

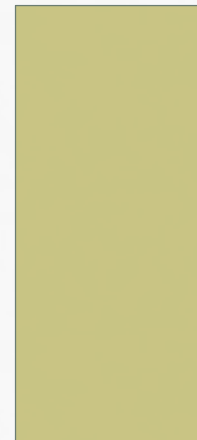
QI PROJECT: STROKE ALERT

11/25/2013

FANG YU, MD

ADVISOR: MARIA VALENCIA, MD

COLLABORATORS: APARNA SHARMA, MD; WAN-CHING LEE, MD; BLANCA POSADA; SYLVIA GAMEZ



INTRODUCTION

- Acute cerebral infarctions are a major cause of morbidity and mortality in this country, with an estimated 795,000 individuals experiencing either a new or recurrent event per year (Go AS, 2013). Central to management of this population is expedient transition to reperfusion therapy for tissue salvation, in the absence of contraindications.
- Current guidelines indicate that the efficacy of intravenous thrombolytic therapy is maximized within the first 4.5 hours after presentation, after which the risks from intracranial hemorrhage outweigh the benefits (Hacke W, 2008).

RATIONALE

- In light of the importance of a timely response for management of acute stroke patient, it seems only logical that each step in the process be optimized. In discussing the protocol with emergency medicine and neurology physicians (Drs. Wan Ching Lee and Aparna Sharma), the chain of action at University Hospital is such:
- Patient is admitted to the emergency room where she is evaluated by a resident or physician's assistant, and then the attending physician.
- If there is a clinical concern for an acute stroke, a **stroke alert order** is selected in Sunrise ®, usually by an Emergency medicine clinician.
 - This includes labs studies, nursing protocols, EKG, and a **CT of the head**.
- Neurology will assess the patient, and review the results of the CT scan with radiology.
 - If there is no evidence of intracranial hemorrhage, TPA will be administered assuming the patient falls within the time window and is confirmed to have findings compatible with a stroke.

RATIONALE

- The radiologist, however, is never notified of a stroke alert unless:
- The technician calls the radiologist to protocol the study.
- The on-call neurologist eventually arrives in the ER reading room asking for an interpretation.
- While other components of the protocol appear relatively streamlined, involvement of the radiology section was one capacity in which we could improve things. Although no major complaints or incidences have so far been reported by the neurology department to the knowledge of the author and the neuroradiology section, a conceivable scenario would be one in which a radiologist (particularly the ER resident in the evenings) was unaware of the hyperacute nature of a CT head study. Consequently, he or she may prioritize other non-emergent examination ahead of it. This could then substantially delay the workflow for appropriate stroke intervention, to the detriment of the patient, who may miss the thrombolysis window.

METHODS

- The matter was discussed with Dr. Sharma, who is a current neurology resident at our institution. Ms. Blanca Posada, who is the stroke coordinator for neurology, was then introduced to the project. Considerations included creating a landline to the ER reading room, however, this was felt to be needlessly intrusive, and unnecessary during the day time.
- An alternative consideration was then to implement a notification system in Centricity, which could be seen by any radiologist protocoling examinations. Additionally, this should also be visible in Synapse.

METHODS

- Through discussion with the team, which included the clinicians and coordinators mentioned, as well as Dr. Lee Birnbaum (neurointerventionalist), the solution was to integrate it with Sunrise under the existing stroke alert order set.
- This was performed by displaying a “stroke alert” as a “reason for examination/Special instructions” on the Sunrise order menu, which was implemented with the aid of Ms. Sylvia Gamez from the IT department. These are demonstrated in the figures attached.

RESULTS & DISCUSSION

- Since then, this change has been implemented into Sunrise and Synpase, and has been remarked upon by radiology residents and faculty. While quantitative data regarding its full impact may be difficult to ascertain, it may be hypothesized that there is a definite influence on patient care. Radiologists will be better able to triage head CTs that are ordered in the ER, particularly in the evenings/overnight.
- However, this benefit will be available to the daytime neuroradiology service as well. Additional considerations may also include the inclusion of an alert marker adjacent to the examination title on Synpase (although a potential concern is that other services/clinicians would want their [less emergent] exams tagged as well).
- Future work in optimizing the management of acute stroke from the radiology perspective may include the implementation of CT perfusion and/or a fast MRI stroke protocol.

STROKE ALERT - SUNRISE

Radiology Order Form - CT Head - MARQUIS, CELIA

ERUJ-EC ACUTE (M020) IDX, DEFAULT ADM: Nov-11-2013 DSC: Female

Allergies: ERYTHROMYCIN, GENTAMICIN, LISINAPRIL, TOBRAMYCIN, V...

Order: Head CT (- contrast) Order ID: 001MCSOTJ

Requested By: Template Name:

Messages: 5797.00/each

Exam Date: Nov-12-2013 Exam Time: STAT

Requested Service Location: University Hospital Emergency Center Transportation: Gurney

Standardized Indications:

Reason for Exam / Special Instructions: STROKE ALERT

Attending Physician: Isolation Type: No Isolation Needed

Last Menstrual Period: Service:

Patient Pregnant: Patient Requires Oxygen:

Diabetic Patient: IV Fluids:

Relevant Results:

Measurements				
Height (inches)	Height (cm)	Weight (lb)	Weight (kg)	BSA
64	162.6	127	57.6	1.61

Conditional Order: Max # of activations: Clear

Ordering Provider Information: Provider Name = Yu, Fang / UHS Number

Patient Prep:

Plan Name: MEDICARE/P203 Financial Classification: 1

Ordering MD Number: Attending Number: 99999

Repeat View Document OK Cancel

Figure 1: Sunrise order set menu for CT head, as part of the EC stroke alert order set. As indicated by the red arrow, the term "STROKE ALERT" auto-populates in the reason for exam tab.

STROKE ALERT - GE CENTRICITY

Centricity RIS-IC (V10.6.0.999 UP7) - YU,FANG - Microsoft Internet Explorer provided by University Health System

Worklist | Pt Rec | Scheduling | Provider | Home | Radiologist | Patients | Exams | Lookup | Signing | Protocol

DOB: [REDACTED] Age at Exam: 43 Y, 10 M Sex: M ACC: [REDACTED] Ex. Sts: S Dt/Tm: [REDACTED]
SSN: [REDACTED] Chart Loc: Enterprise Exam: CT HEAD WO CONTRAST ... Rpt. St: [REDACTED]
PCP: ZACHARY,VANCE,... Allergies: NO Requester: SPARKMAN, MARK... S/S: S

Clinical Exam Notes -- Webpage Dialog

Clinical Exam Notes Top of List Note 1 of 8 help close < >

DOB: [REDACTED] Age at exam: 43 Y, 10 M Sex: M MRN: [REDACTED]
ACC: [REDACTED] Exam: CT HEAD WO CONTRAST 70450 Org: UH
11/10/2013 [REDACTED] CST Ex. Sts: S Report Status: Pending Creation Perf. Resource: 1CTEC1

Clinical Info Memos

This patient has no active allergy records on file.

Protocols

Prior Exam Protocol: ** Select Prior Protocol ** save save & next

Quick Protocol List: ** Select Quick Protocol **

Protocol: YU, FANG 11/10/2013 6:30 PM CST

<input checked="" type="checkbox"/>	Code	Protocol Description	[Full]	Comments
<input type="radio"/>	CTNEUHD1	CT HEAD WO CONTRAST		

Diagnostic report text

Signs and Symptoms: STROKE ALERT\br\left weakness
History: Creatinine: 0.64 mg/dL (11/04/2013) BUN: 13 mg/dL (11/04/2013)
Comments:
Visit Pt Loc: M020 Phone:

Related Exams hide list all exams

	Org	Acc	Sts	Exam	Requester	Date/time	Mod	Anat	Resource
✓	UH	31857448	F	CT HEAD WO CONTRAST 70450	FOLLEY, AUSTIN	11/04/2013 6:50 PM	CT	HEAD	1CTEC1
✓	UH	31452957	F	CT HEAD WO CONTRAST 70450	EMANUEL, TERRY	12/19/2012 1:47 PM	CT	HEAD	1CTEC1

Figure 2: Screen capture of the GE Centricity protocol menu for a patient whom a Stroke Alert order set was obtained in Sunrise. As indicated by the red arrow, the term "STROKE ALERT" auto-populates in the "signs and symptoms" section.

STROKE ALERT - GE CENTRICITY

The screenshot displays the GE Centricity interface for a patient's protocol menu. The top navigation bar includes tabs for Worklist, Pt Rec, Scheduling, and Provider. The main content area shows patient information and a 'Clinical Exam Notes' window. The 'Clinical Exam Notes' window is titled 'Clinical Exam Notes -- Webpage Dialog' and contains the following information:

- Clinical Exam Notes** (Note 4 of 20)
- DOB: [REDACTED] Age at exam: 55 Y, 10 M Sex: M
- ACC: [REDACTED] Exam: CT HEAD W/O CONTRAST 70450
- 10/24/2013 [REDACTED] CDT Ex. Sts: C Report Status: Pending Creation
- Sex: M MRN: [REDACTED]
- Org: UH Perf. Resource: 1CTEC1

The 'Clinical Info' tab is active, showing the following details:

- This patient has no active allergy records on file.
- Diagnostic report text
- Signs and Symptoms: **STROKE ALERT** (indicated by a red arrow)
- History: Creatinine: 1.10 mg/dL (07/25/2012) BUN: 16 mg/dL (07/25/2012)
- Comments:
- Visit Pt Loc: M020 Phone:

Performing Provider Comments:

- Attending: DEFAULT, IDX
- Requester: MUCK, ANDREW E

Performing & Responsible Providers:

Name	Perf.	Cont.	Resp.	Signature
LOPEZ, CYNTHIA A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

<click to add new row>

Related Exams: No related exams found

Figure 3: Screen capture of GE Centricity protocol menu for a patient whom a Stroke Alert order set was obtained in Sunrise, after the radiologist has protocolled the examination.

STROKE ALERT - SYNAPSE

The screenshot displays the Synapse powerjacket interface for a patient. The window title is "Patient Information for [redacted] - CT HEAD WO CONTRAST 70450". The interface is divided into several sections:

- Unavailable Datasources:** Synapse Cardiovascular.
- Docs Table:** A table listing various imaging studies. The top row is highlighted in green and indicates a "Stroke Alert".
- UHS - Radiology Report:** A section containing patient and study details. The "Reason" field is set to "STROKE ALERT", which is pointed to by a red arrow.

Docs	Src	Match	Description	Study Date	Mod	# Img	Status	Accession #
Synaps e	100%		CT HEAD WO CONTRAST 70450	10/24/2013 3:26:11 AM	CT	37	Complete	31842060
Synapse	100%		XR CHEST 1 VIEW 71010	10/24/2013 3:13:43 AM	DX	1	Complete	31842059
Synapse	100%		XR ABDOMEN 2 OR MORE V 74020	8/14/2013 1:12:09 PM	DX	4	Finalized	31749809
Synapse	100%		XR CHEST 2 VIEWS 71020	3/27/2009 12:09:03 PM	CR	2	Finalized	22335355
Synapse	100%		XR CHEST 2 VIEWS 71020	2/12/2007 3:18:43 PM	CR	2	Finalized	21455194
Synapse	100%		XR CHEST 1 VIEW 71010	1/3/2007 5:03:08 AM	CR	1	Finalized	21412215
Synapse	100%		XR CHEST 1 VIEW 71010	1/2/2007 10:46:06 AM	CR	1	Dictated	21412214
Synapse	100%		XR CHEST 1 VIEW 71010	1/2/2007 5:05:09 AM	CR	1	Finalized	21411788
Synapse	100%		XR CHEST 1 VIEW 71010	1/1/2007 6:05:03 PM	CR	1	Finalized	21411969
Synapse	100%		XR CHEST 1 VIEW 71010	1/1/2007 7:14:40 AM	CR	1	Finalized	21411209

UHS - Radiology Report

Patient: [redacted] Ordering Physician: **Muck, Andrew**
ID: [redacted] Phone, Pager: **Phone: N/A Pager: N/A**
DOB: [redacted]
Age/Gender: **55Y, M** Primary Location: **M020**
Procedure: **CT HEAD WO CONTRAST 70450** Study Date: **10/24/2013 3:26:11 AM**
Accession #: **31842060** Order #: **001LZLKVY**
Report Status: **Unknown**
Reason: **STROKE ALERT** (indicated by a red arrow)

Report is not available at this time.

Figure 4: Screen capture of Synapse powerjacket for a patient whom a Stroke Alert order set was ordered in Sunrise, after the radiologist has protocolled the examination. The reason for examination clearly indicates "Stroke Alert" (red arrow).