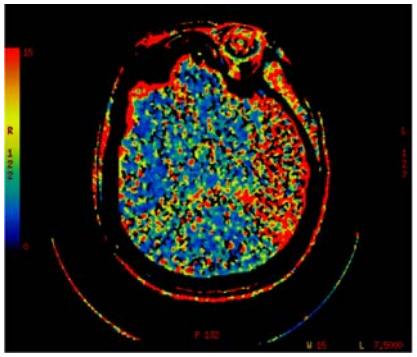
CT Imaging for Stroke Cases

The Problem

BIDMC Stroke Protocol sets standards for treating patients presenting to the ED with stroke symptoms. As part of the protocol, patients receive CT and CTA (computerized tomographic angiography) scans of the head to determine their diagnosis and best course of treatment. There is a 3-hour window starting from the onset of stroke symptoms in which a patient is eligible for treatment with thrombolysis. Following scanning, the challenge arises from time needed to process CTA images of the head. Neurologists utilize multiplanar reformatted and volume rendered images and perfusion maps to determine whether a patient would benefit from receiving clot busting medications. Every second counts with the goal of delivering rapid and efficient patient care through a multidisciplinary team approach.

a

b 

a. 3D VR reconstruction of the circle of Willis.
b. CT Perfusion image showing left stroke.

Aim/Goal

Our aim was to decrease the time to perfusion image availability to facilitate the opportunity for optimum treatment of our suspected stroke patients.

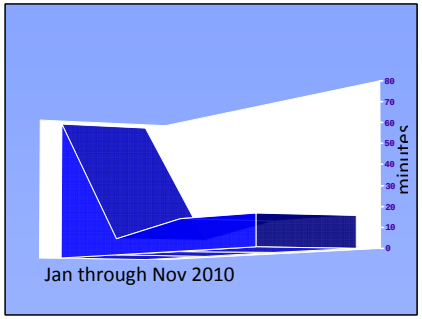
The Team

- Imaging Lab and CT Technologist
- Dr. Marc Camacho, Chief of Emergency Radiology
- Department of Neurology
- Emergency Department

The Interventions

- The off shift CT Technologist received Brain Perfusion 4 Software Processing training. Manuals were developed and staff was offered 1:1 training.
- Work flow prompts were added.
- A dashboard was developed so that the Imaging Lab Technologist could identify emergency stroke scans requiring immediate processing.
- The CT Technologist now pages the Stroke Team to notify them that the images are ready for viewing.
- A monitor with the ER tracking board was placed in the CT Control Room.
- Formal competencies were developed and implemented for the Imaging Lab and CT Technologist.

Progress to Date…



Our data showed that it was taking 78 mins to process the CTA MPR and we have reduced that time to ~16 mins.

Lessons Learned

- Communication between all involved team members is crucial for successful outcomes.
- Technologists learned the importance of timely image processing and their role in stroke patient care.

Next Steps/What Should Happen Next:

- Provide ongoing Code Stroke education for CT Technologists.
- Completion of formal competencies by all CT Technologists.
- Supervisors are working to get the night shift trained.
- Staff will be scheduled to regularly rotate through the imaging lab to maintain their proficiency in perfusion post-processing.

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