INTERPROFESSIONAL STROKE ALERT SIMULATIONS FOR HOSPITALIST TRAINEES

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BACKGROUND: The Society of Hospital Medicine considers stroke care to be a core competency in hospital medicine. Hospitalists must be prepared to lead inpatient stroke alerts, as neurologists may not be readily available outside of academic medical centers. However, even graduates of hospitalist training programs may report insufficient experience in leading these complex, time-pressured, high-stakes clinical encounters. In our Hospitalist Training Program, residents traditionally complete two 4-week Consult/Neuro rotations over their PGY2 and PGY3 years, in which they assist the neurology team during stroke alerts. However, a focused needs assessment of recent graduates indicated that more hands-on stroke alert training would have been particularly beneficial.

PURPOSE: Describe an interprofessional stroke alert simulation curriculum as an innovative educational strategy for hospitalist trainees.

DESCRIPTION:
We developed stroke alert simulation sessions, which were held 5 separate times over academic year 2015-2016 at the simulation center on campus. PGY3 residents were required to complete online National Institutes of Health Stroke Scale (NIHSS) certification prior to the simulation sessions. They participated in two 30-minute inpatient scenarios with NP/PA fellows, pharmacy residents, a standardized patient, and a nurse confederate. The first scenario involved a patient admitted with a transient ischemic attack that subsequently developed a right middle cerebral artery stroke. The second scenario involved a patient with a posterior circulation stroke after a total knee arthroplasty. Each simulation was followed by a structured debriefing session with interprofessional faculty. On a 5-point Likert Scale (1 = strongly disagree to 5 = strongly agree), residents and NP/PA fellows (n=11) reported greater confidence in their ability to elicit a focused history in a patient with suspected stroke (3.2 to 4.1), accurately perform the NIHSS (2.5 to 3.8), and initiate the appropriate evaluation for acute ischemic stroke (3.4 to 4.2) as a result of the educational intervention. They better understood the indications and contraindications for IV tPA (3.5 to 4.3) and felt more comfortable explaining its risks and benefits to patients and families (2.1 to 4.2). Overall, they agreed that simulation training was a valuable educational experience (4.9) and that it would enable them to function more effectively on an interprofessional stroke team (5.0) in the future.

CONCLUSIONS:

While stroke simulation scenarios exist for neurology and emergency medicine trainees, to our knowledge, none have been specifically designed for hospital medicine providers. Our results suggest that our learners found the deliberate practice and self-reflection in a safe, controlled environment to be an effective way of enhancing their knowledge and skills around stroke alerts.

Word count: 412

NIH Stroke Scale Mini-CEX

Resident Instructions

- Administer stroke scale items in the order listed
- Do not coach patient, except where indicated
- Accept patient's first effort
- Score what the patient does, not what you think the patient can do
- Follow directions provided for each exam technique
- Record performance in each category after each subscale item
- Do not go back and change scores
- Verbalize your score for each item aloud so the faculty member can record it

Faculty Instructions

- Observe the resident performing the NIHSS
- Fill in the PGY3 and faculty scores for each item as the resident proceeds through the NIHSS
- Provide formative feedback on the resident's performance

Additional Instructions

Please answer the questions below. Residents must ***turn in a signed and completed copy*** of this form to the Consults/Neuro Rotation Director at their stroke simulation session at the WELLS Center.

1. I feel more confident in my ability to perform the NIHSS after this mini-CEX.
   1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree.

   Circle: 1 2 3 4 5

2. Please describe one thing that you learned about the NIHSS from this mini-CEX.
   _____
   _____
   _____

3. With regards to the NIHSS, I feel that I still need more practice with:
   _____
   _____
   _____

Signatures: _____ _____
Resident **Date**

_____ _____
Faculty **Date**

Item	Scale Definition Score:	PGY3	Faculty	Comments:
1a. Level of Consciousness	0 = Alert 1 = Drowsy 2 = Stuporous 3 = Coma			
1b. LOC Questions *Ask month and age.*	0 = Answers both correctly 1 = Answers one correctly 2 = Answers neither correctly			
1c. LOC Commands *Ask to close and open eyes.* *Ask to grip and release hand.*	0 = Performs both correctly 1 = Performs one correctly 2 = Performs neither correctly			
2. Best Gaze *Test horizontal eye movements.*	0 = Normal 1 = Partial gaze palsy 2 = Forced deviation or total gaze paresis			
3. Visual *Test visual fields in each eye using confrontation, finger counting, or visual threat.*	0 = No visual loss 1 = Partial hemianopsia 2 = Complete hemianopsia 3 = Bilateral hemianopsia			
4. Facial Palsy *Ask patient to show teeth, close eyes, and raise eyebrows.*	0 = Normal symmetrical movement 1 = Minor paralysis 2 = Partial paralysis (lower face) 3 = Complete paralysis			
5. Motor Arm *Extend each arm palm down 90 degrees (if sitting) or 45 degrees (if supine) for 10 seconds.*	0 = No drift 1 = Drift 2 = Some effort versus gravity 3 = No effort versus gravity	R = L =	R = L =	
6. Motor Leg *Extend each leg 30 degrees for 5 seconds (always test supine).*	0 = No drift 1 = Drift 2 = Some effort versus gravity 3 = No effort versus gravity	R = L =	R = L =	
7. Limb Ataxia *Perform the finger-to-nose and heel-to-shin tests on both sides.*	0 = Absent 1 = Present in one limb 2 = Present in two or more limbs UN = Amputation or joint fusion			
8. Sensory *Test sensation on face, arms, and legs.*	0 = Normal 1 = Mild-to-moderate sensory loss 2 = Severe-to-total sensory loss			
9. Best Language *Ask patient to describe the picture, name the items, and then read the sentences.*	0 = No aphasia 1 = Mild-to-moderate aphasia 2 = Severe aphasia 3 = Mute, global aphasia			
10. Dysarthria *Ask patient to read or repeat words from the attached list*	0 = Normal articulation 1 = Mild-to-moderate dysarthria 2 = Severe dysarthria UN = Intubated or other physical barrier			
11. Extinction and Inattention *Check for visual extinction.* *Check for tactile extinction.*	0 = No abnormality 1 = Visual, tactile, auditory, spatial, or 1 = personal inattention 2 = Profound hemi-inattention or 2 = extinction to more than one modality			
TOTAL SCORE				

Stroke Simulation – Pre-Session Evaluation

Level of training (circle): PGY3 APF Pharmacy resident

Please answer the 6 items below, where:

1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

1. I feel confident in my ability to elicit a focused history in a patient with suspected stroke.	1	2	3	4	5
2. I feel confident in my ability to accurately perform the NIH Stroke Scale.	1	2	3	4	5
3. I feel confident in my ability to initiate the appropriate evaluation for acute ischemic stroke.	1	2	3	4	5
4. I understand the indications and contraindications for IV tPA.	1	2	3	4	5
5. I feel comfortable explaining the risks and benefits of IV tPA to patients and their families?	1	2	3	4	5
6. I feel comfortable independently treating acute stroke patients with IV tPA.	1	2	3	4	5

I have completed NIHSS training (circle): Yes No

I have observed IV tPA treatment in a patient (circle): Yes No If yes, how many times? _____

I have provided post-IV tPA care (circle): Yes No

What do you most hope to get out of the simulation session today?

Stroke Simulation – Post-Session Evaluation

Level of training (circle): PGY3 APF Pharmacy resident

Please answer the 9 items below, where:

1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

1. I feel confident in my ability to elicit a focused history in a patient with suspected stroke.	1	2	3	4	5
2. I feel confident in my ability to accurately perform the NIH Stroke Scale.	1	2	3	4	5
3. I feel confident in my ability to initiate the appropriate evaluation for acute ischemic stroke.	1	2	3	4	5
4. I understand the indications and contraindications for IV tPA.	1	2	3	4	5
5. I feel comfortable explaining the risks and benefits of IV tPA to patients and their families?	1	2	3	4	5
6. I feel comfortable independently treating acute stroke patients with IV tPA.	1	2	3	4	5
7. The simulation training was a valuable educational experience.	1	2	3	4	5
8. The simulation training will change the way I approach an acute stroke patient.	1	2	3	4	5
9. The simulation training will help me to function more effectively in an interprofessional stroke team.	1	2	3	4	5

What did you find most helpful about the simulation session(s)?

What was the most important learning point for you?

How could the simulation session(s) be improved for future learners?

WELLSCenter
Work, Education and Lifelong Learning Simulation Center

University of Colorado Hospital
UNIVERSITY OF COLORADO HEALTH

WELLS CENTER SIMULATION SCENARIO	
Scenario Title	R MCA Ischemic Stroke/Inpatient
Scenario Number	
Pilot Date	July 2015
Discipline	Hospital Medicine
Content Area	Neurology Critical Care
Authors/Content Experts	Mary Anderson, MD Jennifer Simpson, MD Darlene Tad-y, MD Brian Wolfe, MD
WELLS Center Simulation Experts	Margaret Sande, MD MS MSHPEd, WELLS Medical Director Veronica Baiamonte, Simulation Technical Coordinator, Sr. Stephanie Cradick, RN, Simulation Clinical Coordinator Nicole Friesen, BA, Simulation Lab Technician
Current Evidence Based Practice	1. Johnston SC, et al. Validation and refinement of scores to predict very early stroke risk after transient ischemic attack. *Lancet.* 2007;369:283-292. 2. Jauch EC, et al. Guidelines for the Early Management of Patients with Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the AHA/ASA. *Stroke*. 2013;44:870-947. 3. Gadhia J, et al. Assessment and Improvement of Figures to Visually Convey Benefit and Risk of Stroke Thrombolysis. *Stroke.* 2010;41:300-306. 4. The National Institute of Neurologic Disorders and Stroke rt-PA Stroke Study Group. Tissue Plasminogen Activator for Acute Ischemic Stroke. *N Engl J Med*. 1995;333(24):1581-1587.
Scenario Objectives	<u>Hospitalist Training Program residents</u> ☐ Elicit a focused history in a patient with suspected stroke

	☐ Accurately perform the NIHSS ☐ Initiate the appropriate evaluation and treatment for acute ischemic stroke in a time-sensitive manner ☐ Demonstrate understanding of the indications and contraindications to IV tPA ☐ Appropriately consent patients for IV tPA ☐ Employ an interprofessional approach to the care of stroke patients <u>Advanced Practice Fellows</u> ☐ Perform a focused history and physical examination to identify signs and symptoms of stroke ☐ Mobilize resources to advance the care of patients with suspected acute ischemic stroke ☐ Employ an interprofessional approach to the care of stroke patients
Prerequisite Knowledge/Skills	☐ NIHSS certification (Hospitalist Training Program residents) ☐ Initial management of acute ischemic stroke
Participants	☐ Hospitalist Training Program residents (PGY3) ☐ Advanced Practice Fellows (NP/PAs)
Actors	☐ Standardized patient – Male or Female (with earpiece) ☐ RN (with earpiece) ☐ Family member (optional) ☐ Pharmacist (optional)
Groups/Assigned Roles	☐ Hospitalist – 1 Hospitalist Training Program resident ☐ Advanced Practice Provider (APP) - 1 Advanced Practice Fellow
Allotted Time	Scenario: 30 minutes; Debrief: 30 minutes
Scenario Synopsis	Mr./Mrs. Smith is a 70-year-old male/female with HTN, HLP, and tobacco abuse who has been admitted overnight for expedited work-up of a TIA. His/her TIA was characterized by 60 minutes of unilateral L-sided weakness that resolved prior to arrival in the ED. This morning, she develops sudden onset slurred speech and L-sided weakness concerning for recurrent TIA versus R MCA CVA.
Mannequin Room Set-Up	☐ Patient in bed wearing hospital gown (on telemetry) ☐ #18 gauge peripheral IV in right wrist ☐ BP cuff/SpO2 probe ☐ Epic workstation ☐ Whiteboard ☐ Hospitalist residents and APFs have mock patient signout ☐ Time clock begins from 00:00

Medication/Supplies/Equipment Available for Use	☐ Glucometer/test strip/lancet ☐ Peripheral IV ☐ Blood draw supplies ☐ Portable cardiac monitor, including BP cuff and SpO2 probe ☐ IV antihypertensives (IV labetalol, metoprolol, or diltiazem) ☐ IV tPA
Scenario Initial Script (Facilitator to Hospitalist Training Program resident and APF)	You are the hospitalist and APP on the hospital medicine service at a small community hospital. The nocturnist is about to give you signout in the designated conference room. "Are you all ready for signout? I'm exhausted and have to be back tonight…" "Mr./Mrs. Smith is a 70-year-old male/female with HTN, HLP, and tobacco abuse who was admitted last night for expedited work-up of a TIA with an $ABCD^2$ score of 6. Where I trained, these patients went to Neurology, but of course that's one of the differences working at a small community hospital." "His/her TIA was characterized by 60 minutes of unilateral L-sided weakness that resolved prior to arrival in the ED. Overnight, there were no events. Vital signs have been stable, with normal blood pressures. His/her current medications include aspirin, which is new; lisinopril; atorvastatin; nicotine patch; and subcutaneous heparin. His/her admission labs were normal. A fasting lipid panel drawn this morning is pending. Imaging thus far has been unrevealing, with a negative brain MRI, no events on telemetry, and no carotid stenosis on ultrasound. A TTE is pending." The patient's nurse enters the conference room. He/she has just gotten a call from the telemetry tech that the patient has gone into atrial fibrillation with a rapid ventricular response. He/she is going in to check a new set of vitals. She requests that the APP accompany her while the hospitalist finishes up with signout. *NOTE: Participating hospitalist & pharmacist should await call in from hallway, not observing video feeds!*
Scenario Script	

Patient Actions *(Vitals/Vocals)*	**Performance Measures** *(Expected Actions)*	**Facilitator Notes** *(Cues/Prompts/Rationales)*
STATE 1: INITIAL ASSESSMENT (APP) **TIME IN STATE: 10 minutes** **Monitor: Atrial fibrillation in rapid ventricular rate** **VITALS (as reported by RN):** ☐ Temp: 37.0 ☐ HR: 120 ☐ BP: 193/105 ☐ RR: 18 ☐ Sat: 96% on RA **VOCALS:** ☐ Patient's speech is slurred but understandable ☐ "My left arm and leg feel weak again" ☐ If asked, endorses palpitations but denies SOB or CP ☐ If asked, does not know when symptoms started	☐ APP performs focused history and physical examination ☐ APP clarifies time last known normal ☐ APP calls stroke alert ☐ APP may request stat ECG ☐ APP may request POCT glucose (= 108) ☐ APP may order stat labs (CBC, BMP, PT/INR, PTT, and troponin) ☐ APP may order stat CT head ☐ APP may request IV BP medication ☐ APP may consider initiation of the NIHSS	☐ If asked about time last known normal, RN replies that the patient was fine when he/she assisted him/her to the bathroom 30 minutes ago ☐ APP should quickly recognize that patient's symptoms are concerning for stroke ☐ If APP does not call stroke alert, RN should prompt APP: "Mr./Mrs. Smith, you sound different…" To APP: "Does his/her speech sound slurred to you?" ☐ After calling the stroke alert, RN informs APP that the stroke team is unavailable at this time. RN suggests paging hospitalist. ☐ RN confederate retrieves hospitalist resident and pharmacist from hallway
STATE 2: HOSPITALIST ARRIVES **TIME IN STATE: 8 minutes** **Monitor: Atrial fibrillation** **VITALS (as reported by RN):** ☐ Temp: 37.3 ☐ HR: 109 ☐ BP: 165/88 ☐ RR: 12 ☐ Sat: 90% RA **VOCALS:** ☐ Slurred speech ☐ ***See "answers" to NIHSS in next column***	☐ Hospitalist obtains focused history from APP/RN/patient and verifies time last known normal ☐ Hospitalist begins NIHSS ☐ Hospitalist ensures appropriate stat labs drawn ☐ Hospitalist ensures stat CT head ordered **NIHSS** **Questions:** Answers questions correctly **Commands:** Patient is able to close eyes and squeeze right hand **Best gaze:** Normal **Visual:** Able to count fingers **Face:** Minor paralysis on left **Motor arm, Right:** No drift **Motor arm, Left:** Some effort	***Note: Increase SpO2 to 98% if oxygen applied.*** ☐ After stroke alert called, RN repeats vitals, places 18 or 20-gauge antecubital peripheral IV, and verifies labs to be drawn (if not already performed)

	against gravity **Motor leg, Right:** No drift **Motor leg, Left:** Drift **Limb ataxia:** Absent (unable to be tested on left arm) **Sensory:** Mild-to-moderate sensory loss. Patient feels pinprick less on affected side but is aware of being touched. **Best language:** No aphasia **Dysarthria:** Mild-to-moderate dysarthria (slurs some words but can be understood with some difficulty) **Neglect:** No abnormality **TOTAL NIHSS: 6**	
STATE 3: BLOOD PRESSURE INCREASES **TIME IN STATE: 3 minutes** **Monitor: Atrial fibrillation in rapid ventricular rate** **VITALS:** ☐ Temp: 37.0 ☐ HR: 120 ☐ BP: 200/112 ☐ RR: 18 ☐ Sat: 96% on RA **VOCALS:** ☐ Per SP script	☐ Hospitalist completes NIHSS ☐ Hospitalist or APP have RN administer IV BP medication	☐ RN places patient on portable cardiac monitor in preparation for transport ☐ RN asks if hospitalist/APP want additional meds brought down to CT scan (note: Pyxis may not be readily accessible in Radiology) ☐ RN asks if hospitalist/APP want ECG prior to CT scan (note: ECG should not delay CT scan) ☐ RN may ask hospitalist/APP about cardioversion (electrical or pharmacologic) of atrial fibrillation with RVR (note: cardioversion is contraindicated) ☐ RN asks participants to leave room for transfer to Radiology; participants enter adjacent simulation suite for review of head CT images
STATE 4: CT SCAN **TIME IN STATE: 4 minutes**	☐ Hospitalist or APP reviews non-contrast CT head results ☐ Discuss CTA/CTP	☐ Facilitator calls into "Radiology Reading Room" and, acting as radiologist, asks for clinical symptoms to correlate with imaging (including NIHSS) and assists with interpretation

		☐ CTA/CTP contraindicated due to iodine allergy
STATE 5: RETURN TO PATIENT ROOM → ANTIHTN → TPA **+20min on clock** **Monitor: Atrial fibrillation** **VITALS:** ☐ Temp: 37.0 ☐ HR: 90 ☐ BP: 175/88 ☐ RR: 18 ☐ Sat: 96% on RA **VOCALS:** ☐ Consents to IV tPA	☐ Hospitalist or APP have RN administer IV BP medication If labetolol: HR 90 BP 175/88 If diltiazem: HR 90 BP 180/90 If hydralazine: HR 130 BP 175/88 ☐ Team mixes IV tPA ☐ Hospitalist or APP assess for interval improvement ☐ Hospitalist or APP verbally consent patient for IV tPA ☐ Team administers IV tPA once BP < 185/110 ☐ Team plans for transfer to ICU	☐ Clock advances 20min ☐ If labs results requested, RN should report that labs are still in process and remind team about admission labs from the previous evening ☐ Interval exam: L arm now shows drift only, NIHSS = 5 ☐ If participants want to wait on IV tPA given mild improvement in exam, RN should remind them that "every minute counts" and that there has been no improvement in the rest of the exam ☐ Tell Standardized Patient when to give his/her ok!
STATE 6: END SCENARIO **Once tPA to be pushed.**		***Debrief***

Labs

Hematology	**Admission**	**Stroke Alert**	
WBC	6.4	In process	4.0-11.1 10^9/L
Hemoglobin	14.1		12.1-16.3 g/dL
Hematocrit	42.4		35.7-46.7%
Platelets	227		150-400 10^9/L
Basic Metabolic Panel			
Sodium	138	In process	133-145 mEq/L
Potassium	4.2		3.5-5.1 mEq/L
Chloride	103		98-108 mEq/L
CO2	23		21-31 mEq/L
BUN	15		7-25 mg/dL
Creatinine	0.85		0.60-1.20 mg/dL
Glucose	159		70-199 mg/dL
Calcium	8.7		8.6-10.3 mg/dL
Special Labs			
Hemoglobin A1c	5.1%		<5.7%
Fasting lipid panel	In process		
PT/INR	1.0	In process	12.2-14.6 seconds / 0.9-1.1
PTT	28.2	In process	27.6-34.1 seconds
Troponin	0.01	In process	0.00-0.05 ng/ml

ECG: Not actually obtained during this scenario

Imaging: Head CT negative for intracranial hemorrhage

HOSPITAL MEDICINE SERVICE

MD Attending: Name p####
APP: Name p####
Weight: 130 lb (59kg)

01

Patient	Medical History	Current Diagnosis / Procedure	Medications / Past 24 Hours	To Do's
Pat Smith (70 M/F) 1234567 Location: 119 Admit Date: M/D/YYYY Code Status: Full Tele: Ø events overnight	70 y/o M/F with HTN, HLP, and tobacco abuse admitted with 60 minutes of unilateral L-sided weakness concerning for TIA. Allergies: Iodine	# TIA: ABCD^2 score 6. MRI brain, telemetry, and carotid U/S (-). TTE, FLP pending. A1c 5.1%. Antiplatelet agent, BP control, lipid control. # HTN: Controlled on lisinopril # HLP: Statin # Tobacco abuse: Nicotine patch, smoking cessation counseling Diet: 2 gm sodium	ASA 325 mg daily Lisinopril 40 mg daily Atorvastatin 80 mg daily Nicotine patch SQH	**X-Cover:** NTD **Primary:** [ ] f/u TTE [ ] f/u FLP [ ] PCP f/u appt MDPOA: Spouse 555-555-5555 Admit date: M/D/YYYY [2 days] ;

37.6/37.0 74 110/62 18 96 RA

In: 1200 Out: 800
P.O.: 1200 Urine: 600

MM/DD 7:49

6.4	14.1	227
	42.4	

MM/DD 7:49

138	103	15	159	8.7
4.2	23	0.8		

MM/DD 7:49

	28.2
1.0	

Debriefing Framework Tool*		
Orientation		**Notes**
(Create a **safe** and respectful environment) • Why we are here (global objectives for session) • Overview of Estimated Timeline/Schedule • Act in your expected role (unless instructed otherwise) • All participants understand confidentiality • Role of actors (role changes, won't deceive) • Fiction Contract: Limitations of simulation equipment • Assessments/Evaluations? • Use of Video • Confidentiality • Codeword for real events: "This is NOT a sim!"		
Reaction Phase: Participants are given time to **vent** Encourage to share experiences and views / impact (may include both clinical & behavioral elements)		
• What's the first thing that came to your mind when the scenario concluded? • Initial reactions? (for participants & observers) • What were your first impressions from what you just experienced? • What do you want to ensure we talk about during the debrief? (list as 'Parking Lot' topics)		
Analysis Phase: Major events are **deconstructed** **Learning Objectives** are discussed (Pre-published w/ scenario + those learners highlight during 'Reaction Phase')		
• Can someone summarize the scenario? (ensures all learners understand) • Key Providers for each step: Walk us through what happened? • A few things that I thought were really interesting and I want to talk more about… (Preview learning Objectives – yours + theirs) • I saw (positive or erroneous behavior)…I think (your insight)…I wonder what you were thinking / what was going on for you in that moment? • How was communication? With team members? With the patient / family? • How did the team function? Role Clarity? Delegation of responsibility?		

Consolidation Phase / Wrapup (Integration and Closure)		
Summarize learning objectives / points of discussion Ask participants for 'takeaways': What resonated with you that will impact your clinical practice going forward? (each individual responds or select volunteers if large group)		

**Adapted from: Flinders University Rural Clinical School for Country Health, South Australia; Institute for Medical Simulation / Center for Medical Simulation, Charlestown, Massachusetts*

Facilitator Debriefing Notes:

Notes about the ABCD2 Score

- Facilitator may review the $ABCD^2$ score for TIA risk stratification (2007;369:283-292).
- This patient's $ABCD^2$ score of 6 corresponds to a high stroke risk (8.1%) at 2 days.

Notes about the Decision for IV tPA

- Facilitator may review the indications and contraindications for IV tPA (*e.g.*, blood pressure goals) (*Stroke*. 2013;44:870-947).
- Limitations on # of doses of BP medications that can be used prior to IV tPA?
- Participants could not have been certain in this case whether the patient was having a recurrent TIA (whose symptoms would resolve on own) or true R MCA CVA. Since the patient's symptoms were not improving rapidly, IV tPA was appropriate.
- Genentech will reimburse hospital for IV tPA if mixed and not used

Notes about Consent for IV tPA

- For every 100 stroke patients given IV tPA within 3 hours, 32 will get better, 6 will have bleeding complications, and the rest will have no change (*Stroke.* 2010;41:300-306).
- Verbal consent adequate
- Policy for who is allowed to order IV tPA is hospital-dependent

Notes about Atrial Fibrillation and Stroke

- Cardioversion was contraindicated in this case due to the risk of cardioembolism.
- Antiplatelet therapy and VTE prophylaxis should be started 24 hours after IV tPA
- In patients with acute ischemic stroke and atrial fibrillation, early therapeutic anticoagulation (< 48 hours) with heparin or LMWH is contraindicated due to the increased risk of hemorrhagic transformation.
- Timing of initiation of chronic anticoagulation (warfarin or direct oral anticoagulants) depends on the size of the infarct and corresponding risk of hemorrhagic transformation.

WELLS CENTER SIMULATION SCENARIO	
Scenario Title	Posterior Circulation Stroke/Inpatient
Scenario Number	
Pilot Date	July 2015
Discipline	Hospital Medicine
Content Area	Neurology Critical Care
Authors/Content Experts	Mary Anderson, MD Jennifer Simpson, MD Darlene Tad-y, MD Brian Wolfe, MD
WELLS Center Simulation Experts	Margaret Sande, MD MS MSHPEd, WELLS Medical Director Veronica Baiamonte, Simulation Technical Coordinator, Sr. Stephanie Cradick, RN, Simulation Clinical Coordinator Nicole Friesen, BA, Simulation Lab Technician
Current Evidence Based Practice	1. Jauch EC, et al. Guidelines for the Early Management of Patients with Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the AHA/ASA. *Stroke*. 2013;44:870-947. 2. Gadhia J, et al. Assessment and Improvement of Figures to Visually Convey Benefit and Risk of Stroke Thrombolysis. *Stroke.* 2010;41:300-306. 3. The National Institute of Neurologic Disorders and Stroke rt-PA Stroke Study Group. Tissue Plasminogen Activator for Acute Ischemic Stroke. *N Engl J Med*. 1995;333(24):1581-1587. 4. Eisenberg PR, et al. Sustained fibrinolysis after administration of t-PA despite its short half-life in the circulation. *Thromb Haemost*. 1987;57:35-40.
Scenario Objectives	Hospitalist Training Program residents ☐ Elicit a focused history in a patient with suspected stroke ☐ Accurately perform the NIHSS ☐ Initiate the appropriate evaluation and treatment for acute ischemic stroke in a time-sensitive manner ☐ Demonstrate understanding of the indications and

	contraindications to IV tPA ☐ Appropriately consent patients for IV tPA ☐ Employ an interprofessional approach to the care of stroke patients <u>Advanced Practice Fellows</u> ☐ Employ an interprofessional approach to the care of stroke patients
Prerequisite Knowledge/Skills	☐ NIHSS certification (Hospitalist Training Program residents) ☐ Initial management of acute ischemic stroke
Participants	☐ Hospitalist Training Program residents (PGY3) ☐ Advanced Practice Fellows (NP/PAs) ☐ Pharmacist (optional)
Actors	☐ Standardized patient – Male or Female (with earpiece) ☐ RN (with earpiece)
Groups/Assigned Roles	☐ Hospitalist – 1 Hospitalist Training Program resident ☐ Advanced Practice Provider (APP) – 1 Advanced Practice Fellow
Allotted Time	Scenario: 30 minutes; Debrief: 30 minutes
Scenario Synopsis	Mr./Mrs. Jones is a 65-year-old male/female with past medical history significant for CAD, DM2, and remote stroke with no residual deficits who is now s/p elective R total knee arthroplasty. On POD#2, he/she develops symptoms concerning for posterior circulation stroke.
Mannequin Room Set-Up	☐ Patient in bed wearing hospital gown (on continuous pulse oximetry), ACE bandage over right knee, "high-fall risk" socks ☐ #18 gauge peripheral IV in right wrist ☐ BP cuff/SpO2 probe ☐ Epic workstation ☐ Whiteboard ☐ Time clock begins from 00:00
Medication/Supplies/Equipment Available for Use	☐ Glucometer/test strip/lancet ☐ Peripheral IV ☐ Blood draw supplies ☐ Portable cardiac monitor, including BP cuff and SpO2 probe
Scenario Initial Script (Facilitator to Hospitalist Training Program resident) **CALL IN # TO CONF ROOM:**	You are the hospitalist covering the consult service at a small community hospital. You are in the midst of tabletop rounds and are open to receiving consultant calls by phone (if rings, please answer):

85440	"Hi, Dr. [Insert Name]. This is [insert name], the PA on the orthopedic service. I was hoping you could come and evaluate Mr./Mrs. Jones. He/she is a 65-year-old male/female with CAD, DM2, and remote stroke who is now POD#2 from an elective R total knee arthroplasty. He/she started complaining of dizziness, nausea, and diaphoresis around 9:00 AM and wasn't able to work with PT/OT due to unsteadiness. His vital signs have been stable. His hemoglobin yesterday was 9.8 but today's labs haven't been drawn yet, so I don't know if he's having symptomatic anemia. I also ordered an ECG, which is pending. I'm worried about him/her. I have to go back to the PACU to check on one of our patients right now, but I will try to circle back with you."

Scenario Script

Patient Actions *(Vitals/Vocals)*	**Performance Measures** *(Expected Actions)*	**Facilitator Notes** *(Cues/Prompts/Rationales)*
STATE 1: HOSPITALIST ARRIVES **TIME IN STATE: 5 minutes** **Monitor: ECG with normal sinus rhythm and no evidence of ischemia** **VITALS (as reported by RN):** ☐ Temp: 37.0 ☐ HR: 85 ☐ BP: 160/93 ☐ RR: 18 ☐ Sat: 96% on RA **VOCALS:** ☐ "I'm so dizzy I can't even open my eyes" ***Patient responses if asked additional history:*** ☐ "Dizziness is difficult to describe, maybe spinning, maybe poor balance" ☐ "I tried to sit up because I wanted to try and go the bathroom, but the dizziness feeling was overwhelming. There's no way I can walk." ☐ Nausea associated	☐ Hospitalist/APP attempt to clarify symptom onset and basic history to include prior stroke symptoms, prior CAD symptoms, and medications ☐ Hospitalist/APP should request POCT glucose (= 100) ☐ Hospitalist/APP may request additional stat labs (CBC, BMP, PT/INR, PTT, and troponin) ☐ Hospitalist/APP call stroke alert ☐ Hospitalist/APP begin NIHSS	☐ RN can clarify PMH and pretext of hospitalization as necessary ☐ If asked about medications, RN may respond that the patient is taking: - Acetaminophen - Oxycodone - Bowel regimen - Enoxaparin 40 mg SQ daily - ASA 81 mg daily (held for 7 days before surgery, restarted POD#1) - Metoprolol - Simvastatin - Insulin (glargine + lispro) ☐ RN may volunteer that patient has been tolerating oxycodone well, with last 10 mg dose given 2 hours ago with breakfast ☐ RN may volunteer that ondansetron did not relieve the nausea ☐ If asked, RN may report that BP's have been running 130/80's with no orthostasis ☐ RN checks first POCT glucose and reports that it is 120 ☐ Hospitalist should quickly recognize that patient's symptoms are concerning for stroke or stroke mimic

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<td>☐ No chest pain or shortness of breath
☐ Prior stroke: occurred 5 years ago, R-sided weakness, no residual deficits
☐ Prior MI: 3 years ago, characterized by crushing chest pain</td>
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<td>☐ If hospitalist does not call stroke alert, RN should prompt him/her
☐ After calling the stroke alert, RN informs hospitalist that the stroke team is unavailable at this time</td>
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<td>STATE 2: RECOGNITION OF ATAXIA/POSSIBLE CVA

TIME IN STATE: 10 minutes

Monitor: Normal sinus rhythm

VITALS:
☐ Temp: 37.0
☐ HR: 93
☐ BP: 176/100
☐ RR: 18
☐ Sat: 96% on RA

VOCALS:
☐ “Dizziness is worse when I look to one side”
☐ “Can’t see straight…double vision.”
☐ See “answers” to NIHSS in next column</td>
<td>☐ Hospitalist/APP order stat CT head
☐ Hospitalist/APP complete NIHSS

<u>NIHSS</u>
Questions: Answers questions correctly
Commands: Patient is able to close eyes and squeeze right hand
Best gaze: Normal, mild nystagmus at endgaze
Visual: Able to count fingers
Face: Normal
Motor arm, Right: Normal
Motor arm, Left: Normal
Motor leg, Right: Some effort against gravity
Motor leg, Left: Normal
Limb ataxia: Present in L arm and leg
Sensory: Mild-to-moderate sensory loss in right femoral nerve distribution. Patient feels pinprick less on affected side but is aware of being touched.
Best language: No aphasia
Dysarthria: Normal
Neglect: No abnormality

TOTAL NIHSS: 5
(3 points related to femoral nerve block)</td>
<td>☐ RN should hand patient water bottle to demonstrate difficulty coordinating straw to mouth
☐ RN may ask patient to sit up in bed (to adjust sheet/pillow?) to demonstrate truncal ataxia
☐ After stroke alert called, RN places 18 or 20-gauge antecubital peripheral IV, verifies labs to be drawn, and places patient on portable cardiac monitor in preparation for transport
☐ When hospitalist begins to examine R leg, RN should volunteer that the patient’s femoral nerve block catheter was just removed this morning
☐ RN asks participants to leave room for transfer to Radiology; participants enter adjacent simulation suite for review of head CT images</td>
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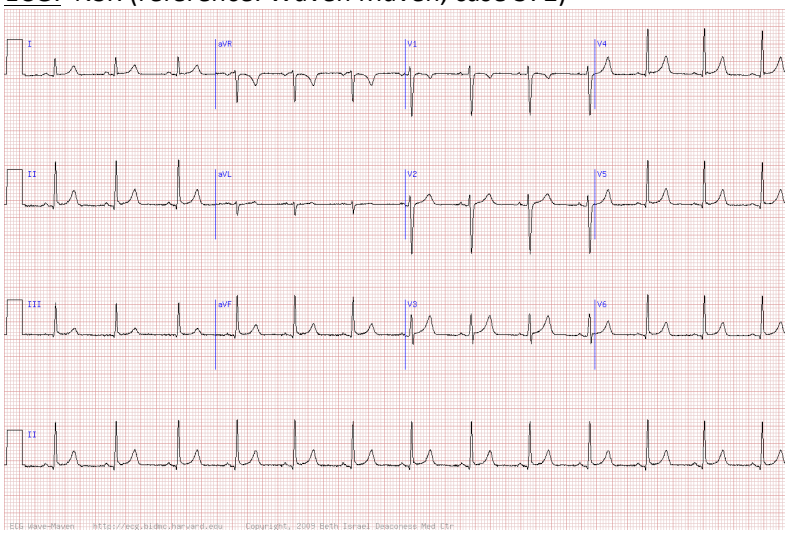
STATE 3: READING ROOM WHILE PATIENT IN CT SCAN **TIME IN STATE:** *(Time clock moves ahead 10 minutes; should be 7 minutes of "real" time)* **Monitor: Normal sinus rhythm**	☐ Hospitalist/APP should recognize that recent major surgery is a relative contraindication to IV tPA ☐ Hospitalist/APP reviews non-contrast CT head results	☐ Facilitator calls into "Radiology Reading Room" and, acting as radiologist, asks for clinical symptoms to correlate with imaging (including NIHSS) and assists with interpretation; decision to pursue CTA/CTP; no target for IA thrombolysis noted
STATE 4: RETURN TO PATIENT ROOM **TIME IN STATE: 8 minutes** **Monitor: Normal sinus rhythm** **VITALS:** ☐ Temp: 36.6 ☐ HR: 86 ☐ BP: 174/98 ☐ Sat: 96% on RA **VOCALS:** ☐ Patient comments that his/her dizziness would be extremely disabling and that getting new knee was "pointless" if unable to walk. ☐ Patient asks whether he/she could get "that clot-busting drug" again	☐ Hospitalist/APP should assess for interval improvement (none) ☐ Hospitalist/APP reviews labs (should verifies stability of H&H post-op, platelets > 100, and normal coags) ☐ Hospitalist/APP discusses risks/benefits of IV tPA with orthopedic team ☐ Hospitalist/APP discusses risks/benefits of IV tPA with patient ☐ Decision for/against IV tPA made	☐ Labs return ☐ RN suggests updating attending orthopedic surgeon ☐ RN "pages" orthopedic surgeon ☐ Facilitator calls into room and, acting as orthopedic surgeon, discusses case with hospitalist/APP ☐ Orthopedic surgeon is very concerned about risk of bleeding if IV tPA is administered but ultimately agrees that benefits may outweigh risks for this patient ☐ Orthopedic surgeon prompts hospitalist to explain the contingency plan if patient develops joint hematoma (stuck in OR)
STATE 5: END SCENARIO When TPA to be pushed OR patient agrees w/ decision to defer.		***Debrief***

Labs

Hematology	POD#0	POD#1	POD#2	Stroke Alert	
WBC	7.2	12.9	Needs to be drawn	10.1	4.0-11.1 10^9/L
Hemoglobin	12.5	9.8		10.6	12.1-16.3 g/dL
Hematocrit	37.5	29.4		31.8	35.7-46.7%
Platelets	196	107		166	150-400 10^9/L
Basic Metabolic Panel					
Sodium		135		136	133-145 mEq/L
Potassium		3.6		3.7	3.5-5.1 mEq/L
Chloride		101		102	98-108 mEq/L
CO2		24		24	21-31 mEq/L
BUN		12		14	7-25 mg/dL
Creatinine		0.91		1.07	0.60-1.20 mg/dL
Glucose		230			70-199 mg/dL
POCT Glucose		89-254	202	100	70-199 mg/dL
Special Labs					
PT/INR	1.0			1.1	12.2-14.6 seconds / 0.9-1.1
PTT	29.3			31.0	27.6-34.1 seconds
Type and screen	O POS				
ABO Rh Type	O POS				
Antibody screen	Negative				
Troponin				0.01	0.00-0.05 ng/ml

ECG: NSR (reference: Waven Maven, case 372)



Imaging: CTA

Debriefing Framework Tool*		
Orientation		**Notes**
(Create a **safe** and respectful environment) • Why we are here (global objectives for session) • Overview of Estimated Timeline/Schedule • Act in your expected role (unless instructed otherwise) • All participants understand confidentiality • Role of actors (role changes, won't deceive) • Fiction Contract: Limitations of simulation equipment • Assessments/Evaluations? • Use of Video • Confidentiality • Codeword for real events: "This is NOT a sim!"		
Reaction Phase: Participants are given time to **vent** Encourage to share experiences and views / impact (may include both clinical & behavioral elements)		
• What's the first thing that came to your mind when the scenario concluded? • Initial reactions? (for participants & observers) • What were your first impressions from what you just experienced? • What do you want to ensure we talk about during the debrief? (list as 'Parking Lot' topics)		
Analysis Phase: Major events are **deconstructed** **Learning Objectives** are discussed (Pre-published w/ scenario + those learners highlight during 'Reaction Phase')		
• Can someone summarize the scenario? (ensures all learners understand) • Key Providers for each step: Walk us through what happened? • A few things that I thought were really interesting and I want to talk more about… (Preview learning Objectives – yours + theirs) • I saw (positive or erroneous behavior)…I think (your insight)…I wonder what you were thinking / what was going on for you in that moment? • How was communication? With team members? With the patient / family? • How did the team function? Role Clarity? Delegation of responsibility?		

Consolidation Phase / Wrapup (Integration and Closure)		
Summarize learning objectives / points of discussion Ask participants for 'takeaways': What resonated with you that will impact your clinical practice going forward? (each individual responds or select volunteers if large group)		

**Adapted from: Flinders University Rural Clinical School for Country Health, South Australia; Institute for Medical Simulation / Center for Medical Simulation, Charlestown, Massachusetts*

Facilitator Debriefing Notes:

Notes about Posterior Circulation Strokes

- Many posterior circulation symptoms can be missed on NIHSS.
- Posterior circulation strokes can be difficult to see on CT head.
- Posterior circulation is not well-visualized on regular CTP, but CTP of posterior fossa can be requested. On the new scanners, the posterior fossa is viewed some, and the windows cannot be changed.

Notes about the Decision for IV tPA

- Facilitator may review the indications and contraindications for IV tPA; major surgery within 14 days is considered a relative but not absolute contraindication (*Stroke*. 2013;44:870-947)
- There is a lack of literature to guide decision-making about IV tPA in post-operative patients with acute ischemic strokes. From a surgical perspective, important considerations include: (1) time since surgery, (2) adequacy of hemostasis at the time of closure and stability of H&H post-op, (3) availability of surgical team if patient develops life or limb-threatening hemorrhage from the surgical site or compartment syndrome, (4) risk of infection if unstable wound conditions develop, (5) whether adequate blood products are typed, crossed, and immediately available for transfusion, (6) presence of at least 2 large bore peripheral IVs, and (7) the half-life of IV tPA. While the half-life of IV tPA is < 5 min in the systemic circulation, tPA remains bound to fibrin in thrombi (whether in the brain or the surgical site) and continues to exert a more prolonged fibrinolytic effect (*Thromb Haemost*. 1987;57:35-40).