



Stroke Centers Initiative and Update

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Case Presentation

On December 23, 2003, a 911 call was taken by the Chicago Fire Department dispatch service at 2:25 pm. The caller stated, “My husband is having a stroke, he can not move the left side of his body”. An ALS ambulance arrived at 2:34 pm and found the 67-year-old patient to be sitting in a chair with a BP 140/85, pulse 96, respiratory rate 16 and the inability to move his left arm or leg. His wife also noticed the left side of his face was “flat”. He was able to speak and denied headache, chest pain or shortness of breath. He had a history of hypertension, was on Labetalol and Lasix, with no allergies. The paramedics noted the time of onset for the symptoms to be 2:15 pm., which was agreed to by both the patient and his wife. The patient was placed on a cart, an IV was established, oxygen was applied, and the glucose was 98. The paramedics called into the base station at 2:48 pm, stating, “We have a probable stroke, with two out of three abnormal on the Cincy scale”.

Will this patient be taken to a designated primary stroke center? Why? How? What are JCAHO designated stroke centers?

Key Clinical Questions and Learning Points

What are JCAHO designated stroke centers? What is necessary to become one?

The concept for Primary Stroke Centers was initially presented in an article authored by the members of the Brain Attack Coalition published in JAMA 2000; 283:3102-3109. There are eleven key components to a primary stroke center, including the consideration of administering t-PA to qualified patients. JCAHO and ASA have partnered to establish a primary stroke center certification process, which is voluntary, and not an “add on” to the hospital accreditation process.

If a medical center wishes to become a Stroke Center there needs to be a committee within the institution that will push the process forward. The chairman of the committee can be an EM physician, neurologist, chief nurse on the stroke team or administrator. The members of the committee must involve EMS, EM, neurology, radiology, neurosurgery, nursing, ancillary departments (physical therapy, occupational therapy, laboratory) and administration.

The eleven main items to be addressed include; stroke team management, EMS, written protocol for care, EM involvement, formation of a stroke unit, neurosurgical involvement, naming a stroke center director, neuroimaging, laboratory services, monitoring outcomes and quality improvement and CME.

There are ten items that JCAHO will be monitoring, only the first four are being monitored during the trial period; **DVT prophylaxis, anticoagulation if the patient is in atrial fibrillation, the consideration of TPA (i.e. Documentation of why or why not), use of antithrombotics in first 48 hours**, lipid profile, swallowing test, discharge on antithrombotics, stroke education, smoking cessation, and plan for rehabilitation.

What do organized EM societies state regarding stroke center designation?

In general, these societies want several important points addressed. 1) We have a critical role in acute care. 2) We need to be a part of the process in the development of these plans. 3) We need to be as scientific as possible in developing these systems, monitoring their performance and modifying them going forward.

What is the potential role of emergency physicians in stroke teams?

While there are opinions that are both positive and negative from emergency physicians about the development of Primary Stroke Centers, most EM physicians who have worked with, and often helped develop, stroke teams find them to be of great value. If a stroke team is available 24/7 then the patient can be evaluated, and management options considered, in a timely fashion. The benchmark stroke team response time is 15 minutes. This allows the EM physician to manage this potentially critical patient with an expert and maintain control of the rest of the ED. One, now designated stroke center, had an EM physician who adamantly refused to participate in the process because he had concerns about the use of TPA in stroke patients. Ultimately, he was only required to call the stroke team when a stroke patient arrived and let them make the decisions and assume care of the patient, thus leaving contentious decisions to someone else. Calling a stroke team to the ED is not unlike calling the Trauma Team to the ED for a major trauma.

Will all hospitals eventually become designated Primary Stroke Centers?

That is up to the medical center. Any comprehensive ED with the required support services can become a Primary Stroke Center. Currently, only a handful have become JCAHO designated Primary Stroke Centers. As of February 2005 there are 88 designated Primary Stroke Centers in the US. 50 more are in process and there are approximately 5,000 hospitals in the US. California, Florida, Ohio and Pennsylvania have the most with seven each. Two states, Massachusetts and New York have state certification credentials for stroke centers. Florida, Maryland and Texas have legislation pending for state certification, which will follow the JCAHO requirements.

In the future, there will be a second designation for Comprehensive Stroke Centers which will be for tertiary care hospitals able to do invasive neuro-radiology, and study advances in stroke therapy. The date for beginning this has not been set.

Has it been proven that having a designated stroke team available to care for stroke patients from presentation in the ED through the hospital stay, improve stroke patient outcomes?

Yes. There is evidence that having a well-coordinated team that specializes in the care of stroke patients does improve stroke patient outcomes. Most of this evidence is from single sites reporting on their experiences before and after the establishment of a stroke team. Most report decreases in the time needed to evaluate these patients relative to the ASA benchmarks for the acute evaluation of patients (door to CT, door to CT read, door to therapy (thrombolytics)). There is evidence that centers with stroke teams do give thrombolytics more often (up to 10% of ischemic stroke patients) than the national average (approximately 3-5%). In addition, stroke teams have been shown to decreased complication rates (pneumonia, DVT) as well as decreased length of stay in the hospital.

Is there a role for starting thrombolytic therapy in the ED and transferring the patient to a designated stroke center (“drip and ship”)?

Yes. This may be the path taken by many rural hospitals, which are used to transferring major trauma and myocardial infarction patients from their Emergency Departments to larger tertiary care centers. Some rural EDs are starting thrombolytic therapy in their ED and then transporting these stroke patients to larger hospitals for stroke team management. This usually requires a well-established protocol that is agreed to by both the rural ED and the accepting tertiary care hospital. Frequently the director of the tertiary hospital stroke team will make site visits to the rural EDs to confirm the ability to adhere to the protocol. In order for this type of protocol to work effectively, the involved EMS group needs to be well trained in the diagnosis and treatment of stroke and its complications.

Has EMS bypass of the closest hospital in order to transport acute stroke patients to a designated primary stroke center been shown to improved patient outcome?

There is no definitive data on this subject. The answer will depend on whether or not it is possible to have a functional “stroke team” without being a designated stroke center. If a community hospital has a well-established protocol for treating stroke patients from arrival to discharge, with a full compliment of ancillary services (physical therapy, occupational therapy, psychologists), then outcomes may be similar to those seen at a JACHO certified stroke center. In most systems, EMS is not prepared to bypass the closest hospital in order to take acute stroke patients to a designated stroke center, nor are there mechanisms in place to handle hospital diversions or emergent inter-hospital transfers.

There is another side to this and that is that many cities and states are already enacting legislation to invoke bypass criteria. This may ultimately leave every hospital with the decision of whether or not to become a Primary Stroke Center. Lastly, not all hospitals have neurosurgeons or interventional radiologist, as new therapies develop these specialties may have more and more to do with the care of both ischemic and hemorrhagic stroke and therefore bypass to the centers that have these services may be in the best interest of the patient.

Can computerized clinical pathways incorporated into patient charts improve adherence to acute stroke management protocols?

It is well established that strict adherence to the NINDS protocol for the use of thrombolytics is necessary to maximize outcomes. Having well constructed clinical pathways that are strictly adhered to, such as maintaining NPO until a swallowing study can be performed, can only improve outcomes and will make the care these patients streamlined in the emergency department. Protocols and benchmark data exist for the treatment of pain, pneumonia and congestive heart failure. Most institutions have stroke protocols in place. Having universal benchmarks, such as time to CT head, maintaining NPO until a swallowing evaluation is complete, may be on the horizon.

Patient ED Treatment and Hospital Outcome

The patient arrived at the Emergency Department at 2:54 pm. The patient was met by a nurse, a doctor and an EM tech and taken to the resuscitation room. He and his wife stated they were cleaning the house when he developed sudden onset of left arm and leg weakness. They confirmed the onset time of 2:15pm. He again denied headache, neck pain, chest pain, SOB. He had been taking his hypertension medication regularly and denies any history of prior CVA, MI, or diabetes. His vital signs were BP 142/88, P 98, R 16, and T 99.2 F. HEENT: eyes were deviated to the right but came back to midline with command, PERRL, Ears clear, neck supple. Heart, lungs and abdomen were normal. Neurological exam: CN mild left facial droop, strength 5/5 R arm and leg, 1/5 L arm and leg, no light touch or pin prick sensation in the L arm and leg. NIHSS=17-18.

The stroke team was called at 3:05pm, and labs were drawn and sent. The patient went to CT at 3:20 pm and returned at 3: 41pm. The stroke team assessed the patient on return from CT and agreed with the diagnosis of CVA and NIHSS=18. The cranial CT reading was “negative for bleed, normal brain” at 4:03pm.

The patient was felt to be a good candidate for thrombolytics. The patient was advised of the risks and benefits. The patient, along with his wife refused thrombolytic therapy, stating “I want nature to take its course”. The patient was given 325 mg. of aspirin and admitted to the hospital. His 24 hour NIHSS=14. On discharge, 5 days later, NIHSS=10.