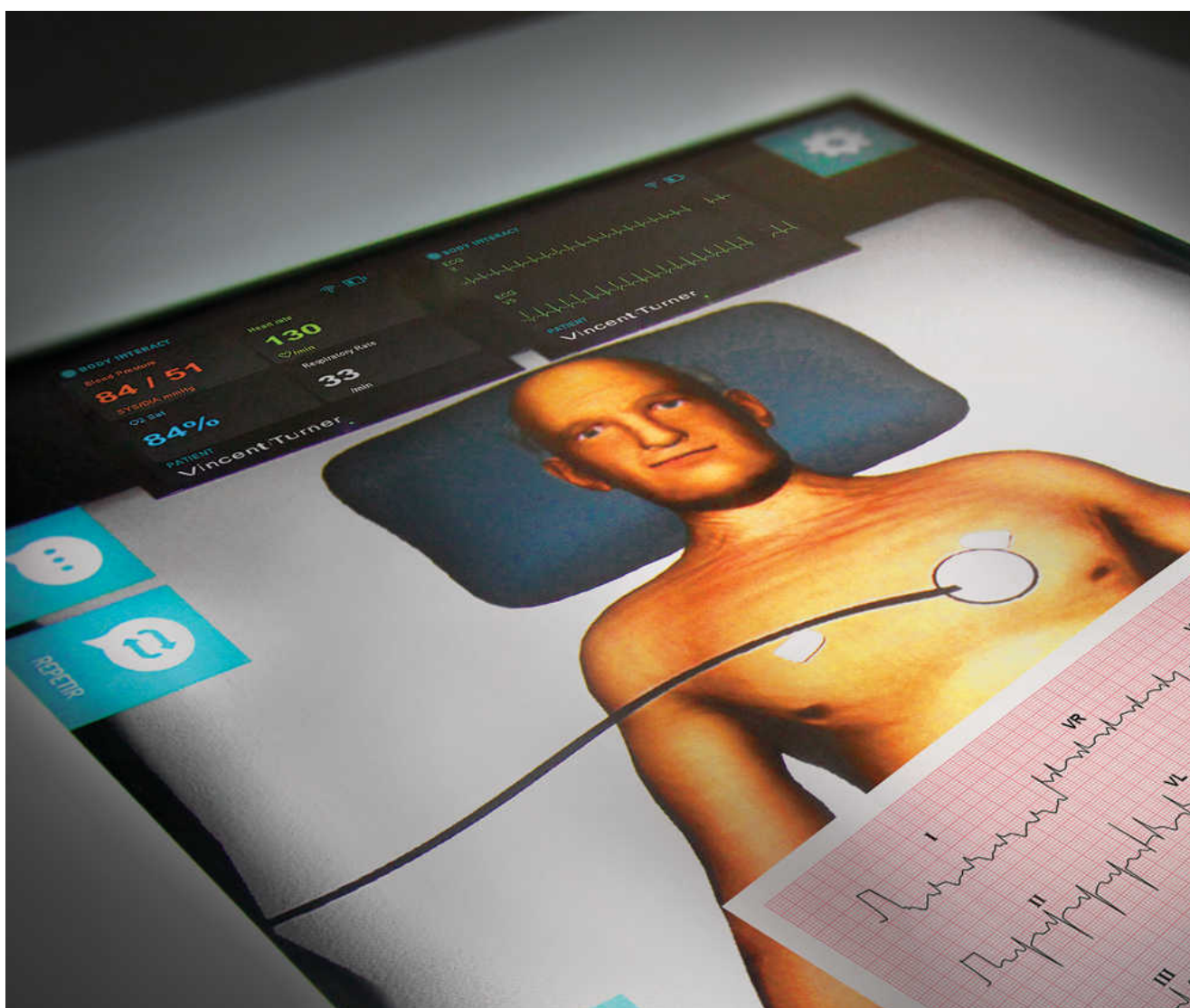


BODY INTERACT™

CLINICAL REASONING EDUCATION



SCENARIO 70 - BETHANY LARSON

MEDICAL CATEGORY: NEUROLOGY

CASE DIFFICULTY: INTERMEDIATE

SIMULATION ENVIRONMENT: EMERGENCY ROOM

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

Case 70
Bethany Larson

©2017 Take The Wind. Confidential. All rights reserved

Version: V5

Date: 21/08/2017

Body Interact v5

OVERVIEW



| | | | |
|---------------------------------|-----------------|---|--|
| CONTEXT | | Bethany was at home with her relatives when she suddenly felt less strength in her left arm. The relatives called the emergency and Bethany arrived at the hospital 1.5 hours after symptoms onset. | |
| BRIEFING | | Female patient with 78 years just arrived in the emergency room due to sudden onset of left hemiparesis 2 hours ago. | |
| LEARNING OBJECTIVES | GENERAL | Recognize acute ischemic stroke. | |
| | SPECIFIC | Knowledge of indications and contraindications to thrombolysis. Knowledge of indications and contraindications to intra-arterial treatments. Management of acute ischemic stroke. | |
| PATIENT CHARACTERIZATION | | Patient name: | Bethany Larson |
| | | BMI: | 26.6 (overweight) |
| | | Weight (kg): | 68 |
| | | Weight (lb): | 150 |
| | | Chronic conditions: | Hypertension; Diabetes mellitus type 2; Atrial fibrillation; Dyslipidemia. |
| | | Age (years): | 78 |
| | | Sex: | Female |
| | | Height (cm): | 160 |
| | | Height (in): | 63 |

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

ABCDE ASSESSMENT

| CATEGORY | PARAMETERS | EVALUATION | PRIORITY |
|--------------------|---|--|--------------|
| AIRWAY | Upper airway noises | No readily audible breath sounds. | 1st Priority |
| | Airway observation | Clear airway | 1st Priority |
| BREATHING | Signs of respiratory distress | No signs of respiratory distress. | 1st Priority |
| | Respiratory rate | 13/min | 1st Priority |
| | Chest excursion | Symmetric diaphragmatic excursion. | 1st Priority |
| | Chest deformity | No | 1st Priority |
| | O ₂ Sat | 97% | 1st Priority |
| | Chest percussion | 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 | 2nd Priority |
| | Chest palpation | 2L - normal; 2R - normal | 2nd Priority |
| | Pulmonary auscultation | Normal vesicular murmurs in all sites. | 1st Priority |
| CIRCULATION | Hands and digits | Pink and warm | 1st Priority |
| | Heart rate | 90 bpm | 1st Priority |
| | Pulse palpation | Carotid - Amplitude: strong; Rhythm: irregular; Radial - Amplitude: strong; Rhythm: irregular, equal both sides; Femoral - Amplitude: strong; Rhythm: irregular, equal both sides; Dorsalis pedis - Amplitude: strong; Rhythm: irregular, equal both sides. | 1st Priority |
| | Blood pressure | 170 / 90 mmHg | 1st Priority |
| | Capillary refill time (CRT) | 1.5 seconds | 1st Priority |
| | Heart auscultation | S1 and S2 normal sounds, no murmurs. | 1st Priority |
| | Urinary output | 0.6 mL/kg/h / 40.8 mL/h | 1st Priority |
| DISABILITY | <u>Pupils (size, equality and reaction to light)*</u> | 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 | 1st Priority |
| | Glasgow Coma Scale | 15 (E = 4; V = 5; M = 6) | 1st Priority |
| | Blood Glucose | 145 mg/dL / 8 mmol/L | 1st Priority |
| | Full body* | Front: No visible alterations. | 2nd Priority |

Case 70
Bethany Larson

©2017 Take The Wind. Confidential. All rights reserved

Version: V5

Date: 21/08/2017

Body Interact v5

| | | | |
|-----------------|------------------------|--|---------------------|
| EXPOSURE | <u>Full body</u> | Back: No visible alterations. | 2nd Priority |
| | Abdominal auscultation | Normal hydro-aerial sounds without abdominal murmurs. | 2nd Priority |
| | Abdomen palpation | No rigidity. No pain. No visceromegaly. | 2nd Priority |
| | Abdomen percussion | 6R - tympanic; 7R - tympanic; 6L - tympanic; 7L - tympanic | 2nd Priority |
| | Temperature | 36 °C / 97 °F | 1st Priority |

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

DIALOGUES

Specification of dialogues with the patient during simulation:

| CATEGORY | Question Availability | # | QUESTION | PATIENT REPLY | REPLY CONDITIONAL | PRIORITY |
|--------------------------|---------------------------|----|---|---|-------------------|---------------------|
| Medical condition | - | 1 | What happened to you? | I suddenly had difficulty moving my left body. | - | 1st Priority |
| | After question 1 is asked | 2 | When did your symptoms start? | Two hours ago. | - | 1st Priority |
| | - | 3 | Do you feel pain? | No, I don't. | - | 2nd Priority |
| | - | 4 | Did you have any recent surgery? | No. | - | 1st Priority |
| | - | 5 | Do you have any other diseases? | I have atrial fibrillation. | - | 2nd Priority |
| | - | 6 | Did you have any severe illness or injury before? | One year ago I suffered a transient ischemic attack. | - | 2nd Priority |
| | - | 7 | Did you fall? | No. | - | 2nd Priority |
| | - | 8 | Do you have any allergies? | Ahm... no... | - | 2nd Priority |
| Medication | - | 9 | Do you take any medication? | Yes, I am taking candesartan 8 mg daily, warfarin daily, pravastatin 40 mg daily, metformin 1000 mg twice daily, and bisoprolol 5 mg daily. | - | 1st Priority |
| | - | 10 | Have you been taking your medication properly? | Yes. Well... a week ago I stopped taking warfarin for a tooth extraction, but I have restarted it 6 days ago. | - | 2nd Priority |
| Nutrition | - | 11 | What do you usually eat? | I eat everything. We cook very good meals at home. | - | Not a Priority |
| | - | 12 | How many meals per day? | I have three meals a day. | - | Not a Priority |
| | - | 13 | Do you eat snacks in between meals? | No. I don't usually eat snacks. | - | Not a Priority |
| | - | 14 | Do you take dietary supplements? | No, I am only taking my medication. | - | Not a Priority |
| | - | 15 | Have you felt any appetite changes? | I think my appetite has been the same. | - | Not a Priority |
| Risk factors | - | 16 | What is your job? | I am retired. | - | Not a Priority |
| | - | 17 | Have you been under stress lately? | It depends on the day. | - | Not a Priority |
| | - | 18 | Do you have high blood pressure? | Yes, I have high blood pressure. | - | 2nd Priority |
| | - | 19 | Do you have high cholesterol? | Yes, I'm afraid so. | - | 2nd Priority |
| | - | 20 | Do you drink alcoholic beverages frequently? | No. | - | Not a Priority |
| | - | 21 | Do you smoke? | No, I don't. | - | Not a Priority |

Case 70
Bethany Larson

©2017 Take The Wind. Confidential. All rights reserved

Version: V5

Date: 21/08/2017

Body Interact v5

INITIAL SIMULATION CONDITIONS

| CATEGORY | DESIGNATION | COMMENTS |
|--------------------------------|--|------------------------------|
| Signs & symptoms | Mouth deviation towards the right side | Due to stroke |
| Acute conditions at case start | Acute ischemic stroke of right MCA | - |
| | Hypocoagulation with Warfarin | - |
| Parameters at case start: | Blood pressure (mmHg): 170 / 90 | |
| | Heart rate (bpm): 90 | |
| | Respiratory rate (/min): 13 | |
| | O ₂ saturation (%): 97 | |
| | Blood glucose (mg/dL): 145 | Blood glucose (mmol/L): 8.05 |
| | Temperature (°C): 36.0 | Temperature (°F): 97 |
| | Hemoglobin (g/dL): 13.1 | |
| | Urinary output (mL/kg/h): 0.6 | |

SEQUENCING OF CLINICAL CONDITIONS

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

| SIMULATION TIME (MIN) | EVENT |
|-----------------------|---|
| 0 | Initial conditions: Acute ischemic stroke of right MCA leads to a O ₂ saturation change by -1%/min Hypocoagulation with Warfarin |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | Hypoxia (O ₂ saturation < 90%); Hypoxia leads to Asymptomatic mild tachycardia (HR: 110 bpm) and Asymptomatic mild tachypnea (RR: 28 / cycles) |
| 9 | |
| 10 | |
| 11 | |
| 12 | Acute ischemic stroke leads to severe acute ischemic stroke which leads to a O ₂ Saturation change by - 1.5 % / min |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | Severe Hypoxia (O ₂ saturation < 80%); Severe Hypoxia leads to Severe Tachycardia (HR: 150 bpm) and Severe Tachypnea (RR: 39 /cycles) |
| 18 | Severe Hypoxia leads to Unconsciousness |
| 19 | |
| 20 | |

Note: If thrombolysis is administered, patient deteriorates to coma with respiratory arrest. After 2 minutes of unassisted coma with respiratory arrest the patient dies

EXAMINATION PROCEDURES

Examination procedures relevant for the case with detailed results:

| CATEGORY | TEST NAME | CONDITIONAL | RESULT DESCRIPTION | |
|----------|--------------------|----------------|--|---|
| | Lung auscultation | Initial | Normal vesicular murmurs in all sites. | |
| | | Cardiac Arrest | Silent | |
| | Heart auscultation | Initial | S1 and S2 normal sounds, no murmurs. | |
| | | Cardiac Arrest | Silent | |
| | Pulse palpation | Initial | | Carotid - Amplitude: strong; Rhythm: irregular; |
| | | | | Radial - Amplitude: strong; Rhythm: irregular, equal both sides; Femoral - Amplitude: strong; Rhythm: irregular, equal both sides; Dorsalis pedis - Amplitude: strong; Rhythm: irregular, equal both sides. |

Case 70
Bethany Larson

©2017 Take The Wind. Confidential. All rights reserved

Version: V5

Date: 21/08/2017

Body Interact v5

| | | | | | |
|-----------------|--|---|--|-------------------------------------|--------|
| Physical exam | Capillary refill time (CRT) | Cardiac Arrest | Carotid - Amplitude: absent; Radial - Amplitude: absent; Femoral - Amplitude: absent; Dorsalis pedis - Amplitude: absent. | | |
| | | Initial | 1.5 seconds | | |
| | | Cardiac Arrest | No perfusion | | |
| | Glasgow coma scale | Acute right ischemic stroke OR Intervention Neuroradiologist is performed | TEST | | RESULT |
| | | | Eye opening | 4 | |
| | | | Verbal response | 5 | |
| | | | Motor response | 6 | |
| | | | Total result | 15 - No impairment of consciousness | |
| | | | TEST | | RESULT |
| | | Eye opening | 3 | | |
| | | Verbal response | 4 | | |
| | | Motor response | 5 | | |
| | | Total result | 12 - Moderate impairment of consciousness | | |
| | | If thrombolysis is administered | TEST | | RESULT |
| | | | Eye opening | 2 | |
| Verbal response | 3 | | | | |
| Motor response | 3 | | | | |
| Total result | 8 - Severe impairment of consciousness | | | | |

DIAGNOSTIC STRATEGIES

Complementary strategies for diagnosis relevant for the case:

| CATEGORY | TEST NAME | RESULT DESCRIPTION | PRIORITY | |
|---|-----------------------------------|--|--|---|
| Imaging | Head CT | Initial | A spontaneous hyperdensity is visible in the whole M1 segment of the right middle cerebral artery suggesting the presence of an intravascular thrombus. No acute lesions are visible. Mild calcifications are visible in the carotid siphons. ASPECTS: 10 | |
| | | Hemorrhagic Transformation | A large intracerebral hematoma is visible in the right basal ganglia and adjacent insular cortex and corona radiata with nearby subarachnoid hemorrhage in the right frontal and parietal lobes, and tetraventricular hemorrhage. It has significant mass effect over the nearby structures causing midline shift, transtentorial and subfalciform herniation. No other acute lesions are visible. | |
| | Angio CT | Occlusion of M1 segment of the right middle cerebral artery. Pial collateral circulation is visible in distal middle cerebral artery branches. | | |
| | CT perfusion | Large area of cerebral blood flow impairment and increase in mean transit time in the whole territory of the right middle cerebral artery. | | |
| | Transcranial Doppler | M1 Right Occlusion | | |
| Lab tests | Coagulation Tests | INR: 3.5 | | |
| | Lipid profile | Dyslipidemia | | |
| Electrophysiology | 12-Lead ECG | Atrial fibrillation | | |
| Decision aids | Stroke Scale (NIHSS) | Acute right ischemic stroke | TEST | |
| | | | RESULT | |
| | | | 1.a - Level of Consciousness | 0 - Alert, Keenly responsive |
| | | | 1.b- LOC - Questions (month and age) | 0 - Both correctly |
| | | | 1.c- LOC - Verbal Commands (open/close eyes, grip/release non-paretic hand) | 0 - Both tasks correctly |
| | | | 2 - Best gaze (Only horizontal eye movements, voluntary or reflexive) | 0 - Normal |
| | | | 3 - Visual fields (stimuli or threats in each eye's 4 quadrants) | 0 - No visual loss |
| | | | 4 - Facial palsy | 1 - Left side minor paralysis |
| | | | 5.a - Motor Right Arm (10" sitting at 90°, supine at 45°) | 0 - No drift |
| | | | 5.b - Motor Left Arm (10" sitting at 90°, supine at 45°) | 2 - Some effort against gravity; Drifts down to bed |
| | | | 6.a - Motor Right Leg (5" lying at 30°) | 0 - No drift |
| | | | 6.b - Motor Left Leg (5" lying at 30°) | 1 - Drift, drifts does not hit bed |
| | | | 7- Limb ataxia (finger-nose-finger; heel-shin) | 0 - Absent |
| 8 - Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) | 1 - Mild to moderate sensory loss | | | |
| 9 - Best Language (name items, describe a picture, read sentences) | 0 - No aphasia | | | |
| 10 - Dysarthria (clarity of articulation of speech when reading or repeating words) | 0 - Normal | | | |

Case 70
Bethany Larson

©2017 Take The Wind. Confidential. All rights reserved

Version: V5

Date: 21/08/2017

Body Interact v5

| | | TEST | RESULT |
|---|---|---|---|
| Intervention Neuroradiologist is performed | 11 -Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosognosia) | | 2 - Profound hemi-inattention or extinction to more than one modality |
| | Total | | 7 - Moderate stroke |
| | | TEST | RESULT |
| | 1.a - Level of Consciousness | | 0 - Alert, Keenly responsive |
| | 1.b- LOC - Questions (month and age) | | 0 - Both correctly |
| | 1.c- LOC - Verbal Commands (open/close eyes, grip/release non-paretic hand) | | 0 - Both tasks correctly |
| | 2 - Best gaze (Only horizontal eye movements, voluntary or reflexive) | | 0 - Normal |
| | 3 - Visual fields (stimuli or threats in each eye's 4 quadrants) | | 0 - No visual loss |
| | 4 - Facial palsy | | 1 - Left side minor paralysis |
| | 5.a - Motor Right Arm (10" sitting at 90°, supine at 45°) | | 1 - Drift, drifts does not hit bed |
| | 5.b - Motor Left Arm (10" sitting at 90°, supine at 45°) | | 0 - No drift |
| | 6.a - Motor Right Leg (5" lying at 30°) | | 0 - No drift |
| | 6.b - Motor Left Leg (5" lying at 30°) | | 0 - No drift |
| | 7- Limb ataxia (finger-nose-finger; heel-shin) | | 0 - Absent |
| | 8 - Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) | | 1 - Mild to moderate sensory loss |
| | 9 - Best Language (name items, describe a picture, read sentences) | | 0 - No aphasia |
| | 10 - Dysarthria (clarity of articulation of speech when reading or repeating words) | | 0 - Normal |
| | 11 -Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosognosia) | | 0 - No abnormality |
| | Total | | 3 - Minor stroke |
| Severe right acute ischemic stroke | | TEST | RESULT |
| | 1.a - Level of Consciousness | | 1 - Not Alert; but arousable by minor stimulation |
| | 1.b- LOC - Questions (month and age) | | 1 - One correctly |
| | 1.c- LOC - Verbal Commands (open/close eyes, grip/release non-paretic hand) | | 1 - One task correctly |
| | 2 - Best gaze (Only horizontal eye movements, voluntary or reflexive) | | 1 - Partial gaze palsy |
| | 3 - Visual fields (stimuli or threats in each eye's 4 quadrants) | | 2 - Complete hemianopia |
| | 4 - Facial palsy | | 2 - Left side partial paralysis |
| | 5.a - Motor Right Arm (10" sitting at 90°, supine at 45°) | | 0 - No drift |
| | 5.b - Motor Left Arm (10" sitting at 90°, supine at 45°) | | 4 - No movement |
| | 6.a - Motor Right Leg (5" lying at 30°) | | 0 - No drift |
| | 6.b - Motor Left Leg (5" lying at 30°) | | 3 - No effort against gravity, limb falls |
| | 7- Limb ataxia (finger-nose-finger; heel-shin) | | 1 - Present in one limb |
| | 8 - Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) | | 2 - Severe to total sensory loss |
| 9 - Best Language (name items, describe a picture, read sentences) | | 0 - No aphasia | |
| 10 - Dysarthria (clarity of articulation of speech when reading or repeating words) | | 1 - Mild to moderate dysarthria | |
| 11 -Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosognosia) | | 0 - No abnormality | |
| Total | | 19 - Moderate to severe stroke | |
| If thrombolysis is administered | | TEST | RESULT |
| | 1.a - Level of Consciousness | | 3 - Coma |
| | 1.b- LOC - Questions (month and age) | | 2 - None correctly |
| | 1.c- LOC - Verbal Commands (open/close eyes, grip/release non-paretic hand) | | 2 - Neither task correctly |
| | 2 - Best gaze (Only horizontal eye movements, voluntary or reflexive) | | 2 - Forced deviation |
| | 3 - Visual fields (stimuli or threats in each eye's 4 quadrants) | | 3 - Bilateral hemianopia (blind/cortical blindness) |
| | 4 - Facial palsy | | 3 - Left side complete paralysis |
| | 5.a - Motor Right Arm (10" sitting at 90°, supine at 45°) | | 4 - No movement |
| | 5.b - Motor Left Arm (10" sitting at 90°, supine at 45°) | | 4 - No movement |
| | 6.a - Motor Right Leg (5" lying at 30°) | | 4 - No movement |
| | 6.b - Motor Left Leg (5" lying at 30°) | | 4 - No movement |
| | 7- Limb ataxia (finger-nose-finger; heel-shin) | | 2 - Present in two limbs |
| | 8 - Sensory (sensation to pinprick when tested or withdrawal from noxious stimulus) | | 2 - Severe to total sensory loss |
| 9 - Best Language (name items, describe a picture, read sentences) | | 3 - Mute, global aphasia | |
| 10 - Dysarthria (clarity of articulation of speech when reading or repeating words) | | 2 - Severe dysarthria; Mute/anarthric | |
| 11 -Extinction and inattention (simultaneous bilateral visual and tactile stimuli; anosognosia) | | 2 - Profound hemi-inattention or extinction to more than one modality | |
| Total | | 42 - Severe stroke | |

1st Priority

Notes: CT = computed tomography; NIHSS = National Institutes of Health Stroke Scale
*In the current application version, these tests are not implemented yet.

Case 70
Bethany Larson

©2017 Take The Wind. Confidential. All rights reserved

Version: V5

Date: 21/08/2017

Body Interact v5

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).

| To treat: | TYPE | CATEGORY | DESCRIPTION | PRIORITY |
|--|------|-------------------------------|--|--------------|
| ACUTE ISCHEMIC STROKE / SEVERE ACUTE ISCHEMIC STROKE | CALL | STROKE UNIT | The stroke unit is notified. | 1st Priority |
| | | Intervention Neuroradiologist | The Intervention Neuroradiologist is notified. | 1st Priority |

Note: For Ischemic stroke treatment, Call Stroke unit intervention, is an optional intervention.

| To treat: | TYPE | CATEGORY | DESIGNATION | DOSE | UNIT | ROUTE OF ADMINISTRATION | PRIORITY |
|--------------------------|--------------|-------------|----------------------|---|--------|-------------------------|----------------|
| HYPOXIA / SEVERE HYPOXIA | INTERVENTION | OXYGEN | Nasal cannula | 2 | L /min | - | Not a Priority |
| | | | High flow mask | 40 | % | - | Not a Priority |
| | | VENTILATION | DESIGNATION | DESCRIPTION | | PRIORITY | |
| | | | Invasive Ventilation | Orotracheal tube is placed and ventilator is turned on. | | Not a Priority | |

| To treat: | TYPE | CATEGORY | DESIGNATION | DESCRIPTION | PRIORITY |
|-----------|--------------|-------------|------------------------------|--|----------------|
| APNEA | INTERVENTION | VENTILATION | Orotracheal tube+ventilation | Placement of oro tracheal tube+ventilation | Not a Priority |

| To treat: | TYPE | CATEGORY | DESIGNATION | DESCRIPTION | PRIORITY | |
|--------------------------|--------------|------------------|------------------------------|--|----------------|----------|
| ASYSTOLIC CARDIAC ARREST | INTERVENTION | VENTILATION | Orotracheal tube+ventilation | Placement of oro tracheal tube+ventilation | Not a Priority | |
| | | LIFE SUPPORT | Chest compressions | 100 compressions / min | Not a Priority | |
| | MEDICATION | VASOACTIVE AGENT | Adrenaline | 1 | mg | IV bolus |

ENDING MESSAGES

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

| TYPE | CONDITIONAL | MESSAGE |
|---------|---|--|
| Success | Treating the patient's conditions according to guidelines | Congratulations, your practice meets the guidelines' requirements. |
| Failure | Thrombolysis administered in spite of contraindication | The case was not solved according to the guidelines' requirements. |
| | Patient suffered a cardiac arrest and was not resuscitated. | 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 | Multiple Sclerosis |
| | | Brain tumor |
| | | Epileptic fit |

REFERENCES

1. Committee TESO (ESO) EC and the EW. Guidelines for Management of Ischaemic Stroke and Transient Ischaemic Attack 2008. CED. 2008;25(5):457-507.
2. Powers WJ, Derdeyn CP, Biller J, et al. 2015 American Heart Association/American Stroke Association Focused Update of the 2013 Guidelines for the Early Management of Patients With Acute Ischemic Stroke Regarding Endovascular Treatment. Stroke. 2015;46(10):3020-3035.
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.
4. Jauch EC, Saver JL, Adams HP, et al. Guidelines for the Early Management of Patients With Acute Ischemic Stroke. Stroke. 2013;44(3):870-947.