QI PROJECT: STROKE ALERT
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).
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.
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.
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.
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.
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 protocoted the examination.
Figure 4: Screen capture of Synapse powerjacket for a patient whom a Stroke Alert order set was ordered in Sunrise, after the radiologist has protocoled the examination. The reason for examination clearly indicates “Stroke Alert” (red arrow).