Development of a Hyperacute Stroke Unit at London Health Sciences Centre, Regional Stroke Centre

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Background
Hyperacute refers to care provided in the first 24 hours for stroke and 48 hours for TIA1. The focus of this phase is to diagnose the type of stroke, coordinate and deliver treatment as quickly as possible. University Hospital, the Regional Stroke Centre for Southwestern Ontario, receives approximately 700 stroke patients/year, who are admitted to the Clinical Neurosciences (CNS) Unit. In 2011/12 average door to needle time was 65 minutes, with patients waiting in ED for up to 11 hours.

Method
A business case was submitted to create a Hyperacute Stroke Unit (HSU) on CNS. Project management methodology was applied to develop the HSU over a 3 month period. Process mapping identified areas for improvement, and the need for increased awareness regarding "time is brain". Input was sought from all stakeholders including: EMS, ED, CNS, Imaging, and Labs.

Efforts were directed at:
• Expansion of fanout call from Switchboard to provide advanced notice to other key responders: CT tech, labs, and tPA RN.
• Purchase of alphanumeric pagers for key responders to expedite fanout call from switchboard.
• Preparation of tPA for administration by tPA RN instead of ED RN.
• Administration of tPA in CT Suite versus in the ED.
• Improved data collection through the creation of a physician documentation form and a tPA tracking form completed by the tPA RN.
• Quicker access to INR result. INR lab result expedites the tPA nurse via portable phone.

Education and Training: HSU tPA RNs received:
• 4 hrs. cardiac monitoring education
• 4 hrs. training which included:
  ▪ Care of hyperacute stroke patient
  ▪ tPA preparation and administration
  ▪ Management of complications post tPA
• 1 hr. training in the Simulation lab using case-based learning to apply knowledge and skills gained in the above areas, and further practice with tPA preparation and administration.
• A mock 1 week prior to the GO-LIVE date offered the team the opportunity to further clarify roles and process, and identify other gaps.

The role of the HSU tPA RN

Upon switchboard notification of an incoming stroke protocol, the tPA protocol proceeds to the ED with the tPA cart. The tPA RN facilitates key steps required for timely stroke care:
• Obtains accurate patient weight.
• Applies stat sticker to bloodwork bag.
• Calls CT with estimated time of arrival.

The ED RN remains as the primary nurse. The tPA RN accompanies the patient to CT, and starts to complete preparatory work for tPA administration if warranted i.e., determines dose calculation and programs the infusion pump. If the patient is a tPA candidate, the drug is mixed and administered in the CT suite. After the tPA infusion has started, the tPA RN becomes the primary nurse.

Results
A level 2, HSU opened on the CNS unit at University hospital on March 19, 2014. The HSU houses 2 +1 bed and is staffed by 3 level 2 trained RNs. One nurse is assigned to carry the tPA pager to respond to incoming stroke protocol patients from the ED. Since opening the HSU, door to needle times have improved. Patients are transferred to the HSU in 1-1.5 hrs.

Conclusions
Creation of a HSU has led to:
• Improved performance in the Hyperacute phase.
• Increased engagement and interest in stroke among the broader team.
• Improved door to needle times from 65 min to 34 min.
• Enhanced job satisfaction for CNS tPA nurses; and enhanced relationship with ED nurses.
• Immediate admission to HSU, and decreased stay in the ED.