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STROKE SIMULATION SCENARIOS



SCENARIO 1: Suspected Ischemic Stroke without Large Vessel Occlusion

Prehospital

Actors:

- Patient: 68 y/o female
- Husband: approximately same age
- 911 Dispatcher
- Engine Company (3): Firefighter/EMT, Driver Engineer, Lieutenant
- ALS Ambulance crew (2): paramedics

A sixty-eight year-old female patient has a sudden onset of left-sided weakness and slurred speech.

This 68 y/o patient with a history of hypertension develops a sudden onset of slurred speech while watching television in her home. Her husband recognizes her abnormal speech, and asks her what is wrong. He then realizes that the left side of her mouth seems to be drooping slightly when she tries to speak. He reassures her, then immediately calls 911.

The Emergency Medical Dispatch (EMD) trained call taker establishes the scene location, level of consciousness, and the onset history, and then asks a series of more specific questions:

- **Does the person's speech sound normal?** *No.*
- **Does the person have weakness or paralysis on one side of the body?** *Not sure.*
- **Does the person have a facial droop?** *Yes.*
- **Does the person have a headache?** *No.*
- **Has the person ever had a stroke before?** *No.*

Setting:

- Residential home

An emergent response for a possible stroke is initiated with both an engine company and Advanced Life Support (ALS) being dispatched to the address. The husband is told to keep his wife calm, secure any pets, and to call back if there are any changes. Help will be there soon.

The fire department engine company arrives within five minutes of being dispatched. They establish scene safety, pull their equipment and approach the front door of the residential home. The husband, greets them at the door, "please hurry!" The crew enters into the living area and forms a general impression as they approach the patient. She is conscious with good color, and is watching them enter. They engage contact with the patient completing the initial assessment: establishing that she's alert with a patent airway, is breathing adequately, and has a strong regular pulse. Her skin is warm and dry. The engine company EMT notes that the patient has a slight left facial droop and begins the assessment.



SCENARIO 1: Suspected Ischemic Stroke without Large Vessel Occlusion *continued*

While the EMT begins her assessment of the patient, the engine lieutenant takes the husband into the kitchen, and asks about the onset, her medical history (only hypertension), current medications (only captopril), and other pertinent information (NKDA).

The EMT places the patient on pulse oximetry and notes it to be 96% saturation. The patient (through somewhat slurred speech) tells the EMT that after dinner everything was fine and then, while watching TV a short time later, she started to feel “funny”. The EMT asks precisely what time this occurred, and begins to perform the **Cincinnati Prehospital Stroke Scale (CPSS)** to determine if patient is suspected for having an acute stroke. The Last Known Well (LKW) time which was 25 minutes ago is documented.

As he’s doing this, the paramedics arrive and greet the engine company. The paramedic assists the EMT in the performance of the Cincinnati Prehospital Stroke Scale (CPSS):

Facial Droop

Abnormal: Left side of facial droop, right side normal

Arm Drift

Abnormal: Left arm drifts slightly, right side normal

Speech

Abnormal: The patient’s speech is coherent, but somewhat slurred.

As this occurs and the lieutenant reports the historical information from the husband, the second paramedic initiates the focused history and physical exam and obtains vital signs: pulse: 88, respiratory rate: 16 (no airway obstruction), blood pressure: 168/90 and SpO₂: still 96. She then applies the electrodes for the cardiac monitor (Sinus Rhythm), and assesses breath sounds. Continuing the assessment, the first paramedic notes a decreased grip with the patient’s left hand.

A decision is made to assess the patient’s glucose, and perform the **Los Angeles Motor Scale (LAMS)** to assess for potential Large Vessel Occlusion (LVO).

Facial Droop

Present = 1

Arm Drift

Drifts down = 1

Grip Strength

Weak grip = 1

The patient has a score of 3 on the LAMS screen which does not meet this agency’s threshold for suspected LVO. The agency has set a threshold score of equal or greater than 4 as a suspected LVO. The patient’s blood glucose is noted to be 106 mg/dl.

As the Last Known Well (LKW) time was established to be well within time parameters and the screen did not indicate a suspected LVO, the paramedic alerts the nearby Primary Stroke Center (PSC) hospital that they will be inbound with a Stroke Alert with an ETA 17 minutes.

The patient is positioned onto the stretcher with her head slightly elevated due to facial weakness and high risk of aspiration, and loaded into the ambulance. Just prior to transport, blood samples are obtained and a large bore IV is established. As this occurs, the husband secures the home and is loaded into the front seat of the ambulance with the patient’s health and insurance information. Though the husband is traveling with the ambulance, his cell phone number is obtained and documented.

The patient is transported to the PSC. While en route, a second large bore IV is established and the patient is reassessed with no changes. A more comprehensive report is communicated to the hospital during the transport.

Upon arrival at the emergency department, the crew is greeted by the ED stroke team and expedited to care.



SCENARIO 1: Suspected Ischemic Stroke without Large Vessel Occlusion *continued*

Hospital

Actors:

- Patient: 68 y/o female
- Husband: approximately same age
- Emergency Department Staff
- Radiology Staff
- Pharmacy
- Lab Staff
- Stroke Team

Patient enters emergency room on EMS gurney accompanied by family and EMS Crew. Patient and EMS greeted at ambulance door by ED Physician for initial evaluation to determine if patient is stable for direct transport to CT and VS collected. Hospital stroke alert called and Stroke Team notified of patient arrival by ED Staff. EMS report and handoff given to Emergency Room Staff. Patient registration collects information from family and EMS to initiate quick registration process. ED physician orders facility's AIS protocol. Blood glucose is checked and labs ordered. Patient is brought directly to CT scanner by EMS Crew and ED Nurse. Stroke Team meets patient at CT scanner to evaluate for hemorrhage by obtaining rapid non contrast head CT. The neurologist performs stroke exam and stroke team obtains an NIHSS of 5. Patient is transferred onto the scanner. As patient is positioned on table, EMS gives report to Stroke

Setting:

- Emergency Department
- CT Scanner

Team. Neurologist interprets the scan as the patient is scanned. CT scan is negative for bleed and Alteplase Protocol is ordered and initiated. Patient approximate weight is obtained and pharmacy notified for dosing. Patient is transferred from CT table onto hospital bed and moved to ED room. Patient is connected to monitors. 12-lead ECG completed at bedside. Lab personnel at bed side to draw labs. Stroke team completes their examination and reviews thrombolytic checklist. Alteplase arrives at bedside and initial bolus pushed and infusion started. Patient is monitored per facility's Alteplase protocol. Patient is not an EVT candidate due to low suspicion of LVO based on neurological exam and NIHSS of 5 and is admitted under the facility's AIS Post Alteplase protocol.

Scenario Ends



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STROKE SIMULATION SCENARIOS



SCENARIO 2: Suspected Stroke with Large Vessel Occlusion

Prehospital

Actors:

- Patient: 55 y/o male
- Wife: approximately same age
- 911 Dispatcher
- Engine Company (3): Firefighter/EMT, Driver Engineer, Lieutenant
- ALS Ambulance crew (3): (2) paramedics, (1) paramedic student

A 55 y/o male patient develops an onset of aphasia and right hemiplegia.

A woman arrives at home after being out shopping to find her 55 year-old husband sitting on his reclining chair with a look of frustration and panic on his face. When she asks him what is wrong, he is unable to answer her. His face reddens as he tries to form words. He then looks down with a look of resignation. She quickly calls 911.

The Emergency Medical Dispatch (EMD) trained call taker establishes the scene location, level of consciousness, what is known about the onset history, and then asks a series of more specific questions: **Does the person's speech sound normal?** *He can't speak at all! That's why I called!*

- **Does the person have weakness or paralysis on one side of the body?** *He is leaning somewhat to one side.*
- **Does the person have a facial droop?** *Yes.*
- **Does the person have a headache?** *I don't know.*
- **Has the person ever had a stroke before?** *No.*

Setting:

- Residential home

A stroke response is initiated with both an engine company and an Advanced Life Support (ALS) ambulance being dispatched to the address. The wife is told to keep her husband calm, secure any pets, and to call back if there are any changes. Help will be there soon.

The fire department engine and rescue (ALS ambulance) arrive at the same time within 7 minutes of the 911 call. They ensure scene safety, and advance into the home with their equipment. A neighbor greets them at the door and says "He won't say anything". The crew enters the home and forms a general impression. The patient is an overweight male in his 50s, seated in a chair with poor posture and his eyes open. The paramedics engage with the patient and begin their initial assessment. The patient is conscious and makes eye contact, though his gaze seems deviated to the left, he has a patent airway, and appears to be breathing adequately. His radial pulse is strong and irregular. His skin is warm and dry. He is placed on pulse oximetry (94%) and his lung sounds are assessed. Oxygen is administered via



SCENARIO 2: Suspected Stroke with Large Vessel Occlusion *continued*

nasal cannula at 2 liters per minute. He is placed on the monitor which displays atrial brillation with a rate of 92. The paramedics attempt to communicate with the patient who closes his eyes in frustration. He does strain to make eye contact and appears to understand the situation. It is noted that the patient is only moving his left hand. His right arm appears completely limp at his side. A glucose finger stick is performed and reveals a blood sugar level of 130 mg/dl.

The paramedics perform the **Cincinnati Prehospital Stroke Scale (CPSS)** to identify if patient is suspected of having a stroke.

Facial Droop
Not apparent

Arm Drift
Abnormal: Patient apparently cannot move his right arm at all

Speech
Abnormal: The patient is aphasic, unable to speak at all.

While the paramedics are assessing the patient, the wife is interviewed. She is not sure when this happened as he was fine when she left, which was more than two hours ago. The lieutenant does her best to try to narrow the onset time. "Did you speak with him as you left the house?" "Yes." "Did he seem normal then?" "Yes..." "Are you sure it was approximately two hours ago?" "Well, actually, I left after 8:00 because I remember he was watching *Good Morning Augusta...* so that was only two hours from now..." His only medical history is atrial brillation and gall stones. His only medication is digoxin. He has NKDA.

A decision is made to perform and score the **Field Assessment for Stroke Triage Emergency Destination (FAST-ED)** exam to assess for potential Large Vessel Occlusion (LVO).

Facial Palsy
Not Present = 0

Arm Weakness
No effort against gravity = 2

Speech Changes
Mute = 2

Eye Deviation
Partial = 1

Denial/Neglect
None = 0

As the patient's FAST-ED score is 5, the threshold is met for a suspected large vessel occlusion. A stroke alert is called at the Comprehensive Stroke Center (CSC). The crew will have a 25 minute ETA, bypassing the closer PSC.

The patient is positioned onto the stretcher with his head at, and loaded into the ambulance. Just prior to transport, blood samples are obtained and a large bore IV is established. As this occurs, the wife secures the home and is loaded into the front seat of the ambulance with the patient's health and insurance information. Though the patient's wife is traveling with the ambulance, her cell phone number is obtained and documented.

The patient is transported to the CSC. While en route, a second large bore IV is established and the patient is reassessed with no changes. A more comprehensive report is communicated to the hospital during the transport.

Upon arrival at the CSC's emergency department, the crew is greeted by the ED stroke team and expedited to care.



SCENARIO 2: Suspected Stroke with Large Vessel Occlusion *continued*

Hospital

Actors:

- Patient: 55 y/o male
- Wife: approximately same age
- Emergency Department Staff
- Radiology Staff
- Pharmacist
- Lab Staff
- Stroke Team
- EVT Team

Patient enters emergency room on EMS gurney accompanied by family and EMS Crew. Patient and EMS greeted at ambulance door by ED Physician for initial evaluation to determine if patient is stable for direct transport to CT, Stroke Severity Scale positive for LVO and VS stable. Patient is connected to monitors. Hospital stroke alert called. Stroke Team and EVT Team notified of patient arrival by ED Staff. EMS report and handoff given to Emergency Room Staff. Patient registration collects information from family and EMS to initiate quick registration process. ED physician orders facility's AIS Protocol. Blood glucose is checked and labs ordered. Patient is brought directly to CT scanner by EMS Crew and ED Nurse. Stroke team meets patient at CT and neurologist performs stroke exam and nurse obtains NIHSS of 14. Patient is transferred onto the scanner. As patient is positioned on table, EMS gives report to Stroke Team. Neurologist interprets the scan as the patient is scanned. CT scan is negative for bleed and Alteplase Protocol is ordered

Setting:

- Emergency Department
- CT Scanner
- Cath Lab

and initiated. Patient approximate weight is obtained and pharmacy notified for dosing. Stroke team completes their examination and reviews thrombolytic checklist. As Alteplase is prepared, patient is prepped for CTA. Completed CTA indicated a proximal occlusion of the Left Middle Cerebral Artery. Patient is transferred from CT table onto hospital bed and moved to Cath Lab. 12-lead ECG completed at bedside in Cath Lab holding area. Lab personnel at bed side to draw labs. EMS drawn blood samples were handed to Lab personnel. Lab personnel confirms tubes were properly labeled and the chain of custody was not interrupted and no visible signs of hemolysis. Tubes brought to lab for testing. Alteplase arrives at bedside and initial bolus pushed and infusion started. Door to needle time less than 45 minutes. Patient is monitored per facility's Alteplase protocol. EVT Team at bedside and initiates EVT Protocol.

Scenario Ends



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SCENARIO 3: Suspected Stroke with Emerging Large Vessel Occlusion

Prehospital

Actors:

- Patient: 77 y/o male
- Pharmacy personnel (2)
- 911 Dispatcher
- ALS Ambulance crew (3): (2) paramedics, (1) paramedic student

A 77 y/o male patient develops numbness in the right side of his face and his right arm and leg while waiting on his prescription to be filled.

The pharmacy staff is alerted by bystanders when this 77 y/o customer complains of a sudden loss of sensation on the left side of his body. The pharmacist and store manager are summoned over and recognize the potential medical emergency. A third store employee is asked to call 911. She does so from a different location within the store, and can provide only very limited information to the 911 call taker: the patient is weak, but conscious and alert.

Setting:

- Pharmacy

An Advanced Life Support (ALS) ambulance is dispatched to an “unknown medical” at the pharmacy with two paramedics. While the ambulance is in route, the pharmacist engages with the patient and asks the technician to pull the patient’s medication list. The patient is alert, and oriented with slow, deliberate speech. He said he felt the need to sit down when his right foot and leg “went numb”. He reports he feels the numbness in his right arm and on the right side of his face.

The ambulance arrives with 10 minutes. The paramedics approach the patient and form a general impression: an elderly male sitting upright who is conscious and apparently alert.



SCENARIO 3: Suspected Stroke with Emerging Large Vessel Occlusion *continued*

One paramedic begins his assessment while the other receives a good report from the pharmacist. The paramedic assessing the patient notes that he has a good airway, is breathing normally, and has a strong but slow radial pulse with warm, dry skin. The patient tells the paramedic he was fine except for a headache, then developed this numbness in his foot and leg about 20 minutes ago that was so profound he could no longer stand. A pulse oximetry is placed on the patient (SpO₂ 97%) and he is placed on the cardiac monitor (sinus rhythm with rate of 60). The patient's blood pressure is assessed (166/100) as the patient is interviewed. His lung sounds are clear. The paramedic asks precisely what time this occurred, and begins to perform the **Cincinnati Prehospital Stroke Scale (CPSS)** to determine if patient is suspected for having an acute stroke:

Facial Droop
Not apparent

Arm Drift
Abnormal: The patient's right arm drifts down slightly

Speech
Normal: The patient's speech is coherent, no slurring, but slow and deliberate.

A blood glucose sample is obtained and reveals the patient's glucose is 112. The patient states that he has a medical history that includes a heart attack 12 years ago, type 2 diabetes, and hypertension. His medications include glyburide and metoprolol. The patient states the headache began about two hours ago, but he had no numbness until he arrived at the pharmacy. The patient's wife's cell phone number is obtained and documented.

A decision is made to perform the **Los Angeles Motor Scale (LAMS)** to assess for potential Large Vessel Occlusion (LVO).

Facial Droop
Present = 0

Arm Drift
Drifts down = 1

Grip strength
Weak grip = 1

As the Last Known Well (LKW) time was established to be well within time parameters and the screen did not indicate a suspected LVO, the paramedic alerts the nearby Primary Stroke Center (PSC) hospital that they will be inbound with a Stroke Alert with an ETA 12 minutes.

The patient is positioned onto the stretcher with his head at, and loaded into the ambulance. Just prior to transport, blood samples are obtained and a large bore IV is established.

The patient is transported to the PSC. While in route, a second large bore IV is established and the patient is reassessed with some decreased right arm strength noted. A more comprehensive report is communicated to the hospital during the transport. Upon arrival to the ED, the patient seems to be slurring his words.



SCENARIO 3: Suspected Stroke with Emerging Large Vessel Occlusion *continued*

Hospital

Actors:

- Patient: 77 y/o male
- Emergency Department Staff
- Radiology Staff
- Pharmacy
- Lab Staff
- Stroke Team
- EMS Team – Interfacility transport
- EVT Team – At receiving facility (CSC)

Patient enters emergency room on EMS gurney accompanied by family and EMS Crew. Patient and EMS greeted at ambulance door by ED Physician for initial evaluation to determine if patient is stable for direct transport to CT. EMS report and handoff given to Emergency Room Staff. EMS states they noticed a worsening of the patient's symptoms during transport but did arrive at ED prior to a repeat LVO assessment. Stroke Severity Scale repeated by ED physician and suspects LVO but VS stable. Patient is connected to monitors. Hospital stroke alert called, Stroke Team and EVT Team at the receiving CSC is notified of potential interfacility transfer. Patient registration collects information from family and EMS to initiate quick registration process. ED physician orders facility's AIS Protocol. Blood glucose is checked and labs ordered. Patient is brought directly to CT scanner by EMS Crew and ED Nurse. Stroke team meets patient at CT and neurologist performs stroke exam and team obtains NIHSS of 10 as CT team prepares scanner. Patient is transferred onto the scanner. As patient is positioned on table, EMS gives report to Stroke Team. Neurologist interprets the scan as the patient is scanned. CT scan is negative for bleed and Alteplase Protocol is ordered and initiated.

Setting:

- Emergency Department
- CT Scanner
- Cath Lab

Patient approximate weight is obtained and pharmacy notified for dosing. Stroke team completes their examination and reviews thrombolytic checklist. As Alteplase is prepared patient is prepped for CTA and it is completed. Patient is transferred from CT table onto hospital bed and moved to ED. 12-lead ECG completed at bedside. Lab personnel at bedside to draw labs. Alteplase arrives at bedside and initial bolus pushed and infusion started. Patient is monitored per facility's Alteplase protocol. Radiology confirms: CTA results of a large clot to proximal L MCA. Patient is a candidate for EVT. EVT Team at receiving CSC notified of emergent transfer. Process of emergent interfacility transfer initiated. EMS notified of need for ACLS Unit for emergent transfer of patient with Alteplase infusing. Patient and records, including results and images from CTA, prepared for interfacility transfer. EMS arrives at ED. Handoff report given to EMS crew. Patient is transferred to receiving CSC with a Door in Door Out time of less than 90 minutes.

Scenario Ends



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SCENARIO 4: In-Hospital Acute Stroke with Large Vessel Occlusion

Hospital

Actors:

- Patient 74 y/o female
- ICU Nurse
- In-house Code Stroke Team
- Neurology
- Endovascular team

Mrs. H is a 74-year-old with a history of hypertension, hyperlipidemia, type 2 diabetes, stroke, coronary artery disease, asymptomatic carotid stenosis, and status/post left carotid endarterectomy. She was admitted to the hospital and underwent single vessel CABG and AVR after presenting with fatigue, dyspnea, and exercise intolerance. Her pre-op EF was 65%. The procedure lasted 4 hours.

At 16:45 she arrives to the ICU sedated and intubated, Cardiac ICU team records Glasgow Coma Scale (GCS) as 3. Her post-op TEE shows normal prosthetic aortic valve function without clot, EF 55%-60%, and a large left atrial appendage. Assessments at 2000 and 0000 both show a GCS of 8. She is extubated at 0200 and nurses document she is confused and disoriented. At 0800 assessment, she is sleeping unless stimulated. When awakened to bathe, RN notes that her left arm is not moving equally as compared to the right, and her eyes are continually looking toward the right. An in-house code stroke was called at 08:15.

Setting:

- Hospital

The Stroke team notes last known well as immediately prior to surgery. Nurse reports to stroke team:

- BP 98/51 (BP had been as low as 82/50 during the night) Respiratory rate 18, O₂ Sat 92.
- NSR 88, patient had intermittent rapid atrial brillation during night.
- ICU assessment remained same – weak left arm and patient looking toward right. Reported GCS (11).
- Blood Glucose 131.



SCENARIO 4: In-Hospital Acute Stroke with Large Vessel Occlusion *continued*

Stroke Team Plan

- Oxygen placed to maintain saturation of > 94%.
- Stat non-contrast CT although patient is not a candidate for alteplase because LKW prior to surgery day before.
- Stat DW-MRI to determine ischemic core volume and mismatch ration and volume. Note: MRI is safe following a valve replacement (tissue or mechanical).
- Assessment with NIH Stroke Scale.
- Notify neurologist and endovascular team to evaluate if patient is a candidate for endovascular therapy (EVT).
- Neurologist and endovascular team met in CT. Neurology examined patient and repeated the NIHSS which was the same on the unit when performed by the stroke team. Team reviewed the diagnostic imaging results.

National Institute of Health Stroke Scale Score

LOC 1a	2	Required repeated stimulation to arouse
LOC 1b	2	Unable to answer correct month and age
LOC 1c	0	Opens and closes eyes and will grip hand on command
Gaze	1	Gaze preference to right, but could look to left
Visual fields	2	Visual threat – complete hemianopia – visual field loss to left
Facial palsy	1	Left lower facial droop
Motor – right arm	0	No drift
Motor – left arm	3	No effort against gravity
Motor – right leg	0	No drift
Motor – left leg	1	Slight drift, does not touch the bed in 5 sec
Ataxia	0	Weakness on left – ataxia absent
Sensory	1	Pinprick on left elicits less moaning
Language	0	No aphasia
Dysarthria	1	Mild slurring of speech
Extinction	1	Visual hemi-inattention
Total	14	Severe Right Hemisphere Stroke



SCENARIO 4: In-Hospital Acute Stroke with Large Vessel Occlusion *continued*

Diagnostic Imaging Results

- Non-contrast CT Head completed at 08:35 shows hyperdense right middle cerebral artery (MCA) and no area of intracranial hemorrhage. ASPECT Score 7
- CT angiogram completed to evaluate for large vessel occlusion – results M1 Clot of right MCA.
- DW-MRI completed. Target mismatch on prole was: Ischemic core volume 60 ml
- Mismatch Ration was 2.0
- Mismatch volume was 18 ml
- After reviewing tests it was decided to attempt mechanical clot retrieval.
- Neurologist and Interventionalist discussed risks with family. Family consented to take patient for EVT.

Endovascular Suite

- Taken to endovascular suite by 09:35 mechanical retrieval of clot with successful reperfusion.

Scenario Ends



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SCENARIO 5: ICH Field to Hospital Stabilize for Transport to CSC

Prehospital

Actors:

- Patient 55 yr old black male
- Wife: approximately same age
- 911 Dispatcher
- Engine company
- ALS ambulance crew

Mr. C is a 55 yr old black male. As he and his wife are getting ready for bed, he begins to have difficulty speaking, displays a R facial droop and cannot move his R side.

His wife recognizes something is terribly wrong and calls 911 at 9:40.

The Emergency Medical Dispatch (EMD) trained dispatcher takes the call and establishes location, level of consciousness, and last known well/onset history, then asks a series of more specific questions:

- **Does his speech sound normal?** *No.*
- **Does he have weakness or paralysis on one side of his body?** *He can't move his right side. He is slumping over to his right.*
- **Does he have facial droop?** *Yes.*
- **Does he have a headache?** *He can't get his words out to answer.*
- **Has he ever had a stroke before?** *No.*

Setting:

- Residential home

The dispatcher sends out a call for a possible stroke to both an engine company and the nearest ALS unit from the neighboring county. She tells the wife to keep her husband calm, secure any pets and stay on the phone.

The fire department arrives within 8 minutes of being dispatched (9:55). They secure the scene, collect their equipment and approach the home. The wife is waiting on the front porch and quickly ushers them inside and takes them to the bedroom where her husband is lying on the bed.



SCENARIO 5: ICH Field to Hospital Stabilize for Transport to CSC *continued*

The crew follows and approaches Mr. C. He is conscious with good color, but is looking away from the door to his left. They engage contact with him and complete the initial assessment:

- He is alert and protecting his airway, is breathing adequately and has a strong, regular pulse. His skin is warm and dry. The EMT notes he has a R facial droop and proceeds with further assessment. His engine lieutenant escorts Mrs. C to the kitchen to collect more information.
- He asks about the onset of symptoms to determine the exact last known well. She states they had just started to get ready for bed after their favorite show went off the air at 9:30, when he stopped talking and slumped onto the bed.
- He continues with further questions to determine patient history and medications. Mrs. C states that her husband doesn't really have much medical history except gout and high blood pressure. He is taking some medications for those things. She can't remember the names, so the lieutenant asks for the bottles to take to the hospital. She brings 3 bottles. The labels read: allopurinol, colchicine, and lisinopril.

The EMT places Mr. C on pulse oximetry and notes O2 saturation to be 96%. Further vital sign assessment reveals: pulse 94; Resp rate: 20; blood pressure 198/98. Mr. C tries to speak but he is becoming agitated as he cannot get his words out. The EMT proceeds to score the **Cincinnati Prehospital Stroke Scale (CPSS)** to identify if having a stroke.

The ALS crew arrives at 10:05 and assists with assessment:

Facial droop

Abnormal: R facial droop, L normal

Arm drift

Abnormal: R arm falls, L normal

Speech

Abnormal: Only able to answer yes/no questions, can't form sentences

Last known well is now 35 minutes ago. The Lieutenant reports history/exam findings to paramedic crew who quickly place Mr. C on a cardiac monitor and move him to the stretcher. The lead paramedic is keenly aware that Mr. C's symptoms appear to represent a large stroke and proceeds to perform and score the Field Assessment for Stroke Triage Emergency Destination (FAST-ED) exam to assess for possible large vessel occlusion.

Facial palsy

Partial = 1

Arm weakness

No effort against gravity = 2

Speech changes

Mild to moderate = 1

Eye deviation

Partial = 1

Neglect

Orients to only 1 side = 2

The FAST-ED score is 7 and the threshold is met for a suspected large vessel occlusion but the EMT informs the paramedic that the transit time to the closest CSC is 1 hour further than the closest PSC.

Mr. C is loaded onto the ALS truck and the driver calls ahead to the PSC with report of their findings. IV access is established while the wife secures the home and is loaded into the front seat of the ambulance. She is instructed to bring the medications and any health and insurance information along with her cell phone. The paramedic also obtains her cell phone # and records in the record.

While en route, a 2nd large bore IV is established and the reassessment shows no changes. A blood sugar is obtained and resulted at 189.

Upon arrival to the PSC's emergency department at 10:45, the crew is greeted by the ED physician and staff. Last known well time is now 1 hr 45 mins ago.



SCENARIO 5: ICH Field to Hospital Stabilize for Transport to CSC *continued*

Hospital

Actors:

- Patient: 55 yr old black male
- Wife: Approximately same age
- ED staff
- Radiology staff
- Lab staff

Paramedic crew enters ED with patient on gurney accompanied by his wife. They are greeted in the ambulance bay by the ED MD and ED RN. Complete report is given, including last known well, VSs, blood sugar, and medications. Initial evaluation is performed to determine stability for direct transport to CT. Patient is transferred to hospital monitor, assessment completed and stroke alert is called. Paramedic crew, accompanied by ED RN proceed to CT scanner with patient on gurney. Wife is escorted to the front ED room, where she is met by the registration clerk to complete quick registration process. Hand off report is completed in transit to CT. Staff has CT table ready as they were alerted with an ETA when EMS called ahead. Patient is transferred to the CT table.

While patient is on way to CT, the ED MD orders the acute stroke protocol (including CT and CTA, and labs) then calls the on-call stroke neurologist with an initial report to include last known well, symptoms, VSs and blood sugar. The neurologist advises to prepare to administer alteplase if CT is negative and no contradictions are identified. He is on the way.

Setting:

- PSC emergency department
- CT scanner

NIHSS

1a = 1	3 = 1	6a = 0	9 = 2
1b = 2	4 = 2	6b = 3	10 = 2
1c = 0	5a = 0	7 = 0	11 = 2
2 = 1	5b = 4	8 = 1	Total = 21

Patient is moved to a stretcher with scale and returned to the ED. Labs are drawn. ALS crew is requested to remain on stand-by, as patient will most likely be going on to CSC for intervention. Radiology calls back to ED MD with report that CT scan shows a large left frontotemporal parenchymal hemorrhage with minimal surrounding edema. Mild mass effect present with 2mm midline shift. CTA shows no aneurysm. ED MD calls back to stroke neurologist to cancel stroke alert and calls the CSC to request immediate transfer as per their transfer agreement.



SCENARIO 5: ICH Field to Hospital Stabilize for Transport to CSC *continued*

The patient's wife is updated by the ED MD who tells her of the CT findings and that her husband will need to transfer on to the closest CSC for neurosurgical management.

ED MD instructs nursing staff to follow the protocol for care of ICH for blood pressure management. The ED nurse starts a nicardipine drip to decrease SBP to 140 mm Hg. The ALS crew is updated on the patient condition, and orders for management of the blood pressure, as well as need for immediate transfer.

Labs are resulted and coagulation panels are within normal limits. No treatment is warranted. Patient is still awake and maintaining airway with O₂ saturation at 95% on room air.

Call returned by CSC neurosurgeon, accepting patient. Full status report is given while ED staff and ALS crew prepare patient for transport.

The wife's sister was called by the nursing staff at her request. She has arrived and will drive the wife to the CSC. Cell phone # verified by ALS crew to confirm it is documented correctly in the record prior to pulling out.

Patient transferred to CSC via ambulance.

Scenario ends