### Summary:
Streamlining the process for acute stroke patient evaluation and treatment using a multidisciplinary team approach.

### Hospital:
Reading Hospital

### Location:
Reading, PA

### Contact:
Mary Bilotta, RN
mary.bilotta@readinghealth.org

### Category:
- A: Arrival
- B: Bed Placement
- C: Clinician Initial Evaluation & Throughput
- D: Disposition
- E: Exit from the ED

### Key Words:
- Continuity of Care
- Imaging
- Point-of-Care-Testing
- Patient and Family Support
- Medication Services
- Emergency Medical Services

### Hospital Metrics:
- Annual ED Volume: 130,300
- Hospital Beds: 735
- Ownership: Non-profit
- Trauma Level: 2
- Teaching Status: Yes

### Tools Provided:
- Brain Attack Flowchart
- Brain Attack Room Diagram

### Clinical Areas Affected:
- Ancillary Departments
- Emergency Department
- Emergency Medical Services
- Consult Services
- Imaging
- Pharmacy
- Patient Transportation

### Staff Involved:
- Administrators
- Chaplaincy services
- Communications
- ED Staff
- IT Staff
- Nurses
- Pharmacists
- Physicians
- Registration Staff
- Technicians
Innovation
Early identification of the acute stroke patient is critical to decrease door to diagnostics and potential medication administration and intervention. To maintain our position as a Get with the Guidelines Gold-plus Achievement Award hospital, we recognized variability of Door to Needle tPA times for acute stroke patients.

Our innovation streamlined the process for acute stroke patient evaluation and treatment by using a multidisciplinary team approach, beginning with EMS through the ED visit and onto the inpatient unit.

Innovation Implementation
Our core team was comprised of, Kristen Sandel, MD, Associate Director, Emergency Medicine, Mary Bilotta, RN - Advanced Practice Nurse, Charles Barbera, MD, Chairman, Emergency Medicine, and Timothy Marks, RN, Division Director, Emergency Services.

EMS providers were educated concerning the acute stroke presentation and utilization of the Cincinnati Stroke Scale. Early notification via prehospital radio was emphasized in order to activate the Brain Attack Team via the LifeTouch system activation screen. Stable patients were transported directly to CT scan for evaluation by a dedicated Brain Attack nurse and ED physician. The patient’s weight was obtained immediately on transfer from EMS to an ED litter equipped with a bed scale. Dual NIH stroke scale and initial evaluation is performed in concert by the ED nurse and physician. Simultaneously, point of care testing, vital signs, and cardiac monitoring are instituted. CT imaging is acquired within 20 minutes of patient arrival and immediately interpreted and resulted by a radiologist.

During the acquisition of imaging, the ED physician and nurse are determining patient candidacy for tissue plasminogen activator (tPA) and/or neurointervention. At that time, the ED physician confers with the Brain Attack neurologist as to the potential outcome solutions. If the patient is deemed to be a candidate for thrombolytic therapy, pharmacy is notified and can immediately prepare and hand deliver the bolus and infusion dosing of tPA. The Brain Attack Neurologist evaluates the patient at bedside within 30 minutes of the initiation of tPA During the patient’s evaluation. In addition, a chaplain is available to spiritual and emotional support to the patient and family.

Results
Door to CT times
- Start of Intervention: Median 51 minutes
- First month after Implementation: Median 38 minutes

Door to Needle times
- Start of Intervention: Median 77 minutes
- First month after Implementation: Median 55 minutes (which is below the recommended AHA guidelines)

Timeline
The process was developed, piloted, and refined over a 6 month period. EMS education was performed over a 3 month period by ED physicians and nursing staff.

Innovation Implementation
It is an organizational goal for process improvement utilizing a multidisciplinary team approach for care of Brain Attack patients, emphasizing continuity of care and improved outcomes to move toward a Comprehensive Stroke Center. The Door to Needle initiative was the first step in streamlining the process to improve care of the acute stroke patient.

Cost/Benefit Analysis
The cost of implementing this program was nominal and included purchase of the bed scale, monitoring devices, and
reallocate point of care testing. We are continuing to evaluate the impact of this innovation to cost savings through decreased length of stay and improved patient outcomes.

Advice and Lessons Learned
1. Interdepartmental collaboration is key.
2. EMS and staff engagement was vital.
3. Improved communication among all involved personnel, including the patient and their family.

Sustainability
Review of quality metrics through interdisciplinary weekly forums to discuss potential for staff recognition, educational opportunities and rapid cycle improvements for successful patient outcomes. The stroke database is updated daily and each Brain Attack is reviewed by a physician and nurse for quality improvement opportunities.

Tools to Download
- Brain Attack Flowchart
- Brain Attack Room Diagram
Brain Attack Flowchart

EMS calls medical command physician and notifies of possible Brain Attack

- Physician activates brain attack on touchscreen
- Nursing notifies protocol or acute physician of possible Brain Attack

Patient Stable

- Patient is taken directly to ante-room in CT scan and placed onto litter with scale

Patient Unstable

- Patient stabilized in Acute room prior to CT scan

Patient is registered by fiscal and orders are placed by Brain Attack nurse

NIH stroke scale, vital signs, cardiac monitoring, labs and iSTATs drawn, brief physician evaluation

Non-contrast CT scan performed

- No Additional Imaging
- Additional Imaging Needed

Patient taken to Acute room for additional treatment

Patient has additional imaging with CTA/CTP

Bedside handoff from Brain attack nurse to bedside nurse with dual NIH scale