Increased blood pressure	Due to Stroke		
Parameters at case start:	Blood pressure (mmHg):	190 / 105		
	Heart rate (bpm):	89		
	Respiratory rate (/min):	15		
	O ₂ saturation (%):	92		
	Blood glucose (mg/dL):	112	Blood glucose (mmol/L):	6.22
	Temperature (°C):	36.4	Temperature (°F):	98
	Hemoglobin (g/dL):	14.7		
	Urinary output (mL/kg/h):	0.57		

SEQUENCING OF CLINICAL CONDITIONS

Description of the predefined evolution of the patient's state:

SIMULATION TIME (MIN)	EVENT	
0	Initial conditions:	- Ischemic stroke of left hemisphere - Increased blood pressure
1		
2		
3		
4		
5		
6		
7		- Left ischemic embolic stroke causes Severe Left ischemic embolic stroke
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EXAMINATION PROCEDURES

Examination procedures relevant for the case with detailed results:

CATEGORY	TEST NAME	RESULT DESCRIPTION		
Physical exam	Glasgow coma scale	HEALTH CONDITIONS	TEST	RESULT
		LEFT HEMISPHERE ISCHEMIC STROKE OR AFTER ANTIPLATELET OR NO STROKE	Eye opening	4 - Spontaneous
			Verbal response	3 - Words
			Motor response	5 - Localizing
			Total result	12 - Moderate impairment of consciousness
		HEALTH CONDITIONS	TEST	RESULT
		SEVERE LEFT HEMISPHERE ISCHEMIC STROKE	Eye opening	3 - To sound
			Verbal response	2 - Sounds
			Motor response	5 - Localizing
			Total result	10 - Moderate impairment of consciousness
		HEALTH CONDITIONS	TEST	RESULT
		AFTER ALTEPLASE	Eye opening	2 - To pressure
	Verbal response	2 - Sounds		
	Motor response	5 - Localizing		
	Total result	9 - Moderate impairment of consciousness		

DIAGNOSTIC STRATEGIES

Complementary strategies for diagnosis relevant for the case:

CATEGORY	TEST NAME	RESULT DESCRIPTION	PRIORITY	
Imaging	Carotid Doppler Ultrasound	Left internal carotid artery: 70% stenosis	2nd Priority	
	Head CT	Ischemic hypodense lesion in the whole territory of left middle cerebral artery (contra-indication for tPA protocol)	1st Priority	
	Cerebral angio CT	Occlusion of M1 segment of left MCA	1st Priority	
	Cerebral perfusion CT	Absence mismatch in left MCA territory	1st Priority	
	Transcranial doppler	M1 Left Occlusion	2nd Priority	
Lab tests	Biochemistry	No significant alterations	2nd Priority	
	Complete blood count	No significant alterations	2nd Priority	
	Coagulation Tests	No significant alterations	2nd Priority	
Electrophysiology	12-Lead ECG	Sinus rhythm, no morphological changes	2nd Priority	
Decision aids	Stroke Scale (NIHSS)	HEALTH CONDITIONS	TEST	RESULT
		1.a- Level of Consciousness 0- Alert, Keenly responsive; 1-Not Alert; but arousable by minor stimulation; 2- Not Alert, requires repeated and strong stimulation;- 3-coma.	0 - Alert, Keenly responsive	
		1.b- LOC- Questions (month and age) 0- Both correct; 1- one correct; 2- none correct.	2 - None correct	
		1.c- LOC - Verbal Commands (open/close eyes, grip/release non-paretic hand) 0-both tasks correctly; 1- one task correctly; 2- none task correctly.	0 - Both tasks correctly	
		2- Best gaze (Only horizontal eye movements, voluntary or reflexive) 0- Normal; 1- partial gaze palsy; 2- forced deviation.	0 - Normal	
		3- Visual fields (stimuli or threats in each eye's 4 quadrants) 0- No visual loss; 1- partial hemianopia ; 2- complete hemianopia; 3- bilateral hemianopia (blind/cortical blindness).	2 - Complete hemianopia	
		4- Facial palsy 0- Normal; 1- Right side minor paralysis; 1- Left side minor paralysis; 2- Right side partial paralysis; 2- Left side partial paralysis; 3- Right side complete paralysis; 3- Left side complete paralysis.	2 - Right side partial paralysis	
		5.a- Motor Right Arm (10" sitting at 90°, supine at 45°) 0- No drift; 1- drift, drifts does not hit bed; 2- Some effort against gravity; drifts down to bed; 3- No effort against gravity, limb falls; 4- No movement; UN - amputation or join fusion.	4 - No movement	
		LEFT HEMISPHERE ISCHEMIC STROKE OR		

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	AFTER ANTIPLATELET OR NO THERAPY	5.b- Motor Left Arm (10" sitting at 90°, supine at 45°)	0 - No drift	1st Priority
		6.a- Motor Right Leg (5" lying at 30°)	2 - Some effort against gravity; Drifts down to bed	
		6.b- Motor Left Leg (5" lying at 30°)	0 - No drift	
		7- Limb ataxia (finger-nose-finger; heel-shin) 0- Absent; 1- Present in one limb; 2- Present in two limbs; UN- amputation or join fusion.	0 - Absent	
		8- Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) 0- Normal; 1- mild to moderate sensory loss; 2- Severe to total sensory loss).	2 - Severe to total sensory loss	
		9- Best Language (name items, describe a picture, read sentences) 0- No aphasia; 1- mild to moderate aphasia; 2- severe aphasia; 3- mute, global aphasia.	2 - Severe aphasia	
		10- Dysarthria (clarity of articulation of speech when reading or repeating words) 0- Normal; 1- mild to moderate dysarthria; 2-severe dysarthria; mute/anarthric UN-intubated or other physical barrier.	2 - Severe dysarthria; Mute/anarthric	
		11-Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosagnosia) 0- No abnormality; 1-Visual, tactile, auditory, spatial or personal inattention or extinction to one modality; 2- Profound hemi-inattention or extinction to more than one modality.	0 - No abnormality	
		Total	18 - Moderate to severe stroke	
		HEALTH CONDITIONS	TEST	
1.a- Level of Consciousness 0- Alert, Keenly responsive; 1-Not Alert; but arousable by minor stimulation; 2- Not Alert, requires repeated and strong stimulation;- 3-coma.	1 - Not Alert; but arousable by minor stimulation			
1.b- LOC- Questions (month and age) 0- Both correct; 1- one correct; 2- none correct.	2 - None correct			
1.c- LOC - Verbal Commands (open/close eyes, grip/release non-paretic hand) 0-both tasks correctly; 1- one task correctly; 2- none task correctly.	2- None task correctly			
2- Best gaze (Only horizontal eye movements, voluntary or reflexive) 0- Normal; 1- partial gaze palsy; 2- forced deviation.	2 - Forced deviation			
3- Visual fields (stimuli or threats in each eye's 4 quadrants) 0- No visual loss; 1- partial hemianopia ; 2- complete hemianopia; 3- bilateral hemianopia (blind/cortical blindness).	2 - Complete hemianopia			
4- Facial palsy 0- Normal; 1- Right side minor paralysis; 1- Left side minor paralysis; 2- Right side partial paralysis; 2- Left side partial paralysis; 3- Right side complete paralysis; 3- Left side complete paralysis.	2 - Right side partial paralysis			
5.a- Motor Right Arm (10" sitting at 90°, supine at 45°) 0- No drift; 1- drift, drifts does not hit bed; 2- Some effort against gravity; drifts down to bed; 3- No effort against gravity, limb falls; 4- No movement; UN - amputation or join fusion.	4 - No movement			
5.b- Motor Left Arm (10" sitting at 90°, supine at 45°)	0 - No drift			
6.a- Motor Right Leg (5" lying at 30°)	4 - No movement			
6.b- Motor Left Leg (5" lying at 30°)	0 - No drift			
SEVERE LEFT HEMISPHERE ISCHEMIC STROKE	TEST	RESULT		
			7- Limb ataxia (finger-nose-finger; heel-shin) 0- Absent; 1- Present in one limb; 2- Present in two limbs; UN- amputation or join fusion.	0 - Absent
			8- Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) 0- Normal; 1- mild to moderate sensory loss; 2- Severe to total sensory loss).	2 - Severe to total sensory loss
			9- Best Language (name items, describe a picture, read sentences) 0- No aphasia; 1- mild to moderate aphasia; 2- severe aphasia; 3- mute, global aphasia.	2 - Severe aphasia

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		<p>10- Dysarthria (clarity of articulation of speech when reading or repeating words) 0- Normal; 1- mild to moderate dysarthria; 2-severe dysarthria; mute/anarthric UN-intubated or other physical barrier.</p> <p>11-Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosagnosia) 0- No abnormality; 1-Visual, tactile, auditory, spatial or personal inattention or extinction to one modality; 2- Profound hemi-inattention or extinction to more than one modality.</p> <p>Total</p>	<p>2 - Severe dysarthria; Mute/anarthric</p> <p>0 - No abnormality</p> <p>25 - Severe stroke</p>
	HEALTH CONDITIONS	TEST	RESULT
		1.a- Level of Consciousness 0- Alert, Keenly responsive; 1-Not Alert; but arousable by minor stimulation; 2- Not Alert, requires repeated and strong stimulation;- 3-coma.	2 - Not Alert, requires repeated and strong stimulation
		1.b- LOC- Questions (month and age) 0- Both correct; 1- one correct; 2- none correct.	2 - None correct
		1.c- LOC - Verbal Commands (open/close eyes, grip/release non-paretic hand) 0-both tasks correctly; 1- one task correctly; 2- none task correctly.	2- None task correctly
		2- Best gaze (Only horizontal eye movements, voluntary or reflexive) 0- Normal; 1- partial gaze palsy; 2- forced deviation.	2 - Forced deviation
		3- Visual fields (stimuli or threats in each eye's 4 quadrants) 0- No visual loss; 1- partial hemianopia ; 2- complete hemianopia; 3- bilateral hemianopia (blind/cortical blindness).	2 - Complete hemianopia
		4- Facial palsy 0- Normal; 1- Right side minor paralysis; 1- Left side minor paralysis; 2- Right side partial paralysis; 2- Left side partial paralysis; 3- Right side complete paralysis; 3- Left side complete paralysis.	3 - Right side complete paralysis
		5.a- Motor Right Arm (10" sitting at 90°, supine at 45°) 0- No drift; 1- drift, drifts does not hit bed; 2- Some effort against gravity; drifts down to bed; 3- No effort against gravity; limb falls; 4- No movement, UN - amputation or join fusion.	4 - No movement
	AFTER ALTEPLASE	5.b- Motor Left Arm (10" sitting at 90°, supine at 45°)	0 - No drift
		6.a- Motor Right Leg (5" lying at 30°)	4 - No movement
		6.b- Motor Left Leg (5" lying at 30°)	0 - No drift
		7- Limb ataxia (finger-nose-finger; heel-shin) 0- Absent; 1- Present in one limb; 2- Present in two limbs; UN- amputation or join fusion.	0 - Absent
		8- Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) 0- Normal; 1- mild to moderate sensory loss; 2- Severe to total sensory loss).	2 - Severe to total sensory loss
		9- Best Language (name items, describe a picture, read sentences) 0- No aphasia; 1- mild to moderate aphasia; 2- severe aphasia; 3- mute, global aphasia.	3 - Mute, global aphasia
		10- Dysarthria (clarity of articulation of speech when reading or repeating words) 0- Normal; 1- mild to moderate dysarthria; 2-severe dysarthria; mute/anarthric UN-intubated or other physical barrier.	2 - Severe dysarthria; Mute/anarthric
		11-Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosagnosia) 0- No abnormality; 1-Visual, tactile, auditory, spatial or personal inattention or extinction to one modality; 2- Profound hemi-inattention or extinction to more than one modality.	0 - No abnormality
		Total	28 - Severe stroke

Notes: CT = computed tomography; NIHSS = National Institutes of Health Stroke Scale

TREATMENT / INTERVENTION OPTIONS

Medication / intervention options to treat all patient's conditions.

This table contains treatments required to treat all relevant acute health conditions present in this case.

Each cell in the first column designates a condition and the cells to the right describe its treatment options.

The "type" and "category" columns refer to the location of the treatment item in Body Interact user interface (to be filled in only by the Body Interact team).

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To treat:	TYPE	CATEGORY	DESIGNATION	DOSE	UNIT	ROUTE OF ADMINISTRATION	PRIORITY
ISCHEMIC EMBOLIC LEFT STROKE / SEVERE ISCHEMIC EMBOLIC LEFT STROKE WITH ALTEPLASE CONTRAINDICATION	MEDICATION	ANTIPLATELET (ONE OF THE FOLLOWING)	Acetylsalicylic acid	100	mg	PO	1st Priority
			Acetylsalicylic acid	300	mg	RECTAL	
			Clopidogrel	75	mg	PO	
	TYPE	DESCRIPTION					PRIORITY
	CALL	Stroke Unit *	The stroke unit is notified.				1st Priority

Note:

- Firstly, verify if there are contraindications for alteplase treatment and there are Head CT alterations that constitute a contraindication.
- A patient with contraindication to alteplase should start secondary stroke prevention as soon as possible, and alteplase should not be administered as lesion is already installed, which may cause neurological worsening at this stage.
- *For Ischemic embolic stroke treatment, Call Stroke unit intervention, is an optional intervention.
- Regarding Antiplatelet treatment, preferably Acetylsalicylic acid is administered.

To treat:	TYPE	CATEGORY	DESIGNATION	DOSE	UNIT	DESCRIPTION	PRIORITY
REDUCED OXYGENATION	INTERVENTION	OXYGEN	Nasal cannula	-	-	-	2nd Priority
	INTERVENTION	OXYGEN	High flow mask	40	%	-	2nd Priority

Notes: In this case, blood pressure should not be lowered since there is no indication to alteplase.

ENDING MESSAGES

Each ending message text is required to have no more than 200 characters (including spaces).

TYPE	CONDITIONAL	MESSAGE
Success	Antiplatelet administration	Congratulations, your practice meets the guidelines' requirements.
Failure	Alteplase administration	Unfortunately your patient didn't make it. Try again!

DIFFERENTIAL DIAGNOSIS

Indication of the options of diagnostic answers that the user will be presented at the end of the simulation (multiple choice question):

DIFFERENTIAL DIAGNOSIS MULTIPLE CHOICE QUESTION	Correct answer	Ischemic stroke
	3 incorrect answers	Cerebral tumor
	Hemorrhagic stroke	
	Encephalitis	

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