

Missouri's Acute Stroke System Development 2005



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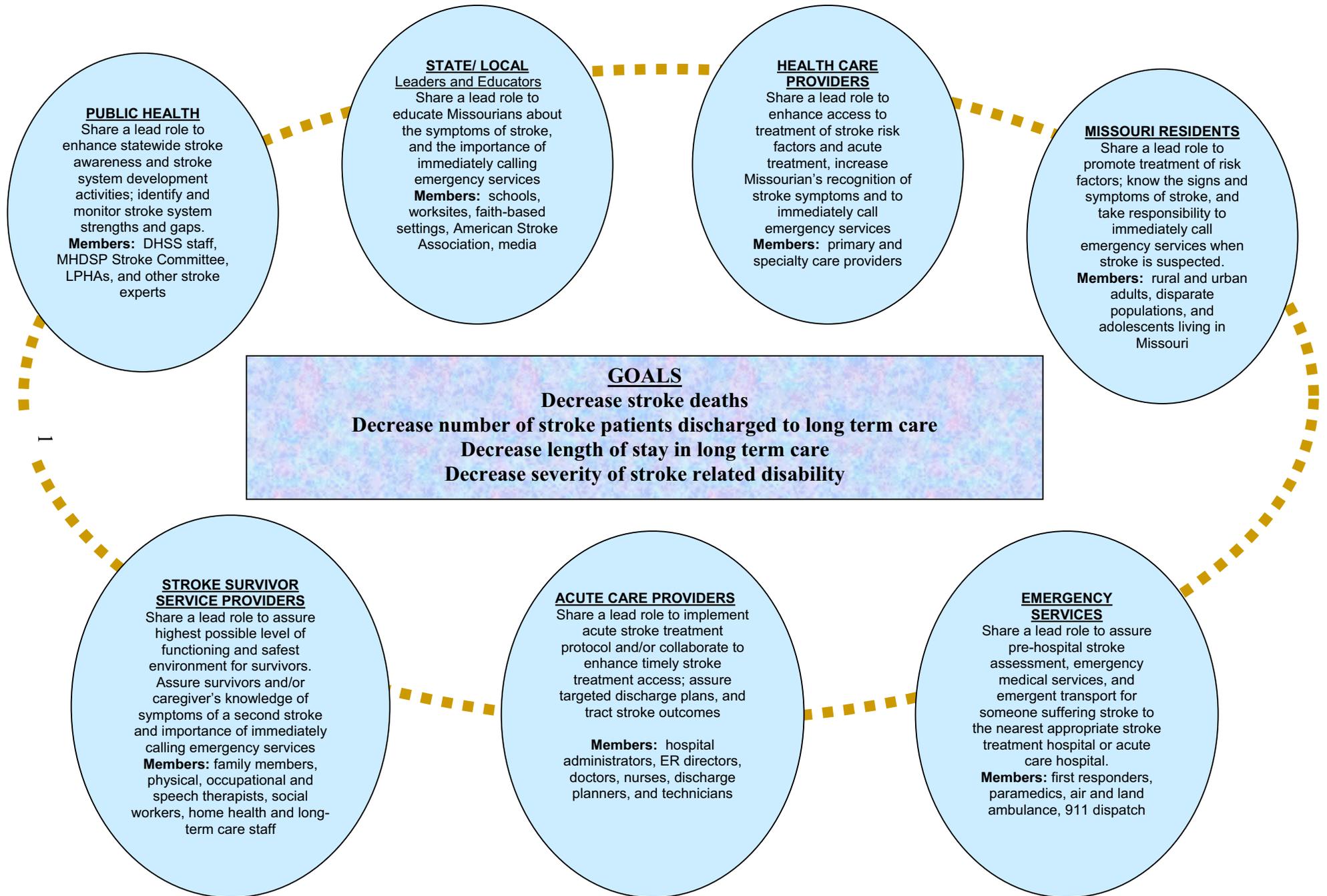
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Missouri's Stroke System Development



Missouri's Acute Stroke System

Each year, stroke accounts for more than 3,500 deaths in Missouri making stroke the third leading cause of death in this state. (MICA 2005) As well, stroke is a leading cause of adult disability. (National Stroke Association, Complete Guide to Stroke 2003)

The goal of this summary is to provide Missouri citizens and Missouri stroke system members with useful information about acute stroke system infrastructure and to provide a tool that can be used to assist future acute stroke system development planning.

What is Stroke?

A stroke, sometimes called a “brain attack,” occurs when blood flow to the brain is interrupted. While a stroke is occurring, it is referred to as the acute phase of a stroke. Brain cells in the immediate area begin to die because they stop getting the oxygen and nutrients they need to function.

As brain cells die, abilities controlled by that area of the brain are impaired. The impact from a stroke ranges from mild to severe, and can include paralysis and impairment of functions such as speech, movement, and memory. Specific abilities lost or affected depend on the location of the stroke in the brain and the amount of damage the stroke caused. (National Stroke Association, Complete Guide to Stroke, 2003)

There are two major kinds of stroke. The first, known as an ischemic stroke, is caused by a blood clot that blocks a blood vessel to the brain. Approximately 84% of strokes are ischemic. The second, known as a hemorrhagic stroke, is caused by a blood vessel in the brain that breaks or ruptures spilling blood into the brain. (National Stroke Association, Complete Guide to Stroke, 2003)

Acute Stroke System

“System” is defined as a group of interacting, interrelated, or interdependent members forming a complex whole. (American Heritage College Dictionary 1997) Overall, Missouri's stroke system members interact and interrelate to prevent Missourians from suffering their first stroke; to provide access to emergency care, to provide acute stroke treatment; to provide quality inpatient care; to manage stroke rehabilitation; and to prevent a second or repeat stroke.

Certain members of Missouri's stroke system focus primarily on the *acute phase* of stroke and secondary prevention for stroke survivors. Those members include primary care providers, specialty care providers such as neurologists, emergency medical services, hospital emergency medical staff, the hospital Stroke Team and other hospital staff. For stroke survivors, the system expands to include hospital discharge planners, rehabilitation, caregivers, and providers of services designed for secondary prevention.

This summary report discusses the stroke system in Missouri as it relates to acute stroke and secondary prevention for stroke survivors. These members interact and interrelate to coordinate rapid access to appropriate treatment for acute stroke patients and to coordinate the stroke survivors' discharge through a planned coordinated continuum of follow-up care.

Acute Stroke Treatment

During the past several years, acute stroke *treatment* has experienced significant advances. These advances place new emphasis on Missouri's statewide rapid access into an interacting and interrelated acute stroke system. In 1996, the FDA approved tissue plasminogen activator (tPA) for acute stroke therapy. TPA is an enzyme found naturally in the body that converts or activates plasminogen into another enzyme to dissolve a blood clot. The results of a five-year trial by the National Institutes of Neurological Disorders and Stroke (NINDS) found that carefully selected patients who received tPA within three hours of the beginning of stroke symptoms were at least 33 percent more likely than patients given a placebo to recover from stroke with little or no disability after three months. Although in some cases tPA may cause brain hemorrhage, studies show that tPA does not increase the death rate when compared with placebo. (National Stroke Association, Stroke Rapid Response, 2005)

The first trigger for Missouri's acute stroke system members may be when a resident contacts emergency medical services because they suspect someone may be experiencing one of the signs of stroke. When seeking access to acute stroke treatment, every minute counts. The opportunity to offer stroke treatment is time sensitive and time lost is brain lost. The target is to provide acute stroke treatment access within 3 hours of symptom onset.

2005 Hospital Survey: Missouri's Acute Stroke Treatment System

In 2005, the Missouri Department of Health and Senior Services' (DHSS), Missouri Heart Disease and Stroke Prevention Program (MHDSP) conducted a statewide hospital survey of Missouri's acute stroke treatment system. Survey data provided the first statewide snapshot of the acute stroke treatment system in Missouri as of the survey's end date, July 30, 2005.

MHDSP staff created the survey with input from a statewide MHDSP Stroke Committee. Survey questions were based on Brain Attack Coalition focus points for an acute stroke treatment program. For more information about the Brain Attack Coalition, visit their website at www.stroke-site.org.

The hospital survey data provides Missouri citizens and Missouri stroke system members with useful information and compiles a tool to identify current system strengths and potential opportunities for next steps in system development. However, there are certain limitations to data and information obtained through the survey. All data was self-reported. MHDSP staff verified hospitals reporting to be Primary Stroke Centers have been inspected and certified by the Joint Commission on Accreditation of Health Organizations (JCAHO).

Missouri's Acute Stroke System Strengths

Based on the 2005 hospital survey results, it is apparent that a number of Missouri's hospitals have already begun efforts to organize, develop and enhance Missouri's acute stroke system. One example is that 77 Missouri hospitals self-identify that they currently offer IV tPA for acute stroke treatment. Another example is that, currently, Missouri has six certified Primary Stroke Centers.

JCAHO Certified Primary Stroke Centers

Joint Commission on Accreditation of Healthcare Organizations (JCAHO) began their disease specific certification process in 2004. Because the certification is fairly new, in the United States there are only fourteen states that have as many or more JCAHO certified Primary Stroke Centers than Missouri. Those states are California, Florida, Georgia, Illinois, Michigan, Minnesota, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Texas, Virginia, and Wisconsin.

Through JCAHO's Disease-Specific Care Certification Program, the voluntary certification allows hospitals to become recognized in communities (by EMS, healthcare providers, and consumers) as a certified Primary Stroke Center. The American Stroke Association collaborated with JCAHO to develop the criteria for the program. Certification is one way for hospitals to demonstrate improvements in quality of care as well as provide a way to differentiate their offerings in a competitive environment. These hospitals receive an on-site primary stroke center evaluation by JCAHO once every two years. (American Stroke Association, Acute Stroke Treatment Program Assessment Tool for Stroke Center Directors and Acute Stroke Teams 2004)

The Certificate of Distinction for Primary Stroke Centers recognizes centers that have made exceptional efforts to foster better outcomes for stroke care. It is the best signal to a community that the quality of care provided is effectively managed to meet the unique and specialized needs of stroke patients. (JCAHO website 2005, www.jcaho.org)

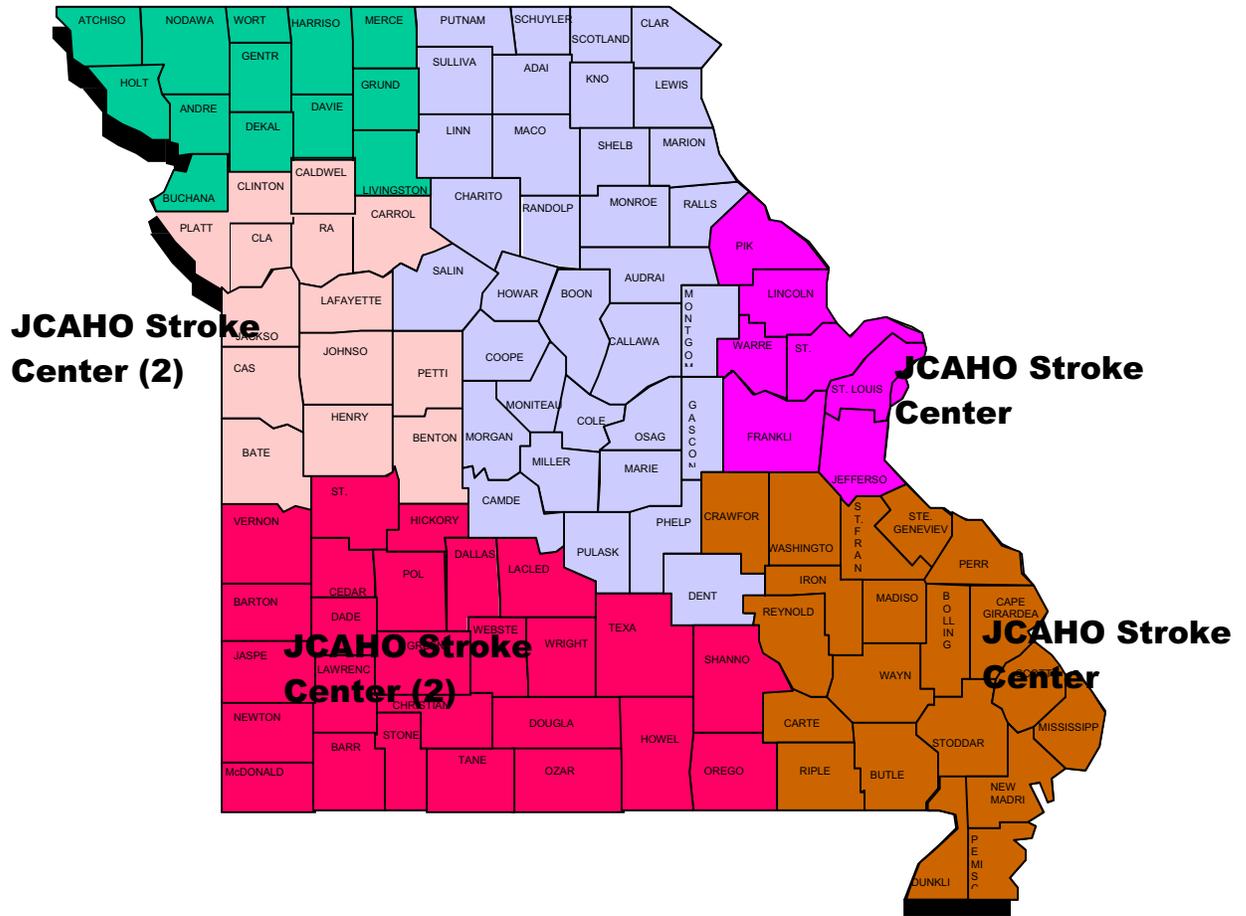
Currently, four main population centers in Missouri are served by a total of six hospitals that voluntarily elected to have their acute stroke infrastructure inspected and have successfully attained certification as a Primary Stroke Center. Missouri's Primary Stroke Centers are:

- **Springfield.....Lester E. Cox Medical Center, 1423 N. Jefferson Avenue**
- **Springfield.....St John's Regional Health Center, 1235 E. Cherokee**
- **Kansas City.....St. Luke's Hospital of Kansas City, 4401 Wornall Road**
- **Kansas City.....Research Medical Center, 2316 E. Meyer**
- **St. Louis.....Barnes-Jewish Hospital, 216 South Kings Highway**
- **Cape Girardeau.....Saint Francis Medical Center, 211 Saint Francis Drive**

**Location of Missouri hospitals currently certified as
JCAHO Primary Stroke Centers**

January 2006

Note: Map is color coded to indicate Missouri Emergency Services Association Regions



Kansas City & surrounding region: Saint Luke’s Hospital, and Research Medical Center, Kansas City

Springfield & surrounding region: Lester E. Cox Medical Center, and St. Johns Regional, Springfield

Cape Girardeau & surrounding region: Saint Francis Medical Center, Cape Girardeau

St. Louis & surrounding region: Barnes-Jewish Hospital, St. Louis

Primary Stroke Centers in Bordering States

The closest bordering Primary Stroke Center is Nebraska Medical Center in Omaha, Nebraska, approximately 60 miles from a Missouri border. Missourians residing in extreme northeastern Missouri may be closer to the JCAHO certified Primary Stroke Centers in Peoria, IL than to a Missouri Primary Stroke Center. However, it may take more than two hours via land transportation to reach Peoria from a Missouri border. In other areas of the state, Missouri JCAHO certified Primary Stroke Centers appear closer for Missouri residents than the out of state Primary Stroke Centers. The following is a list of JCAHO Certified Primary Stroke Centers in states that border Missouri:

ARKANSAS

- Fort Smith..... Sparks Regional Medical Center, 1311 South I Street

ILLINOIS

- Oak Brook.....Advocate Health Care, 2025 Windsor Drive
- Elk Grove.....Alexian Brothers Medical Center, 800 Biesterfield Road
- Naperville.....Edward Health Services, 801 South Washington
- Maywood.....Loyola University Medical Center, 2160 South 1st
- Peoria.....Methodist Medical Center of Illinois, 221 Northeast Glen Oak
- Peoria.....OFS Saint Francis Medical Center, 530 NE Glen Oak
- Hoffman Estates.....St. Alexions Medical Center, 1555 Barrington Road
- Chicago.....Mercy Hospital/Medical Center, 2525 South Michigan
- Chicago.....University of Illinois Medical Center, 1740 West Taylor
- Chicago.....Northwest Memorial Hospital, 251 East Huron Street

IOWA

- Cedar Rapids.....Mercy Medical Center, 701 10th Street Southeast
- Sioux City..... Mercy Medical Center, 801 5th Street

KANSAS At this time, Kansas does not have a JCAHO certified Primary Stroke Center.

KENTUCKY

- Louisville.....Jewish Hospital, 200 Abraham Flexner-Way
- Lexington.....University of Kentucky Hospital, 800 Rose Street
- Louisville.....University of Louisville Hospital, 530 South Jackson

NEBRASKA

- Omaha.....Nebraska Medical Center, 987462 Nebraska Medical Center

OKLAHOMA At this time, Oklahoma does not have a JCAHO certified Primary Stroke Center.

TENNESSEE

- Bristol.....Wellmont Bristol Regional, 1 Medical Park
- Nashville..... Skyline Medical Center, 3441 Dickerson Pike
- Nashville.....Vanderbilt University Hospital, 1211-22nd South

Statewide Stroke Committee

The statewide Stroke Committee is another acute stroke system strength in Missouri. The Stroke Committee is a subcommittee of the Department of Health and Senior Services', Missouri Heart Disease and Stroke Prevention Program Advisory Board. In 2005, the statewide team of experts that serve on the Stroke Committee drafted the following recommendations for acute stroke system development in Missouri:

Stroke Committee Recommendations

October 2005

The Department of Health and Senior Services' (DHSS) Missouri Heart Disease and Stroke Prevention Program (MHDSP) Stroke Committee has developed two workgroups: Stroke Awareness and Stroke System Development. The committee's current recommendations for system development include the following focus:

- 1) Missourians must recognize stroke and know to immediately call 911 or your local EMS when someone exhibits symptoms. (Stroke Awareness Workgroup)
- 2) Emergency Medical Services (EMS) should receive acute stroke continuing education tied to licensure/certification. EMS must be aware that time is critical because the hospital must complete CT scan and lab before treatment can be offered within three hours of symptom onset. (Both Workgroups)
- 3) Because not all hospitals administer acute stroke treatment, Missouri residents, primary care physicians, and EMS must know the location of the nearest acute stroke treatment hospital. Depending on the distance to that hospital, they must know the closest hospital that is actively cooperating with a stroke treatment hospital. (Both Workgroups)
- 4) In some Missouri regions, there may be long distances to hospitals offering stroke treatment. As regional issues and gaps are identified, system development should encourage a cooperating regional network that focus on regional strengths. Depending on each region's strengths, the system may include ambulance transport, telemedicine, air ambulance, or other methods to assure access to appropriate acute stroke treatment. (System Development Workgroup)

Missouri's Opportunities Acute Stroke System Development

Based on the 2005 hospital survey results and on Stroke Committee recommendations, there is opportunity for Missouri's acute stroke system members to plan and implement their next steps designed to enhance the acute stroke system in Missouri. As the system develops and changes, there will always be additional opportunity to improve. Regions of Missouri are diverse and each has a different set of strengths and weaknesses. The following discussion may not apply to every region of the state, but is offered to system members as potential system development discussion points.

Encourage regional development of stroke system coalitions or task forces

Regionally, system planning may be enhanced through establishing a stroke system task force or coalition. The task force or coalition can become a forum for continued stroke system development discussions and planning. Members could include representatives from stroke treatment hospitals and other area hospitals; emergency medical services; emergency department staff; neurologists; primary care providers; public health; community leaders; stroke survivors or caregivers.

These groups could plan and implement regional education projects designed to increase Missourian's awareness of the signs of stroke, the importance of fast transport, and the locations for acute stroke treatment; and they could plan and implement regional collaboration projects designed to increase the number of Missourians who receive timely access to acute stroke treatment.

Increase the number of Missourians who recognize the signs of stroke

As long as acute stroke treatment remains critically time sensitive, one of the first steps to timely treatment access is to increase Missourian's awareness of the signs of stroke. A number of entities, such as public health organizations and health associations, work to educate Missourians about the signs of stroke. In addition, Missourians should receive that information from their healthcare providers and hospitals.

The 2005 hospital survey identified that only 32.1% of Missouri hospitals offer stroke education opportunities to residents in their region. There is significant room for improvement. Each year, every Missouri hospital should present two or more community education programs designed to educate Missourians about the signs of stroke and what to do when they suspect stroke.

Throughout Missouri, large worksites present an excellent opportunity for hospitals to reach their adult population with valuable stroke awareness education. As well, hospitals may collaborate with Area Agencies on Aging, primary care providers and others to reach more Missourians with information about stroke.

Missourians should recognize that the basic signs of stroke are:

- Sudden numbness or weakness of the face, arm, or leg (especially on one side of the body)
- Sudden confusion, trouble speaking or understanding speech
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, or loss of balance or coordination
- Sudden severe headache with no known cause

Increase the number of Missourians who recognize the signs of stroke and immediately call EMS

In addition to recognizing the signs of stroke, more Missourians must also recognize the need to immediately contact EMS when they suspect someone may be experiencing any one of the signs of stroke.

There are a number of benefits using EMS. One substantial benefit that is not always discussed is that by using EMS for pre-hospital stroke assessment and transport, valuable waiting time is reduced *after* the patient arrives in an emergency department. EMS has the opportunity to conduct pre-hospital stroke assessment, provide emergency pre-hospital care, provide rapid transport, and communicate vital information to the hospital emergency department *before* arrival. That means, before the patient reaches the hospital emergency department door, the emergency room staff receive important information to quickly assemble their Stroke Team and make preparations according to their established acute stroke protocol.

Increase the number of Missourians who know where acute stroke treatment is available

Missourians should be familiar with their region's acute stroke treatment opportunities. The 2005 hospital survey provides one tool. The survey report is not intended to be the sole locator for acute stroke treatment options because systems change and new opportunities develop. Before a stroke emergency happens, Missourians are encouraged to ask questions about acute stroke treatment options in their region. Discussions should include information obtained from their healthcare providers and area hospitals. Missourians should discuss choices with family, and other caregivers.

Increase the number of Missouri counties offering "911"

In most Missouri counties, "911" is the landline telephone number to contact emergency services. Currently, eighty-nine Missouri counties have "911"; five counties are in planning or implementing "911"; and twenty counties are not actively planning "911". For the most current map and information visit www.911.oa.mo.gov.

The opportunity exists to encourage all counties in the state to adopt "911" for emergency services; and to dispatch or coordinate dispatch of medical emergency services through "911". Until all counties use "911" and coordinate all types of emergencies through the "911" number, Missourians should be aware that the emergency telephone number may be different depending on where they are located in our state.

Increase the number of EMS acute stroke system development collaborations

EMS has a critical role in the acute stroke system. They offer pre-hospital assessment of suspected stroke, pre-hospital emergent services, provide valuable information to the hospital emergency room before arrival, and reduce transport time to the nearest appropriate hospital.

There are several acute stroke resources that have products designed for EMS use: American Stroke Association produces a pre-hospital stroke scale; National Institute of Health (NIH) produces the widely recognized NIH stroke scale; and the National Stroke Association offers an EMS training product called "Stroke Rapid Response."

When applicable, EMS stroke system development discussions may include:

- Assurance that certified and licensed EMS staff have and know their acute stroke protocols; receive periodic pre-hospital stroke scale training to identify suspected stroke; note and report time of symptom onset before arrival at the hospital; and triage suspected stroke as emergent and to the nearest appropriate hospital;
- Assurance that local EMS dispatch protocols include a stroke algorithm and assure high priority dispatch for suspected stroke;
- Assurance that local destination protocol targets arrival at the nearest appropriate hospital targeting patient's timely access to acute stroke treatment (target within 3 hours of symptom onset). Related topics may include:
 - Destination protocols for arrival at the nearest appropriate facility: Certified Primary Stroke Center; or other hospital offering acute stroke treatment; or hospital actively networking with a hospital that offers acute stroke treatment (possibly for diagnosis and transfer); or hospital offering emergency care for patients who can not arrive within 2 hours of symptom onset;
 - Protocol for networking with other EMS to assure arrival at the nearest appropriate hospital. (Example: Air ambulance may present one opportunity to increase the number of Missourians who reach the nearest appropriate hospital within an estimated two hours of symptom onset)
 - Protocol assuring that, ASAP while in-route, EMS will relay time saving information (such as suspected diagnosis and time of symptom on-set) to the hospital. This will save critical time by allowing the hospital's Stroke Team to assemble before the patient arrives.

Increase the number of Missouri hospital acute stroke system collaborations

It is recognized that not every hospital offers acute stroke treatment, not only in Missouri but nationwide. The statement is not made to discredit any hospital. There are reasons some hospitals may not administer acute stroke treatment. For example, some hospitals may not have access to around-the-clock infrastructure (staff and/or equipment) for testing and acute stroke diagnosis and treatment; some hospitals may specialize in a particular arena such as psychiatric care or rehabilitation; some hospitals may specialize in rural emergency care and use emergent triage/transfer for specialized acute needs. There is opportunity for collaboration and networking to link some of these hospitals with hospitals that offer acute stroke treatment.

The 2005 hospital survey indicates a number of hospitals do not have designated Stroke Teams or do not have written acute stroke protocols. Even in a competitive environment, there are opportunities to interact and interrelate. Some examples are to explore opportunities for telemedicine, conference calls with specialists, sharing special expertise for in-services, triage and transfer relationships, and more. Each hospital has different strengths that should be taken into consideration. Such as:

- Hospitals that are JCAHO certified Primary Stroke Centers.
- Non-certified hospitals that offer acute stroke treatment, possibly not 24/7.
- Hospitals that don't offer acute stroke treatment, but may offer expedited diagnostic & transfer.
- Hospitals offering 24/7 emergency care for emergency stroke complications, or when symptom onset is past treatment time limits, or when time of symptom onset is unobtainable.

Currently, the target is to administer acute stroke treatment as close to the beginning of symptom onset as possible, and most acute stroke treatment must be provided within three hours of symptom onset. When time of symptom onset is known and emergency room arrival is estimated at within 2 to 3 hours of symptom onset, the appropriate choice may be the nearest hospital providing acute stroke treatment. When time of symptom onset is not obtainable, or when symptoms began more than 3 hours ago, it may be appropriate to reach the nearest hospital offering 24/7 emergency care for stroke complications.

Missouri's JCAHO certified Primary Stroke Centers are valuable destinations for acute stroke treatment. They can be valuable links and partners for hospitals that do not provide acute stroke treatment. They can offer valuable information to hospitals that are developing acute stroke treatment protocols. They offer Missourians access to acute stroke treatment twenty-four hours a day and seven days a week. The Department of Health and Senior Services, the Missouri Heart Disease and Stroke Prevention Program, and the statewide Stroke Committee encourage strategically located hospitals to become JCAHO certified as Primary Stroke Centers.

Increase the number of hospitals with acute stroke protocols

Only 62.5% of Missouri's hospitals report they have emergency department protocols (standing orders) for acute stroke diagnosis/treatment. At this time, it is not anticipated that all Missouri hospitals will develop protocols to provide acute stroke treatment. However, when a hospital does not provide acute stroke treatment, written protocol could take advantage of linkages or collaborations with hospitals that do provide such treatment. Protocol development could include discussions about triage/transfer with diagnostic results submitted by telemedicine; possible use of a regional traveling Stroke Team or certain Stroke Team members available through telemedicine; tPA drip and transport to a Primary Stroke Center.

Reduce the number of Missourians who experience a second or repeat stroke

Nearly one in five transient ischemic attack (TIA) and stroke patients are at risk of suffering a repeat stroke. Missouri hospitals have a unique opportunity to focus on stroke survivors and their families or future caregivers. Hospitals should continue to improve their ability to take advantage of this opportunity by providing information about preventing a second or repeat stroke while the stroke survivor is an in-patient and during discharge planning.

Hospitals have, or should develop, quality assurance infrastructure assuring that discharge service include coordination and provider referrals for the stroke survivor's risk factors such as high blood pressure and cholesterol. As needed, education and referrals should include smoking cessation, exercise programs, nutrition counseling, body-weight management, and other risk factors. To assist hospital staff, there are hospital quality improvement systems such as the American Stroke Association's "Get With the Guidelines-Stroke" designed to improve acute stroke treatment and trigger reminders that may prevent future strokes.

Produce periodic updates on acute stroke system development

In order to monitor acute stroke system progress in Missouri and to assist plans for future system development, new or updated stroke system information should be collected and made available. A baseline survey of the hospital acute stroke treatment system was completed in 2005. Because systems change with time, periodic updates will identify new system strengths and/or identify additional system gaps. Depending on Missouri's system development trends, it may be useful to consider collecting and distributing EMS or rehabilitation baseline data that relates to stroke.

Conclusion

System development, enhancement, and change won't happen overnight. Opportunities to improve will always exist. Although the healthcare environment remains competitive, Missouri acute stroke system members share altruistic goals for patient care. Open communication and collaboration are useful keys to system development within regions of the state. Data indicated that hospitals and stroke system members in Missouri have begun to interact and collaborate or link services in an effort to maximize access to acute stroke treatment. There is reason to believe the trends in acute stroke system development will continue to improve.



(May be reproduced and used as a handout during stroke education activities.)

STROKE

Missouri's Third Leading Cause of Death



Do you suspect someone may be experiencing a **STROKE**?

Pre-hospital stroke indicators:

1) Ask the person to smile.

(Does the person understand and move both sides of their face evenly and with equal ease?)

2) Ask the person to close their eyes and raise both arms.

(Does the person understand and move both arms to the same level with ease?)

3) Ask the person to repeat a simple sentence.

(Does the person understand and is their speech understandable?)

Difficulty with any of these tasks may indicate stroke.

Dial “911” Immediately

Note: “911” does not dial Emergency Services in every Missouri county. When “911” is not available, consult the telephone book for emergency services.

There are other reasons a person may have difficulty with these tasks.

Only a qualified health care provider can diagnose stroke.

By reaching the hospital in time, acute stroke treatment may be an option.

RESOURCES

American Stroke Association www.americanheart.org/presenter.jhtml?identifier=3004586
Washington University School of Medicine www.strokecenter.org/prof/guidelines.htm
Brain Attack Coalition www.stroke-site.org
American Stroke Association www.StrokeAssociation.org 1-8888-4-STROKE
Joint Commission on Accreditation of Health Organizations www.jcaho.org 630-792-5000
National Stroke Association www.stroke.org 1-800-STROKES
National Institute of Neurological Disorders and Stroke www.ninds.nih.gov 1-800-352-9424
Washington University in St. Louis www.strokecenter.org

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