Mississippi Hospital Stroke Readiness Survey Report

Conducted by Information & Quality Healthcare
Funded by the Mississippi Department of Health
October 2005

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Executive Summary

In 2001 the death rate due to stroke in Mississippi was reported as approximately 22% higher than the United States rate. Mississippi leads the nation in cardiovascular disease mortality with 41% of all deaths related to CVD. Mississippi's stroke mortality rate is the fifth highest in the nation. In Mississippi, stroke is the third leading cause of death, accounting for 1,927 deaths or approximately 7% of the state's deaths in 2001.

The establishment of primary stroke centers has the potential to improve the care of patients with acute stroke. According to "Recommendations for the Establishment of Primary Stroke Centers" Aberts, M. J. et al, JAMA June 21, 2000, the definition of **a primary stroke center** is a hospital-based center that stabilizes and provides emergent care to acute stroke patients; transfers patients to comprehensive stroke centers or admits patients; and provides further care depending on the patient's needs and the center's capabilities. Key elements of primary stroke centers include acute stroke teams, stroke units, written care protocols, and an integrated emergency response system.

In order to assess the current status of Mississippi hospitals readiness to treat acute stroke patients and the interest of Mississippi hospitals in becoming designated primary stroke centers, the Mississippi Department of Health (MDH) partnered with Information & Quality Healthcare (IQH) in 2005 to conduct a stroke readiness survey of Mississippi acute care and critical access hospitals.

Objectives

1. To assess the current percent of Mississippi acute care and critical access hospitals ready to treat acute stroke patients based on the Brain Attack Coalition (BAC) criteria for establishing primary stroke centers

2. To determine the number of Mississippi acute care and critical access hospitals that are currently interested in becoming a designated primary stroke center

The outcome goal of this initiative is to develop a statewide system of stroke care for Mississippi to provide optimal care to all Mississippians regardless of where they live in the state.

Conclusions

There is a great deal of work to be completed in Mississippi to treat patients with acute stroke. The administration of this survey documents the need for initiation of the Brain Attack Coalition components and criteria related to administering quality stroke care in Mississippi hospitals. While many Mississippi hospitals reported having some of the Brain Attack Coalition criteria for primary stroke centers, very few had all of the important identified elements for providing quality acute stroke care.

Emergency treatment of stroke patients in the past consisted of observation of the patient while the stroke occurred and rehabilitation of functional limitations due to brain cell death resulting from the stroke. Because of recent discoveries, it is now known that hospitals must be able to be ready 24 hours a day, 7 days a week to treat acute stroke as a medical emergency.

Introduction

Background

In the United States stroke is the third leading cause of death for both men and women. Each year about 700,000 people living in America will suffer a new or recurrent stroke. This means, on average, a stroke occurs every 45 seconds. Stroke is the cause of about 1 of every 15 deaths killing nearly 163,000 Americans per year. It is estimated that in 2005 Americans will pay about $57 billion for stroke related medical and disability costs. [1]

Mississippi's stroke mortality rate is the fifth highest in the nation. In Mississippi, stroke is the third leading cause of death, accounting for 1,927 deaths or approximately 7% of the state's deaths in 2001. It is estimated that a similar number (about 2,000 Mississippians) have been left disabled. [2]

Between 1980 and 2001, stroke death rates for the United States as a whole declined by 40%, an average of 2.0% per year. Over the same 20-year period Mississippi's stroke death rate declined by 41%, an average of 2.3% per year. Despite the decline, Mississippi's rate of death due to stroke remains 22% higher than the United States rate. [2]

Randomized clinical trials and observational studies suggest that access to a stroke center would improve patient care and outcomes. The establishment of primary stroke centers has the potential to improve the care of patients with acute stroke. According to "Recommendations for the Establishment of Primary Stroke Centers" Aberts, M. J. et al, JAMA June 21, 2000, the definition of **a primary stroke center** is a hospital-based center that stabilizes and provides emergent care to acute stroke patients; transfers patients to comprehensive stroke centers; or admits patients and provides further care depending on the patient's needs and the center's capabilities. Key elements of primary stroke centers include acute stroke teams, stroke units, written care protocols, and an integrated emergency response system. Important support services include availability and interpretation of computed tomography (CT) scans 24 hours a day, 7 days a week and rapid laboratory testing. The definition of **a comprehensive stroke center** is a hospital-based center that provides extensive care to the most complex stroke patients, including tertiary care, that involves all levels of care provided at medical centers and hospitals with the infrastructure and personnel available to perform highly technical procedures. Administrative support, strong leadership, and continuing education are also important elements for stroke centers. Adoption of these recommendations has the potential to increase the use of appropriate diagnostic and therapeutic modalities and reduce peristroke complications thereby saving lives and reducing the disabilities of persons experiencing acute stroke. [3]

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[1] Stroke Facts 2005: All Americans published by the American Stroke Association

[2] 2005 Mississippi Department of Health Stroke Data

[3] Aberts, M. J. et al, Recommendations for the Establishment of Primary Stroke Centers, JAMA, June 21, 2000, Vol 283, No. 23 pp 3102-3109

Many hospitals do not have the necessary infrastructure (personnel and equipment) and organization required to triage and treat patients with stroke rapidly and efficiently. The extreme sensitivity of neuronal tissue to even brief periods of ischemia mandates that stroke be treated as a medical emergency. Therefore, it is crucial for Mississippi hospitals to be ready to treat acute stroke patients.

Purpose

In order to assess the current status of Mississippi hospitals readiness to treat acute stroke patients and the interest of Mississippi hospitals in becoming designated primary stroke centers, the Mississippi Department of Health (MDH) partnered with Information & Quality Healthcare (IQH) in 2005 to conduct a stroke readiness survey of Mississippi acute care and critical access hospitals.

Objectives

Short term:

1. To assess the current percent of Mississippi acute care and critical access hospitals ready to treat acute stroke patients based on the Brain Attack Coalition criteria for establishing primary stroke centers

2. To determine the number of Mississippi acute care and critical access hospitals that are currently interested in becoming a designated primary stroke center

Long term:

1. To develop a statewide system of stroke care for Mississippi

Methodology

Representatives from the Mississippi Department of Health, the American Stroke Association, and Information & Quality Healthcare designed a 57-question survey based on the Brain Attack Coalition criteria for establishing primary stroke centers. A draft of the Hospital Stroke Readiness Survey was given to three local physicians with expertise in stroke care and treatment for review and input. The final draft was mailed to the Mississippi Hospital Association and the Mississippi Department of Health for further review and approval prior to distribution to Mississippi hospitals.

After numerous revisions and approval from all involved, the Hospital Stroke Readiness Survey was mailed with a cover letter (see appendix for the survey and cover letter) on April 27, 2005, to previously identified quality improvement contacts at Mississippi acute and critical access hospitals.

To assure that hospital administration and other involved personnel were aware of the survey and were comfortable that it was authentic, an article about the survey being conducted and the need for completion was placed in the Mississippi Hospital Association "NewsWeekly" newsletter. Because of the need for a statewide assessment of hospital stroke readiness, a 100% survey response rate was desired. To achieve this response rate, multiple reminders were sent to the hospital contact person through mail, e-mail, telephone calls, and personal contact including having the survey available at an IQH hospital statewide meeting in Jackson.

The timeframe for administration of the survey was from April 27, 2005, until August 26, 2005. By May 31, 2005, only 34 of the expected 95 completed surveys had been received. During the next few months, three e-mail reminders were sent to the specific contacts with telephone calls made to about 30 of the contacts to obtain information and complete the survey by telephone. At the end of the timeframe, Hospital Stroke Readiness Survey information had been obtained from all 95 (100%) acute care and critical access hospitals.

The survey was administered in hard copy format due to the document being too large to e-mail to involved hospitals. Once the surveys were received back from the hospitals, they were reviewed for completeness. Those hospitals who submitted surveys with questions left unanswered or with not applicable (NA) written in beside the yes or no choice were contacted by phone to obtain correct, completed information.

Completed surveys were scanned into an AutoData survey system named ExpertScan. ExpertScan is designed to create scannable forms, scan and process data, and generate and analyze reports.

IQH analysis department staff completed further analysis of the Hospital Stroke Readiness Survey. The data analysis of the 95 completed surveys can be found in the Findings and Results section of this report.

Inclusion Criteria

All Mississippi acute care and critical access hospitals were surveyed for this report. The exact number of acute care and critical access hospitals in Mississippi changes frequently for multiple reasons such as closure, mergers or formation of hospital systems, and change in status from acute care to specialty care. During the time of survey administration, there were 94 designated acute care and critical access hospitals operating in Mississippi. This report included 95 surveys because one hospital system having two hospital sites located in different cities requested that the survey be completed at both hospitals.

All hospitals were surveyed, including those that do not have a designated emergency department. All facilities were asked to complete the survey and document the lack of an emergency department in the comment section of the survey.

Exclusion Criteria

Non-Mississippi hospitals and Mississippi hospitals designated as rehabilitation hospitals and other specialty hospitals not delivering acute care were excluded and were not surveyed.

Findings and Results

The Brain Attack Coalition criteria for establishing primary stroke centers are as follows:

- An acute care stroke team in place 24 hours a day, 7 days a week
- Written acute stroke care protocols for patients with ischemic and hemorrhagic stroke
- A system for rapid notification and activation of a team
- The capability of hospitals to perform neuroimaging 24 hours a day, 7 days a week
- Rapid laboratory testing and reporting
- The ability to communicate with EMS personnel in pre-hospital setting
- An integrated emergency response system
- Provision of continuing acute stroke education for professionals
- Provision of acute stroke public educational programs
- Stroke support groups

While many Mississippi hospitals reported having some of the above criteria, very few had all of the important identified components for providing quality stroke care.

Acute Stroke Teams

Nine of the ninety-five Mississippi hospitals (9.5%) reported having a designated acute stroke team with only eight (8.4%) designated acute stroke teams available 24 hours a day, 7 days a week.

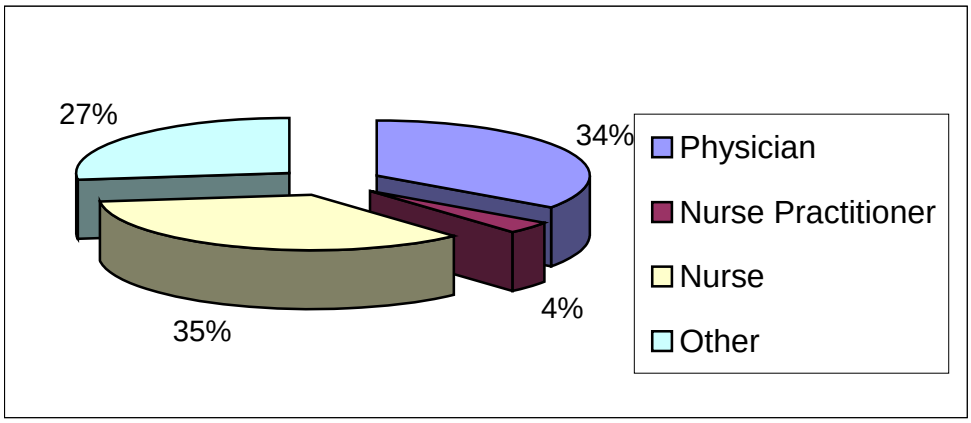
Survey Question	Yes	%	No	%
Acute Stroke Team	9	9.5%	86	90.5%
Available 24 hrs 7 days	8	8.4%	87	91.6%

Current literature supports the importance of designated acute stroke teams. It is the role of these teams to provide quality care for cerebrovascular patients.

Acute Stroke Team Members

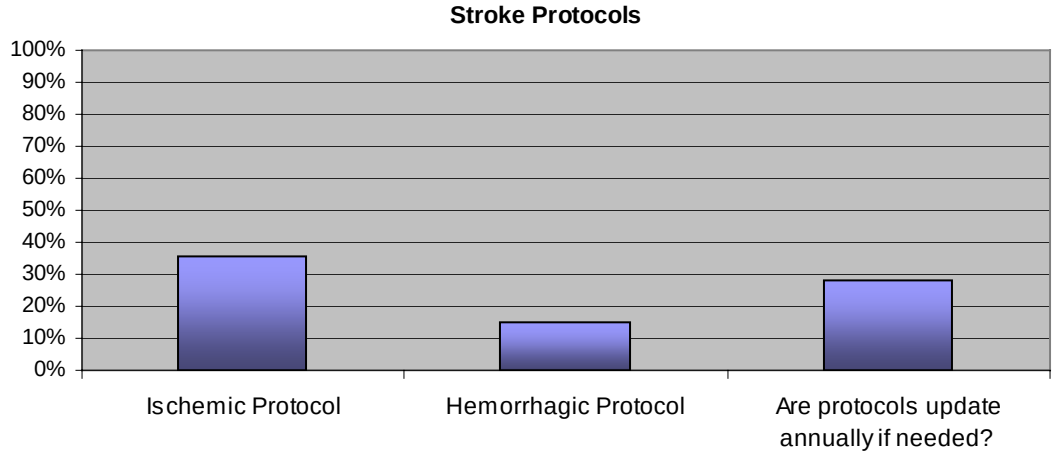
Eight of the hospitals with a designated acute stroke team have a staff person designated as a coordinator. Five of the acute stroke team coordinators were identified as being nurses with three being physicians (two neurologists and one hospitalist).

Emergency room physicians, neurologists and nurses make up the majority of the acute stroke team members identified. One facility included an acute care nurse practitioner. It is recommended that an acute stroke team include expert personnel with experience in diagnosing and treating acute stroke.



Ischemic and Hemorrhagic Stroke Protocols

Thirty-four hospitals (35.8%) have written acute ischemic stroke protocols with 14.7% reporting having acute hemorrhagic stroke protocols. A total of 27 hospitals (28.4%) reported reviewing their acute stroke protocols annually and updating the protocols if needed.



Ischemic Stroke Protocol Components

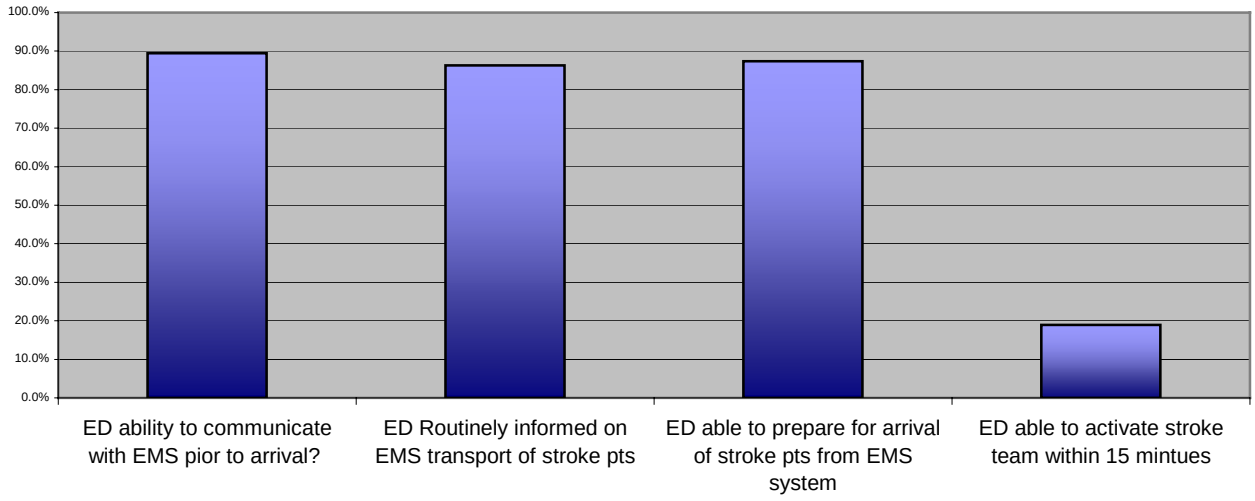
Written care protocols have been shown to increase the quality of medical care at the facilities where they are utilized. These protocols should be based on current clinical guidelines developed by a multidisciplinary team and reviewed and updated at least once per year.

Thirty-four of Mississippi hospitals (35.8%) reported having a written protocol for the care of patients with ischemic stroke. Nine hospitals with ischemic stroke protocols include a mechanism for contacting their acute stroke team. Eight of the hospitals (8.4%) have written protocols for the rapid activation of an acute stroke team within 15 minutes of request for service.

Emergency Medical Services (EMS)

Emergency medical services (EMS) personnel are usually the first to triage and assess the patient in the field; therefore, they are an integral component of a primary stroke center. The Brain Attack Coalition recommends that the integration of an EMS system with a primary stroke center should be documented by a formal or written plan of action. This plan of action should include directions for EMS transportation and receipt of acute stroke patients. There should also be a signed agreement between the stroke center and the EMS system that includes educational activities for EMS personnel at least twice a year.

Over 80 Mississippi hospitals reported the ability to communicate with EMS personnel and prepare for arrival of acute stroke patients.



Because of the lack of available stroke teams, very few emergency departments have the ability to activate stroke teams within 15 minutes of request for service.

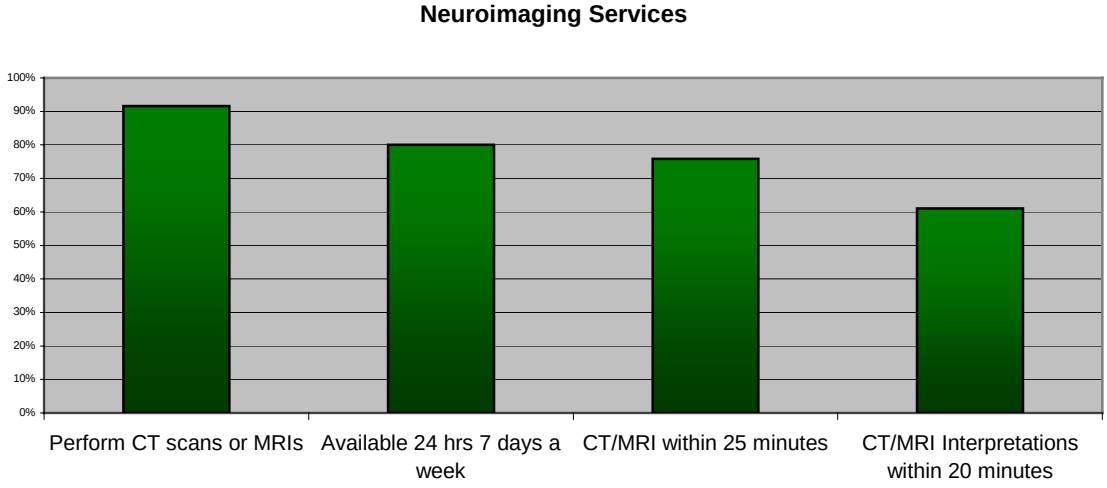
Neuroimaging Services

An ischemic stroke occurs when there is a sudden interruption in the blood supply to a part of the brain caused by a block in a blood vessel due to a thrombus or blood clot. About 80% to 85% of all strokes are ischemic with the remaining 15% to 20% hemorrhagic. During a hemorrhagic stroke, the interruption in the brain's blood supply occurs because of an arterial break or bleeding into the brain.

The most widely recognized treatment for acute ischemic stroke is Tissue Plasminogen Activator (tPA) that was approved by the FDA for acute ischemic stroke treatment in 1996 (American Heart/Stroke Association, 2005). This drug is the only treatment for acute ischemic stroke that has been approved by the FDA. When used to treat ischemic stroke, tPA must be given within three hours of the initial stroke symptoms.

Tissue Plasminogen Activator is a potent blood thinner and cannot be given for patients who are experiencing a hemorrhagic or bleeding into the brain stroke. Therefore, tPA can only be given once a stroke patient has been examined in the emergency department by CT brain scan to rule out a hemorrhagic stroke.

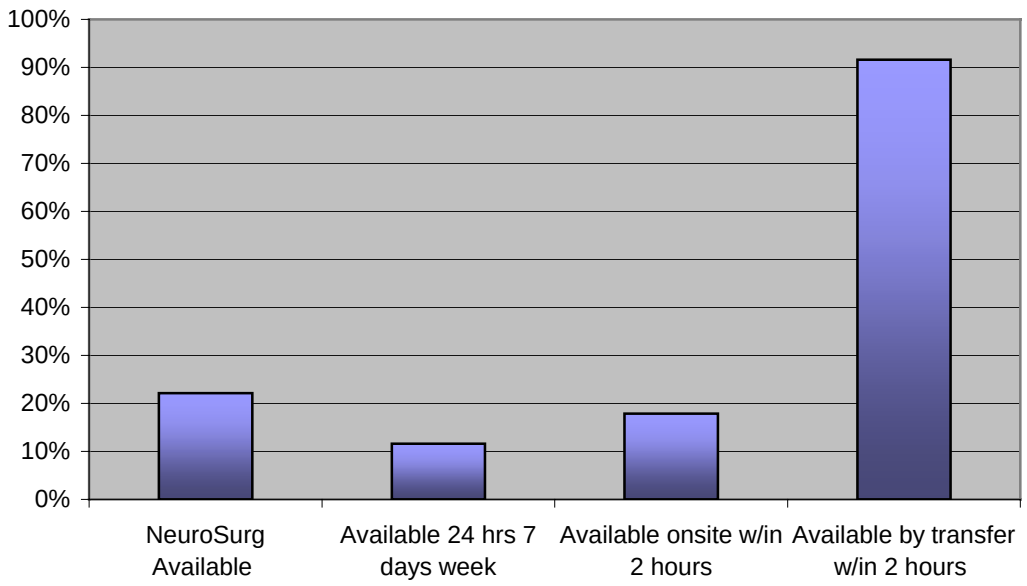
Eighty-seven Mississippi hospitals have the ability to perform a CT scan and/or a brain MRI. These services are available 24 hours a day, 7 days a week at 76 Mississippi hospitals. Eighty-three percent or 72 hospitals are able to complete the CT/MRI scans within 25 minutes of being ordered. Interpretations by a physician with experience in acute stroke are available within 20 minutes of scan completion at 58 Mississippi hospitals. For the number of hospitals meeting all criteria, see page 16.



Neurosurgical Services

The state of Mississippi appears to be lacking in neurosurgical services. Only 21 (22%) of the hospitals surveyed have neurosurgical services available. Eleven of these facilities have these services available 24 hours a day, 7 days a week. The service is available onsite within two

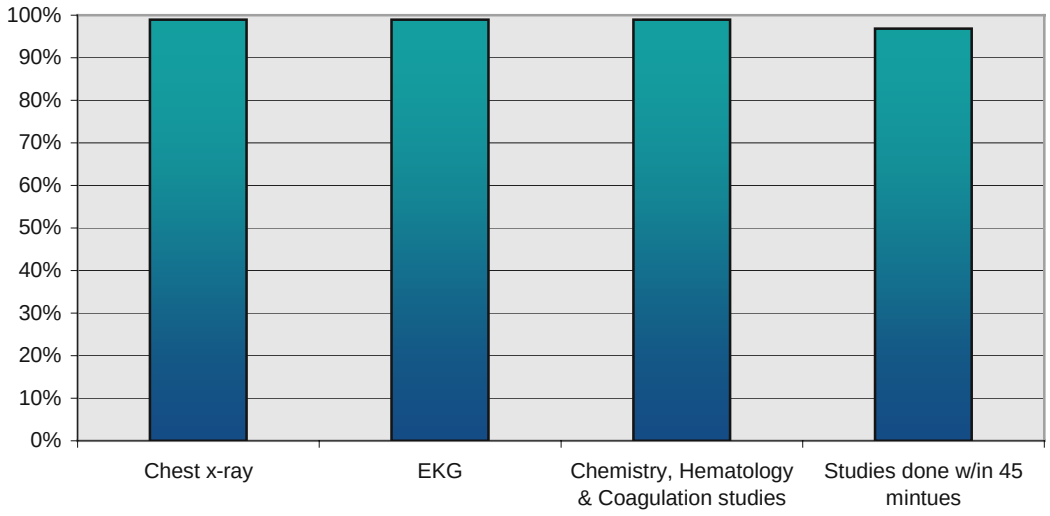
hours at seventeen hospitals with 87 hospitals (92%) reporting that the service is available by patient transfer to another hospital within two hours.



The Brain Attack Coalition recommends that a primary stroke center must be able to have neurosurgical care available within two hours of when the care is deemed clinically necessary.

Other Lab and X-ray Services

A primary stroke center should be able to perform and complete within 45 minutes standard lab tests, X-rays, and EKG services 24 hours a day, 7 days a week.

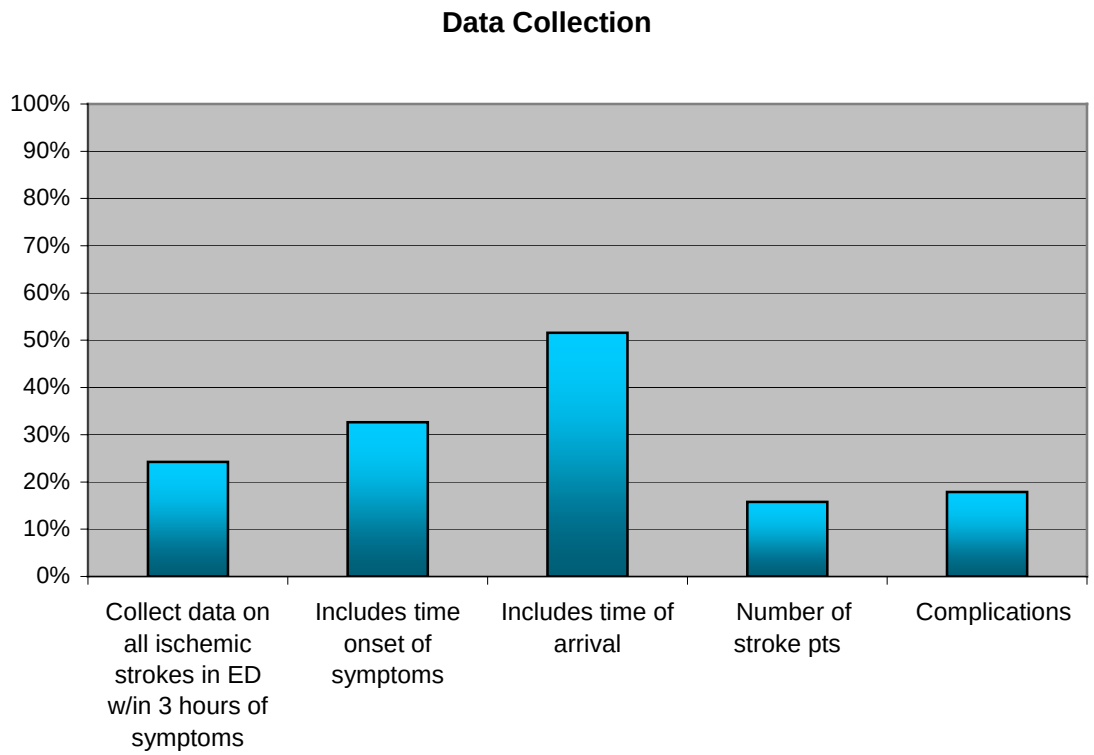


Standard lab tests, EKGs, and chest x-rays are being performed at 94 of the hospitals in the survey, with 92 hospitals having the capability to perform these services rapidly (within 45 minutes of order).

Quality Improvement Data Collection

The majority (81%) of Mississippi hospitals have an ongoing system to collect and analyze quality improvement data. These data are collected to monitor the effectiveness and safety of services and to identify and make changes to improve patient care. Currently many facilities do not have the resources to collect data that is not required for CMS or part of Joint Commission on Accreditation of Healthcare Organizations (JCAHO) core measures. The collection of quality improvement data for patients experiencing an acute stroke is not included in the required JCAHO core measures. Centers for Medicare & Medicaid Services quality improvement projects related to the care for acute stroke patients ended several years ago.

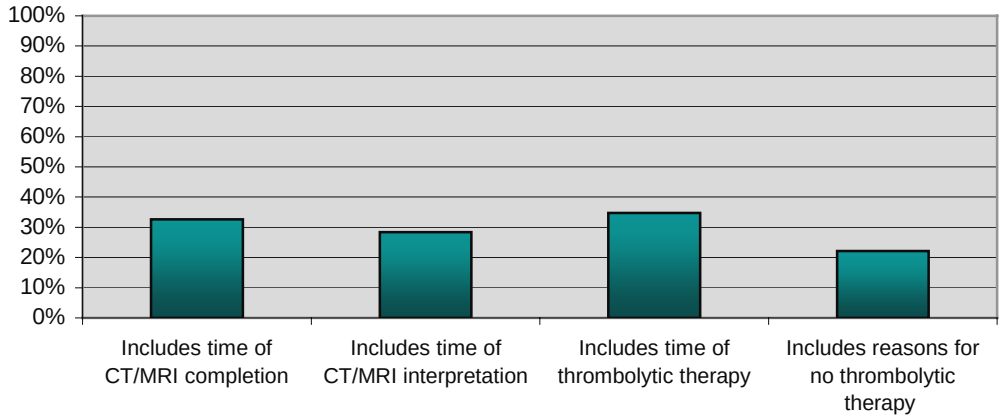
A stroke center database is needed to track the timeliness and quality of the care received by patients experiencing an acute ischemic stroke.



The graph above shows that data for patients experiencing an acute ischemic stroke are being collected in less than one third of the hospitals. Almost one half of the hospitals collect the time

the patient arrived in the emergency room. Of interest, the time the patient arrived in the emergency room is necessary to monitor current CMS quality improvement project indicators.

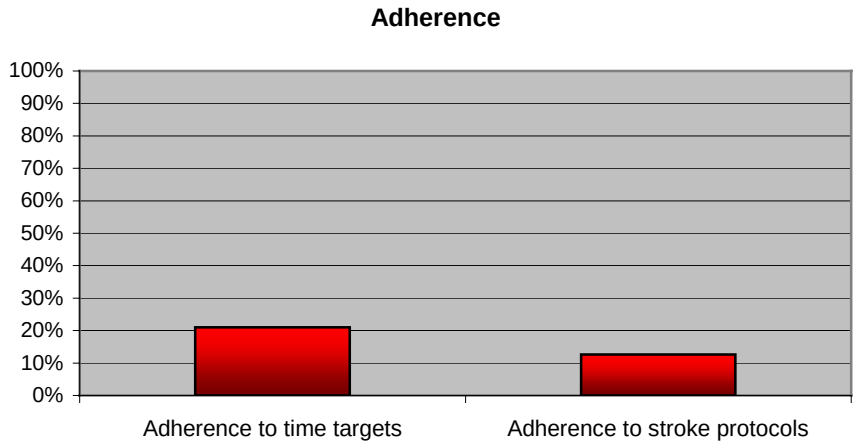
Data Collection



The graph above shows that less than one third of the hospitals collect data on the time of completion and interpretation of CT/MRI and the time of initiation of thrombolytic therapy or reasons for not administering thrombolytic therapy.

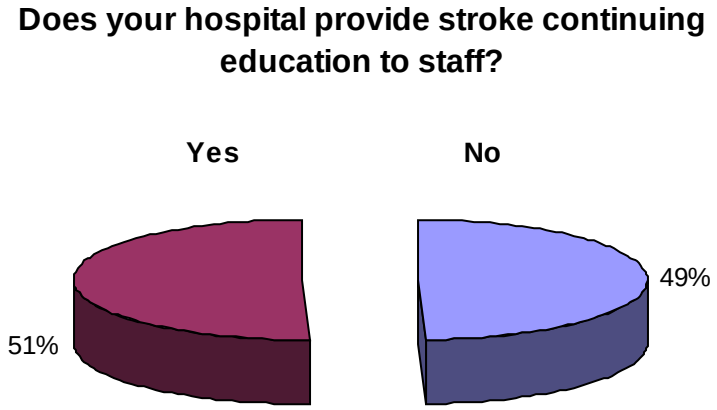
Mississippi hospitals were asked about an ongoing service review of the care of acute stroke patients which included adherence to time targets related to completion and interpretation of specific services. These time targets included in the hospital readiness survey are as follows: written procedures that allow for rapid notification and activation of stroke team within 15 minutes of request for services, ED personnel able to notify and activate the stroke team within 15 minutes of request for service, CT/MRI performed within 25 minutes of being ordered, CT/MRI interpretations available within 20 minutes of scan completion by a physician with experience in acute stroke, neurosurgical service available on-site within 2 hours of when deemed clinically necessary, neurosurgical service and evaluation available by patient transfer to another hospital within 2 hours of when deemed clinically necessary and capability to perform chest x-ray, EKG and routine lab within 45 minutes of order.

The timeliness of diagnosis and treatment of acute stroke patients is necessary to save brain cells and decrease long term disabilities.



Very few hospitals collect data on adherence to recommended time targets and stroke protocols. Data collection provides systems with the ability to review the quality of care provided and take action when needed. Positive outcomes and decreased morbidity and mortality due to acute stroke are dependent on data collection.

Professional Education

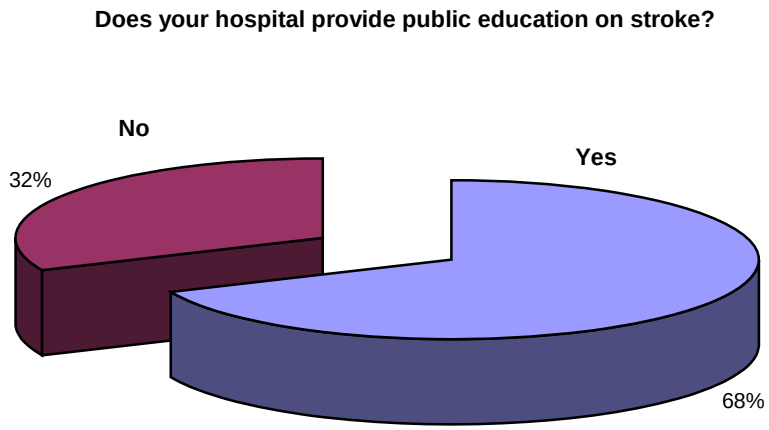


Less than one-half (49%) of the hospitals provide continuing professional education in stroke prevention, diagnosis, and treatment for their professional staff (nurses and physicians). Because of the rapidly changing nature of diagnosis and management of the acute stroke patient, it is recommended by members of the Brain Attack Coalition that professional staff receive at least eight hours of continuing education per year.

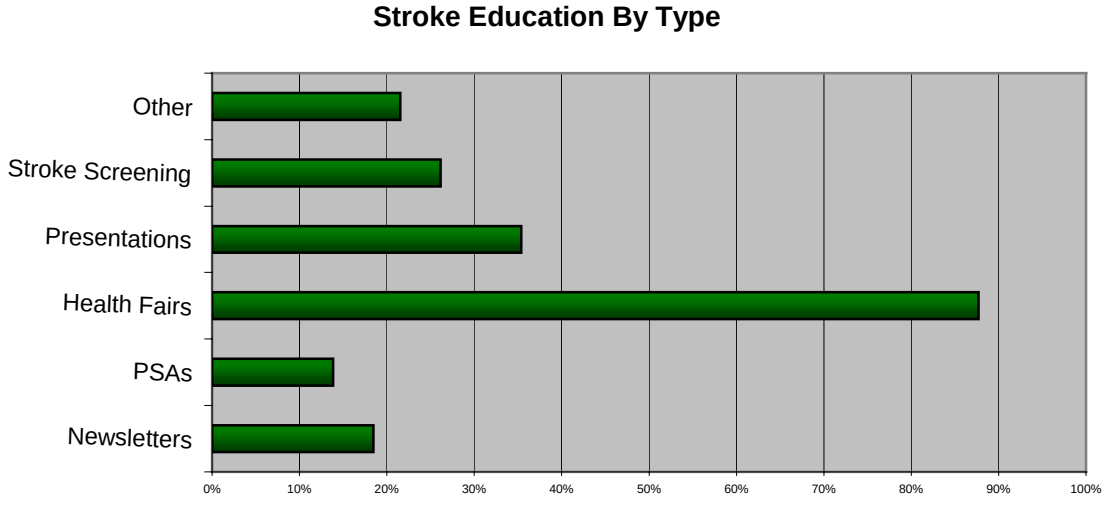
Education for Stroke Survivors and Their Families

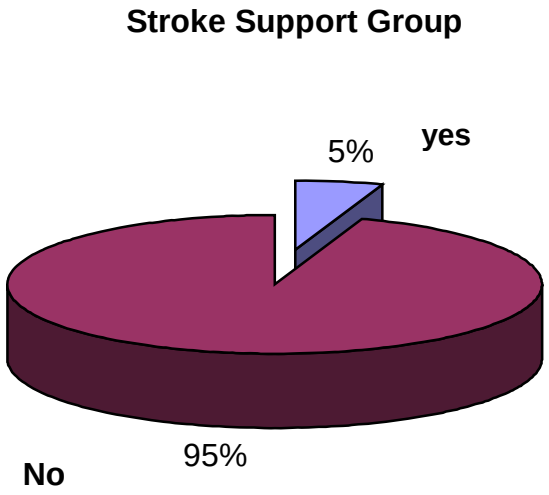
Tissue-type plasminogen activator (tPA), the only current FDA approved treatment for acute

ischemic stroke, must be given within three hours of the initial symptoms of a stroke. Considerable public education is needed to increase the awareness of signs and symptoms of stroke, to facilitate the rapid response to stroke as a medical emergency, and to facilitate the utilization of 911 emergency systems to ensure fast, timely treatment and save brain cells.



Sixty-five hospitals reported that they provide public education on stroke prevention, symptom recognition, and acute therapies. The survey requested that all forms of public education be reported. Most of the hospitals (88%) conducted health fairs, 35% conducted presentations, 26% conducted stroke screenings, 18% provided newsletters, 14% provided public service announcements, and 22% reported conducting another type of public education not listed on this survey.

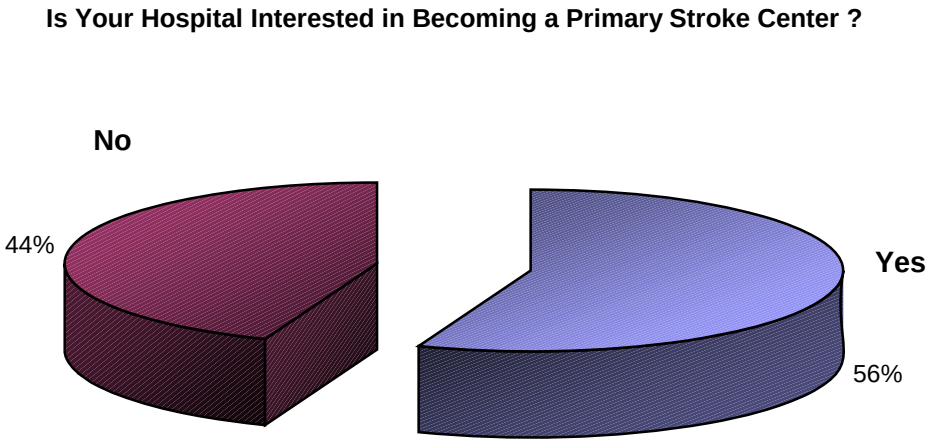




Stroke support groups must be a part of the rehabilitation process of every acute stroke survivor. Only five hospitals reported that they provide an ongoing stroke support group for stroke survivors and their families. Once a stroke occurs, recovery lasts a lifetime. Stroke survivors and families desperately need ongoing support to facilitate recovery.

Interested in Becoming a Primary Stroke Center

Fifty-three facilities reported an interest in becoming a primary stroke center using the following definition: a primary stroke center is a hospital-based center that stabilizes and provides emergency care to acute stroke patients, transfers patients to a comprehensive stroke center, or admits patients and provides further care depending on the patients' needs and center's capabilities.



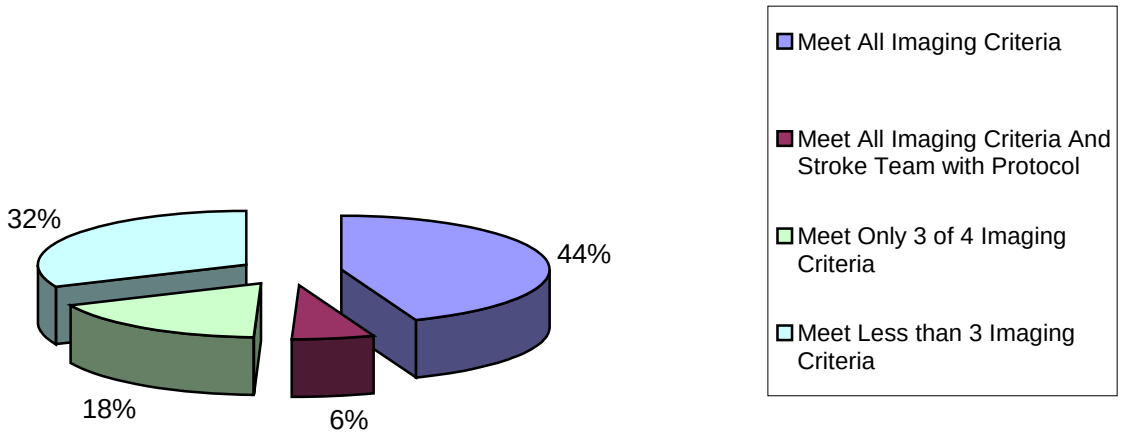
Key Components

Forty-eight Mississippi hospitals reported that they meet the following criteria that are essential components of a primary stroke center.

- CT/MRI Available
- CT/MRI within 25 minutes
- CT/MRI Interpretation within 20 minutes
- CT/MRI Available 24 hours a day, 7 days a week

Six hospitals reported that they provide all of the above neuroimaging services and have a designated stroke team and written ischemic stroke protocols. Seventeen hospitals meet three of the four neuroimaging services criteria. Thirty Mississippi hospitals meet less than three of the neuroimaging services criteria listed above.

The following graph shows the current status of Mississippi hospitals in relation to the above key components for a primary stroke center.



Additional Resources Needed to be Designated as a Primary Stroke Center

Written comments indicated that additional resources reported as needed by Mississippi hospitals

to be designated a primary stroke center include an acute stroke team, stroke protocols, resources (personnel and funding) and neurosurgeons.

Conclusions and Recommendations

There is a great deal of work to be completed in Mississippi to treat patients with acute stroke. The findings of this survey show the need for initiation of the Brain Attack Coalition components and criteria related to administering quality stroke care in Mississippi hospitals. While many Mississippi hospitals reported having some of the Brain Attack Coalition criteria for primary stroke centers, very few had all of the important identified components for providing quality acute stroke care.

In the past, emergency treatment of acute stroke patients consisted of observation of the patient while the stroke occurred and rehabilitation of functional limitations because of brain cell death resulting from the stroke. It is now known that hospitals must be ready 24 hours a day, 7 days a week to treat stroke as a medical emergency.

There were only six Mississippi hospitals identified as having some of the most important components of the Brain Attack Coalition criteria. These components include: a designated stroke team; written stroke protocols; CT/MRI available 24 hours a day, 7 days a week; timely completion of the CT/MRI; and timely interpretation of the CT/MRI by a physician with experience in acute stroke.

Comments from the survey documents that in some of the hospitals with no formal stroke team, ER personnel and "Code Gray" criteria are being utilized for the care of acute stroke patients ("Code Gray" identifies potential stroke victims in the field so that a team of experts can provide faster diagnosis and treatment for stroke patients.)

The Hospital Stroke Readiness Survey increased interest among health care providers in administering quality stroke care. Many of the hospital representatives contacted stated that they are in the process of updating and beginning new procedures and protocols related to stroke care. One facility stated that it was in the process of completing an application to be certified as a primary stroke center by JCAHO.

Recommendations

Recommendations to improve the quality of acute stroke care in Mississippi includes:

- Form an adjunct committee of the Mississippi Task Force on Heart Disease and Stroke Prevention designated to develop a statewide stroke system of care for Mississippi

- Promote hospitals to become designated as primary stroke centers based on the recommendations of the Brain Attack Coalition needed for certification by JCAHO

- Promote integration of acute care hospitals and emergency medical services to facilitate education of personnel, timely appropriate treatment and diagnosis of acute stroke patients

- Assist hospitals with training and support to become primary and/or comprehensive stroke centers

- Publicize the findings of the Hospital Stroke Readiness Survey to health care providers to promote an understanding of the lack of available stroke support groups, stroke teams, timely neuroimaging, neurosurgeons and stroke protocols in Mississippi

- Promote public education on stroke prevention, symptom recognition, what to do if a stroke occurs and available treatment

- Develop and disseminate materials and interventions designed to promote stroke education and training at all levels, public and professional

Lessons Learned and Barriers

The Hospital Stroke Readiness Survey was administered hard copy by regular mail due to the survey scan file being too large to e-mail to recipients. Not being able to send the survey electronically caused the following problems:

- Incomplete surveys - to obtain responses for all of the survey questions, a lot of time was spent having to call those hospitals that left questions unanswered and did not complete the survey.

- Surveys with extra responses written - Not Applicable or NA was not given as an option intentionally for this survey. Because of the survey being completed "hard copy," several surveys were received with NA written in beside the yes/no options. Much time was spent having to call these hospitals for yes or no answers.

- Some questions were answered that would not have been allowed to be answered in an electronic survey because of automatic skip commands in the program. Extra time was spent calling hospital contacts to correct this information.

- Delayed replacement surveys - when surveys were reported lost or misplaced as a reason for not responding to the survey, extra time and postage was spent to resend the survey.

- Delayed receipt of the survey – because of surveys not being delivered to the correct contact or location, extra time and postage were required to resend the survey.

It also should be kept in mind that natural disasters or other forces beyond the control of the surveyor could influence the return rate of the survey. Fortunately this survey was completed one working day before the devastation of Hurricane Katrina. All types of care at the involved hospitals will be affected due to the aftermath of this deadly storm.

Partners

Partners in the effort to reduce mortality and morbidity related to stroke include, but are not limited to, the American Heart/Stroke Association, the University of Mississippi Medical Center, the Mississippi Nurses Association and the Mississippi Hospital Association. In addition to these organizations, there is an existing Mississippi Heart Disease and Stroke State Plan 2004-2013. This plan was developed by representatives from the Mississippi Department of Health, the Mississippi Chronic Illness Coalition-CVD Advisory Committee, and the Mississippi Task Force on Heart Disease and Stroke Prevention. It is expected that all of the above existing Mississippi organizations are interested in collaborating to improve the care and treatment of patients with acute stroke.