

# 12 Key Best Practice Strategies

January 2017

TARGET:  
**STROKE**<sup>SM</sup>  
PHASE II

**Target: Stroke advocates the adoption of these 12 key best practice strategies for reducing door-to-needle times for intravenous alteplase in acute ischemic stroke.**

**1. EMS Pre-Notification:** Emergency

Medical Service (EMS) providers should provide early pre-notification to the receiving hospital when stroke is recognized in the field. EMS pre-notification of hospitals can significantly shorten time to brain imaging, reduce door-to-needle times with IV alteplase, and enhancing the number of eligible patients treated.

**2. Stroke Tools:** A Stroke Toolkit containing rapid triage protocol, clinical decision support, stroke-specific order sets, guidelines, hospital specific algorithms, critical pathways, NIH Stroke Scale, and other stroke tools should be available and utilized for each patient.

**3. Rapid Triage Protocol and Stroke Team**

**Notification:** Acute triage protocols facilitate the timely recognition of stroke and reduce time to treatment. Acute stroke teams enhance stroke care and should be activated as soon as there is hospital pre-notification from EMS personnel of a stroke patient or the stroke patient is identified in the emergency department. Rapid neurologic evaluation should be performed as soon as possible in ED or on the CT table.

**4. Single Call Activation System:** A single call should activate the entire stroke team. A single-call activation system for the stroke team is defined here as a system in which the emergency department calls a central page operator, who then simultaneously pages the entire stroke team, including notification to ensure rapid availability of the scanner for stroke protocol brain imaging.

**5. Timer or clock attached to chart, clip board or patient bed\*.** Acute ischemic stroke care requires an accurate, timely, coordinated and systematic evaluation of the patient. A universal clock visible to the healthcare providers is an enabling tool for improving the quality of care.

**6. Transfer Directly to CT Scanner\*:** Guided by pre-specified protocols, eligible stroke patients can, if appropriate, be transported from the ED triage area directly to the CT scanner for initial neurologic examination and brain imaging to determine alteplase eligibility, bypassing the ED bed. The stroke patient, treating physician and nurse, and alteplase go to the CT scanner with the patient or meet the patient there, the neurologic exam is performed on the CT table, and once the CT is read by the treating physician as non-hemorrhagic, the initial bolus alteplase is delivered while the patient is still on the CT table. Appropriate written protocols with explicit inclusion/exclusion criteria should be in place to ensure that patients requiring emergency medical assessment or stabilization are not directly triaged to CT. Alternatively, rapid assessment by the ED physician while the patient remains on the EMS transport gurney can be preformed to ensure hemodynamic/respiratory stability and to evaluate for other emergency diagnoses followed by transport to the CT scanner.

**7. Rapid Acquisition and Interpretation of Brain Imaging:** It is essential to initiate a brain CT scan (or MRI) as soon as possible after patient arrival. Consider initial CT interpretation by stroke neurologist and reserving advanced imaging for unclear cases only. At the minimum, the CT scan should be performed within 25 minutes of arrival and complete interpretation of the CT scan within 45 minutes of arrival to exclude intracranial hemorrhage prior to administration of intravenous alteplase.

**TIME LOST IS BRAIN LOST.**  
Learn more at [Stroke.org/TargetStroke](http://Stroke.org/TargetStroke).



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## 8. Rapid Laboratory Testing (Including point of Care Testing if indicated):

When indicated, laboratories such as glucose and for patients in whom coagulation parameters should be assessed because of suspicion of coagulopathy or warfarin treatment, INR (PT)/PTT results should be available as quickly as possible and no later than 30 minutes after ED arrival. If standard STAT laboratory turnaround times cannot meet this target, point-of-care testing in the ED can provide the data in the needed timeframe. Glucose testing by EMS in field or prior to arrival should be performed.

**9. Mix Alteplase Ahead of Time:** A useful strategy is to mix drug and set up the bolus dose and one-hour infusion pump as soon as a patient is recognized as a possible alteplase candidate, even before brain imaging. Early preparation allows alteplase infusion to begin as soon as the medical decision to treat is made. It is the policy of the drug manufacturer to replace, free of charge, medication that are mixed but not used in time-critical emergency situations like this. Check with your hospital pharmacy for the proper procedures that will allow you to use this strategy to shorten time to treatment without financial risk.

## 10. Rapid Access and Administration of Intravenous alteplase\*:

Once eligibility has been determined and intracranial hemorrhage has been excluded, intravenous alteplase should be promptly administered without delay. The alteplase should be readily available in the emergency department or CT scanner (if CT scanner is not located in the ED) and can be retrieved and dispensed directly by the ED and stroke neurology team. The initial alteplase bolus should be administered while the patient is on the CT table. Dosing charts and standardized order sets can also facilitate timely administration and minimize dosing errors.

**11. Team-Based Approach:** The team approach based on standardized stroke pathways and protocols has proven to be effective in enhancing the number of eligible patients treated and reducing time to treatment in stroke. An interdisciplinary collaborative team is also essential for successful stroke performance improvement efforts. The team should frequently meet to review your hospital's

processes, care quality, patient safety parameters, and clinical outcomes, as well as make recommendations for improvement.

**12. Prompt Data Feedback:**\* Accurately measuring and tracking your hospital's door-to-needle times, IV alteplase treatment rates in eligible patients, other time intervals, and performance on other stroke performance/quality measures equip the stroke team to identify areas for improvement and take appropriate action. A data monitoring and feedback system includes the use of the Get With The Guidelines-Stroke Patient Management Tool (PMT) and creating a process for providing timely feedback and recommendations for improvement on a case-by-case basis and in hospital aggregate. This system helps identify specific delays, devise strategies to overcome them, set targets, and monitor progress on a case-by-case basis.

The hospital administration should provide the resources and financial support to implement and maintain these strategies. Hospitals without local stroke expertise available 24x7 should explore building relationships with stroke centers to facilitate more timely evaluation, decision-making and treatment. Many hospitals have found telehealth solutions for image interpretation or clinical evaluation critical to building successful acute stroke teams.

See the Target: Stroke Manual for more information.

\* Target: Stroke Phase II survey results indicated these strategies were used less frequently by hospitals; yet these strategies are associated with significant reductions in DTN times.

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