The Health Care Improvement Foundation
2015 Delaware Valley Patient Safety and Quality Award
Entry Form

1. Hospital Name

   Doylestown Hospital

2. Title Of Initiative

   Reducing door to drug time for stroke patients with EMS involvement

3. Abstract (Please limit this description to 250 words)

With the supporting 15 plus years of data showing "time is brain" and the benefit of earlier tPA for better functional outcomes, we felt compelled to reduce our median door to drug delivery time for stroke patients arriving via ambulance, which was hovering in the upper 60 minute range for the previous few years. In 2013, we recognized an opportunity to improve the coordination of patient care prior to hospital arrival by collaborating with EMS. We initiated a pilot study with our hospital's main EMS squad by having them call a pre-hospital stroke alert based on the onset of the stroke symptoms. After a few months, we expanded the intervention to include other local EMS companies. Through enhanced feedback and communication with the EMS squads, we have refined the process to further improve our goal of decreased door to drug time for tPA candidates. After two years since first piloting this process, pre-hospital stroke alerts that are called in from the field continue to increase in volume for stroke patients arriving via ambulance to our emergency department (ED), helping to significantly improve the percent of tPA candidates who receive the drug within 60 minutes of ED arrival (door to tPA) to 80.9% in 2015, as compared to baseline year 2013 (2013 door to tPA time: 40.0%, p=0.017).

4. What were the goals of your initiative?

   To decrease door to drug time for tPA candidates

5. What were your initiative's baseline data and the results of your initiative?

   In 2013 only five of fifteen of the stroke patients arriving by ambulance and ultimately receiving tPA had a stroke alert called from the field. The percentage of ambulance arrivals for which a stroke alert is called from the field increased from 33.3% in 2013, to 57.1% in 2014, and to 80.9% in 2015. The key process measures for stroke care are door to CT (goal: 25 min.), door to CT read (goal: 45 min.) and door to tPA (goal: 60 min). Baseline performance in 2013 for patients arriving by ambulance in terms of percentage meeting goal was: door to CT (86.7%), door to CT read (92.9%) and door to tPA in 60 minutes (40.0%). In mid-2013, interventions were piloted with one EMS squad and were expanded to include other local squads by the end of 2013. In 2014 the task force began to further refine and improve the processes involved in this initiative, which can be seen in 2014 and 2015 results: door to CT (2014: 93.9% n=14, 2015: 100% n=21), door to CT read (2014: 100%, 2015: 100%) and door to tPA in 60 minutes (2014: 57.1%, 2015: 80.9%). In addition, door to tPA in 45 minutes has improved for patients arriving by

ambulance (2013: 13.3%, 2014, 2014: 42.9%, 2015: 71.4%). Table 1 in the appendix show this improved performance in key stroke care measures by year.

We used Fisher's exact test to confirm statistical significance for the improved performance on door to tPA in 60 minutes and in 45 minutes between baseline year 2013 and 2015 performance to date. Door to tPA in 60 minutes for patients arriving by ambulance improved from 40.0% in 2013 to 80.9% in 2015, p= 0.017, and door to tPA in 45 minutes for these patients improved from 13.3% in 2013 to 71.4% in 2015, p=0.001.

6. Describe the interventions that were instrumental in achieving the results for your initiative.

Prior to this improvement initiative, the process for achieving the key goals in stroke care (as defined in the baseline data and results section) began when the ED physician identified a stroke patient via symptoms and time of onset. The physician would then call the "stroke alert", which is a phone call to notify the care team that a stroke patient has been identified. After the stroke alert is called, the care team prepares the department for this patient's necessary treatment. At our hospital, the stroke alert is what sets the stage for these patients to receive timely, evidence-based care. To achieve the goal of decreased door to drug time for tPA candidates, we recognized an opportunity to improve the coordination of patient care prior to hospital arrival by working closely with EMS. It was hypothesized that the timing of the key process measures related to stroke care, including door to tPA, would be decreased if the stroke alert was called from the field, rather than after the patient has been seen by the ED physician. Interventions carried out in order to impact our rate of stroke alerts from the field included:

• In May of 2013, we began to work with one EMS squad, piloting a study where EMS would call a pre-hospital alert based on the onset of stroke symptoms.
o EMS assesses a potential stroke patient via the Cincinnati Pre-Hospital Stroke Scale (CPHSS) and calls the stroke alert to the hospital, notifying the care team that a patient is arriving who could be a tPA candidate.
• The Continuous Quality Improvement (CQI) director for the EMS squads in our county and the Deputy Chief and Clinical Coordinator with the main EMS squad servicing our hospital began to participate on the Stroke Task Force, which is the leadership group that acts as the steering committee for the hospital's stroke program. The CQI director facilitates communication related to the Stroke Task Force to all EMS squads.
• By the end of 2013, the pilot study was expanded to include other local EMS squads.
• Internally, we used a 'stroke blast' after every stroke alert as a way of communicating with the stroke team to identify areas of success and areas of improvement. The stroke blast was augmented to with information regarding the EMS squad involved and whether a stroke alert was called from the field.
• The stroke blast is communicated out to each EMS squad to raise awareness of the outcomes for each stroke alert with their involvement.
• Specific feedback is provided to the EMS team who brought in the patient, including:
o Stroke care goal outcomes
o How the patient was medically treated
o The patient's final outcome and disposition

o Suggestions on how to further improve the stroke alert process

• Summarized results are communicated to the EMS squads to show data on their performance with and without stroke alerts from the field.

• Quality reviews on individual outliers or questionable cases are conducted with the Stroke Coordinator and the EMS squad. The review includes listening to the voice recording of calls to identify any areas where communication could have been improved.

7. How can this initiative be replicated through the region? (Please limit this description to 100 words.)

   All EMS companies can be educated on the utility of calling a pre-hospital stroke alert based on stroke symptoms being present and time of symptom onset. The hospital should provide feedback to the companies so that they can see how their involvement directly impacts the outcome of the patient. The stroke committee needs to include representatives from the EMS squads involved to ensure the stroke care goals and key events are communicated amongst EMS providers and to encourage their participation in defining, refining, and improving the process.

8. Explain how the initiative demonstrates innovation (Please limit this description to 100 words.)

   Improving the variation of clinical processes can be achieved by reducing the variability of each step in the process or by eliminating steps that are unnecessary. By encouraging EMS to call in stroke alerts from the field we have essentially eliminated a step in the process. Where in the past the patient is received in the ER and then the stroke alert is called, now the emergency department is fully aware of the stroke patient's imminent arrival. This has cut significant time out of the process and has not resulted in an increase of false alerts.

9. How does this initiative demonstrate collaboration with other providers within the continuum of care? (Please limit this description to 100 words.)

   The hospital's Stroke Task force collaborated with EMS to develop and refine the process for pre-hospital stroke alerts. EMS squad representatives are active participating members of this committee, where the latest trends in stroke care and the results of stroke care measures, including door to tPA times, are reported and discussed. For all stroke patients arriving via ambulance, the EMS squad receives a detailed report on the patient's outcomes, including the timing of stroke care measures, to facilitate a post-alert review and identify areas of improvement. EMS is actively involved in quality assurance reviews related to this process.

10. Explain ways in which senior leadership exhibited commitment to the initiative (Please limit this description to 100 words.)

    Senior leadership actively supports and participates in the Stroke Task Force and has funded the infrastructure that supports the improvement efforts for this effort. The Continuous Quality Improvement (CQI) director for the EMS squads in our county and the Deputy Chief and Clinical Coordinator with the main EMS squad servicing our hospital, participate on the hospital's Stroke Task Force.

11. Appendices (i.e., tables and graphs)

Stroke alert tin	Number of Stro	Number of Stro	% within goal (	% within goal (	% within goal (	% within goal (	Door to Drug - 45 Min)
2013	15	33.3%	86.67	92.86	40.00	13.33	
2014	14	57.1%	92.86	100.00	57.14	42.86	
2015	21	81.0%	100.00	100.00	80.95	71.43	

Table 1

Measure	2013 (Baseline)	2014	Jan - Jun 2015	p-value
Stroke Patients Arriving by Ambulance	15	14	21	
Stroke Alerts Called from Field	33.3%	57.1%	81.0%*	0.006
Door to CT in 25 Minutes	86.7%	92.9%	100%	
Door to CT Read in 45 Minutes	92.9%	100%	100%	
Door to tPA in 60 Minutes	40.0%	57.1%	81.0%*	0.017
Door to tPA in 45 Minutes	13.3%	42.9%	71.4%*	0.001

* Significant improvement compared to baseline