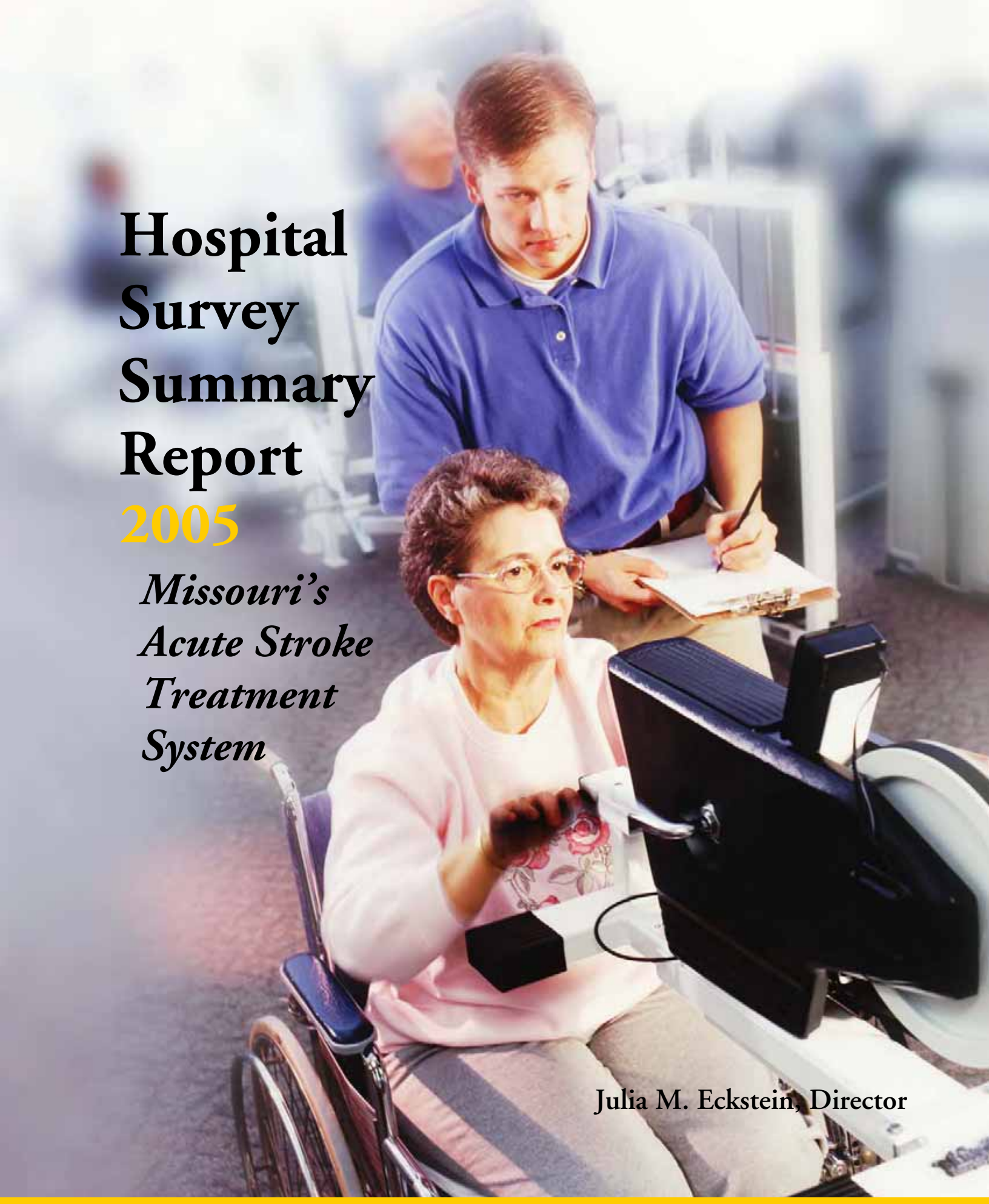

Hospital Survey Summary Report 2005

Missouri's Acute Stroke Treatment System

Julia M. Eckstein, Director

Missouri Department of Health and Senior Services

Hospital Survey Summary Report 2005

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CONTENTS

INTRODUCTION

This summary report presents findings from a Missouri Heart Disease and Stroke Prevention Program (MHDSP) survey on the acute stroke treatment capabilities at Missouri hospitals. Stroke is the third leading cause of death in Missouri, killing 3,483 Missourians in 2004. (MICA 2006) The MHDSP, along with the statewide MHDSP stroke subcommittee, wanted to assess the acute stroke treatment capacity throughout Missouri. This report presents such findings for Missouri.

It is the goal of the MHDSP that all Missourians will benefit from the data presented in this report. Members of the stroke system of care, including the Emergency Medical Service (EMS), hospital emergency medical staff, primary care physicians and neurologists, will be able to identify hospitals throughout Missouri that are equipped to provide rapid, appropriate treatment to acute stroke patients. All parties involved with Missouri hospitals will see where their strengths and limitations lie, where they can improve, and how they compare with hospitals of similar size across the state. Missouri citizens can use this report to learn about the hospital policies, resources and practices needed to provide quality acute stroke treatment services and to educate themselves, as well as their friends and relatives, about the location of hospitals in their area that provide acute stroke care.

METHODOLOGY

The Missouri Department of Health and Senior Services MHDSP conducted a statewide hospital survey of Missouri's acute stroke treatment system. The survey was developed by MHDSP staff, and approved by the MHDSP statewide stroke subcommittee. Questions in the hospital survey were adapted from the Brain Attack Coalition focus points for acute stroke treatment. For more information about the Brain Attack Coalition, visit their website at www.stroke-site.org.

The survey was administered to all Missouri hospitals identified by the Department's Bureau of Health Informatics. In May 2005 a letter was sent to the hospital administrator and emergency department manager at each hospital. Hospitals were given the option to submit their responses on-line, via a web-based survey, or to return the completed survey to the MHDSP via fax or postal mail, by the end of the July 2005. Not all hospitals met the deadline, prompting the MHDSP to allow hospitals additional time to submit their completed surveys. Data collection was considered complete at the end of September 2005.

Each responding hospital could choose to have their information kept confidential. For those hospitals that chose to not be identified, their data are included in the aggregate data, with the results displayed in Figures 1-12. However, those hospitals that chose not to be identified are not listed in Tables 1-12 or Maps 1-5. Appendix A contains a copy of the hospital survey.

RESULTS

One hundred thirty-seven (137) hospitals received the acute stroke system hospital survey. Upon receipt of the survey, 17 hospitals requested that their facility be excluded from this survey, because the topics covered in the survey were not applicable to the services their facility provides. Among those excluded were facilities that specialize in psychiatric care, rehabilitation, or acute care for children. Of the 120 remaining hospitals, 112 completed the survey, a 93.3% response rate. Sixteen

(14.3%) of the responding hospitals chose to not be identified. As previously described, their data are included in the aggregate analysis, but the hospitals are not identified in the tables or maps. One hospital submitted a survey, but did not identify the submitting hospital. The data from that hospital are not included.

An overall summary of the survey results for the 112 responding Missouri hospitals follows.

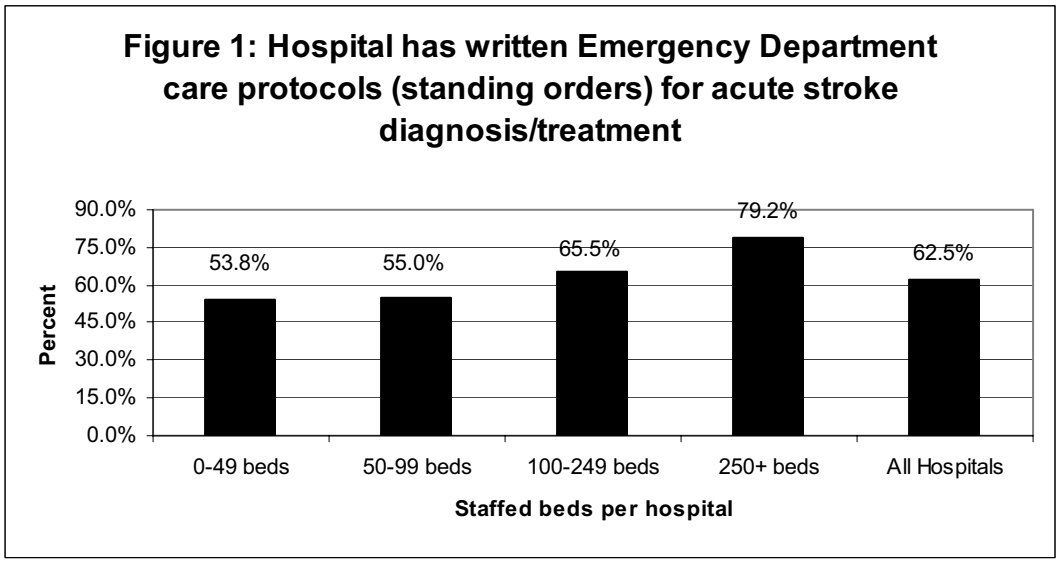
Summary Results of the 2005 Hospital Survey: Missouri's Acute Stroke Treatment System (N = 112)	
Survey Question	Percent "Yes" (n)
1. Does the hospital have written Emergency Department care protocols (standing orders) for acute stroke diagnosis/treatment?	62.5% (70)
2. Does the Emergency Department staff receive training in the care protocols for acute stroke diagnosis/treatment?	61.6% (69)
3. Does the hospital have a designated Stroke Team Available 24/7?	17.0% (19)
4. Does the hospital have CT scan and CT technician available 24/7?	92.0% (103)
5. Can the hospital provide laboratory services 24/7 with expedited results within 45 minutes?	93.8% (105)
6. Does the hospital currently administer IV rtPA for acute stroke treatment?	67.9% (76)
7. Does the hospital have written inpatient protocol for management/care of an acute stroke patient?	41.1% (46)
8. Does the hospital have designated in-patient beds for stroke patients?	14.3% (16)
9. Does the hospital present a minimum of 2 programs per year educating the public on stroke risk factor reduction and signs/symptoms of acute stroke?	32.1% (36)
10. Does the hospital have a database or system to collect data and to track quality improvement activity related to their stroke patients?	28.6% (32)
11. Is the hospital certified by JCAHO as a Primary Stroke Center?	4.5% (5)
12. Does the hospital have a strategic plan for becoming a JCAHO certified Primary Stroke Center?	15.1% (16 of 106)

Results are presented below according to each question asked on the acute stroke system hospital survey. Data are presented by hospital size, measured by the number of staffed beds grouped into four categories: 0-49 staffed beds (39 responding hospitals), 50-99 staffed beds (20 responding hospitals), 100-249 staffed beds (29 responding hospitals), and more than 250 staffed beds (24 responding hospitals).

QUESTION #1

Does the hospital have written Emergency Department care protocols (standing orders) for acute stroke diagnosis/treatment?

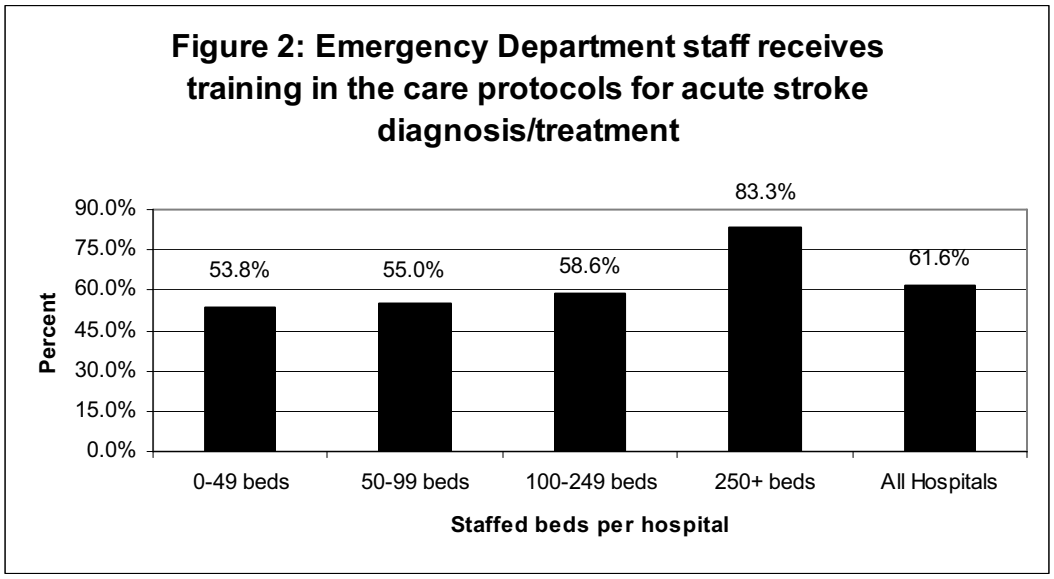
Of the 112 Missouri hospitals that responded to survey question #1, 70 hospitals (62.5%) responded "yes", they have written Emergency Department (ED) care protocols for acute stroke diagnosis/treatment. As seen in Figure 1, almost 80% of the largest hospitals (250+ staffed beds) responded that they had written ED protocols for acute stroke care. Conversely, slightly over half of the smallest hospitals (0-49 staffed beds) had such protocols in place. Table 1 in Appendix B lists those hospitals that have written Emergency Department care protocols for acute stroke diagnosis/treatment, and the city where those hospitals are located.



QUESTION #2

Does the Emergency Department staff receive training in the care protocols for acute stroke diagnosis/treatment?

For survey question #2, 69 of 112 responding Missouri hospitals (61.6%) responded "yes", the ED staff receive training in the care protocols for acute stroke diagnosis/treatment. As with written ED protocols, the largest group of hospitals are most likely to train their staff in the care protocols for acute stroke diagnosis/treatment. (See Figure 2) The response to this question by the next largest group of hospitals (100-249 staffed beds) was similar to that of the smaller size hospitals, with only slightly more than half responding that they provided their ED staff training in the care protocols for acute stroke diagnosis/treatment. Table 2 (Appendix B) lists those hospitals that have ED staff that receive training in the care protocols for acute stroke diagnosis/treatment.

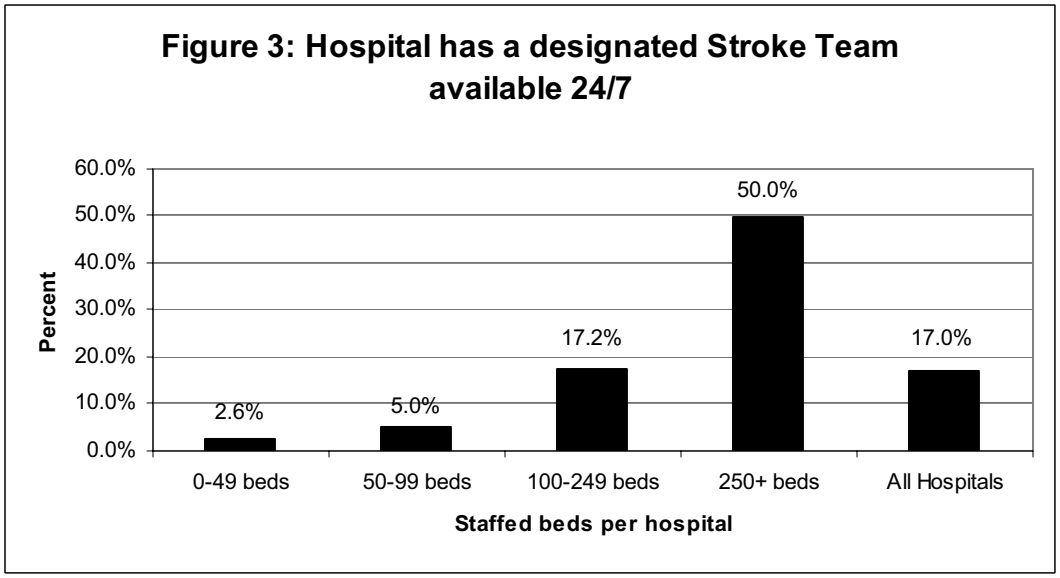


Map 1 (Appendix C) shows the location of Missouri hospitals that responded "yes" to both survey questions 1 AND 2, i.e., hospitals that have written Emergency Department care protocols AND provide the emergency department staff training in the care protocols for acute stroke diagnosis/treatment.

QUESTION #3

Does the hospital have a designated Stroke Team available 24/7?

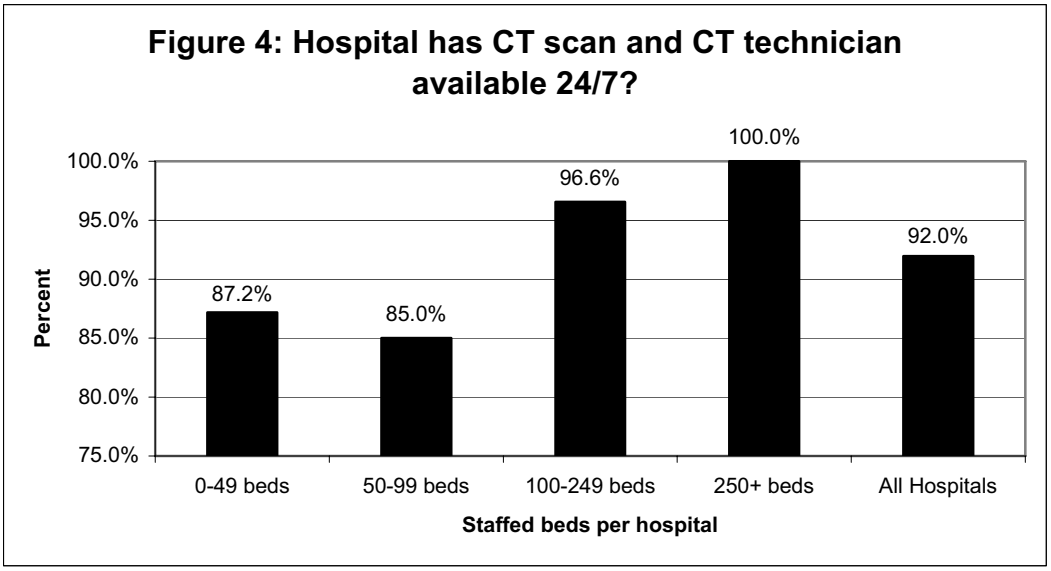
Based on the survey responses, 19 of 112 (17%) Missouri hospitals answered "yes", the hospital does have a designated stroke team that is available all hours. While half of the large hospitals in Missouri stated they have a stroke team, very few of the smaller hospitals have a designated stroke team. (See Figure 3) Table 3 (Appendix B) lists those hospitals that have a designated stroke team available 24 hours per day, seven days per week (24/7), and their location. Map 2 (Appendix C) shows where those hospitals are located in Missouri.



QUESTION #4

Does the hospital have CT scan and CT technician available 24/7?

Of the 112 Missouri hospitals that responded to survey question #4, 103 hospitals (92%) answered "yes", the hospital does have CT scan equipment and one or more technicians available at all hours. As seen in Figure 4 below, the majority of all hospitals, regardless of size, have CT scan capability. All Missouri hospitals with 250 or more staffed beds have CT scan resources. Table 4 (Appendix B) lists those hospitals that have a CT scan and CT technician available 24/7, and their location.

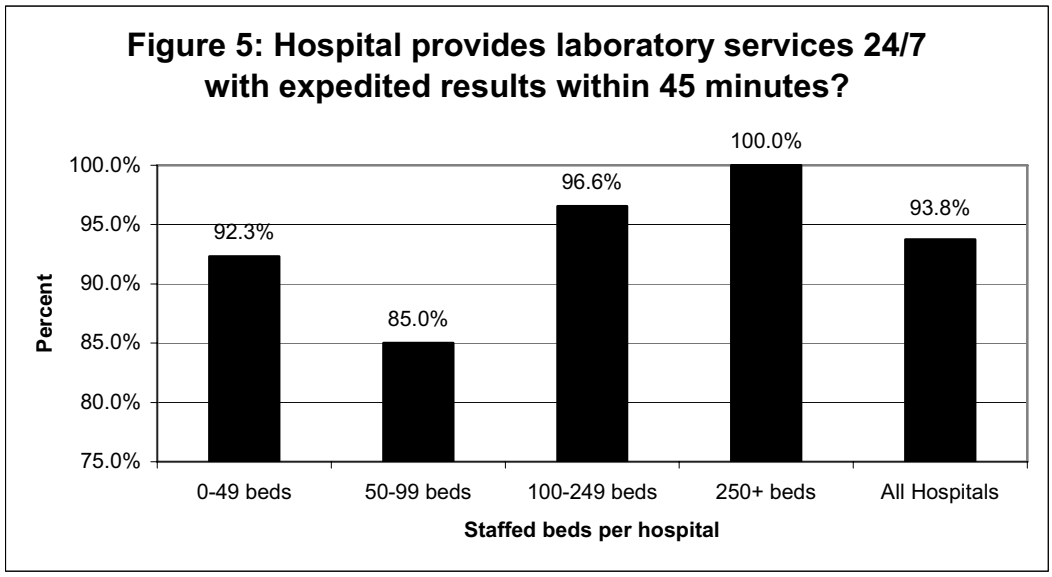


QUESTION #5

Can the hospital provide laboratory services 24/7 with expedited results within 45 minutes?

Almost 94% (105 of 112 responding hospitals) of Missouri hospitals responded "yes", they are able to provide laboratory services at all hours, and can expedite lab results within 45 minutes. Figure 5 on the following page shows that a significant proportion of all Missouri hospitals have laboratory services available at all hours with the ability to expedite results. Table 5 (Appendix B) lists those hospitals that are able to provide 45 minute expedited lab services 24/7, and their location.

Map 3 (Appendix C) shows the location of Missouri hospitals that responded "yes" to both survey questions 4 and 5, i.e. hospitals that have a CT scanner with trained personnel and expedited lab services with results within 45 minutes. Both services are available at all hours.

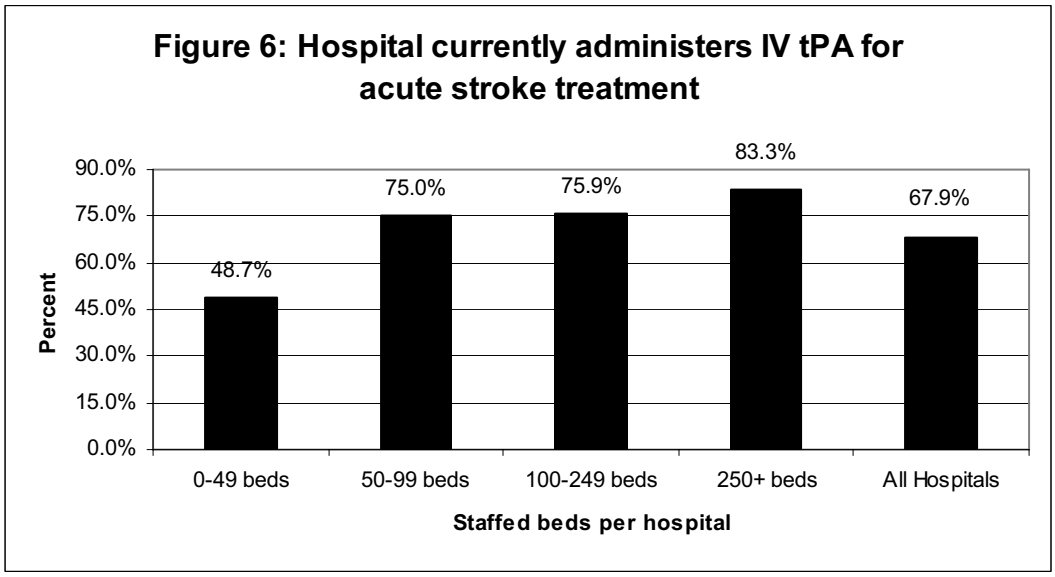


QUESTION #6

Does the hospital currently administer IV tPA for acute stroke treatment?

Of the 112 Missouri hospitals that completed the survey, 76 hospitals (67.9%) responded "yes", the hospital currently administers Intravenous Tissue Plasminogen Activator (IV tPA) for treatment of acute stroke patients. Figure 6 shows that hospitals with 0-49 staffed beds are much less likely than all other hospitals to administer IV tPA to acute stroke patients. Table 6 (Appendix B) lists those hospitals that administer IV tPA to acute stroke patients, and their location. Map 4 (Appendix C) displays graphically where those hospitals are located in Missouri.

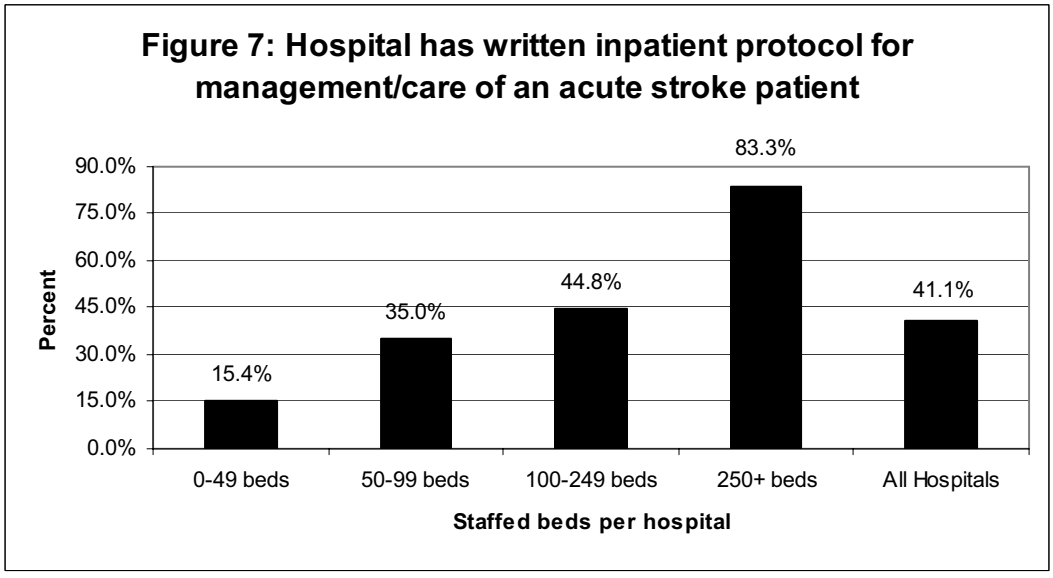
The survey had a follow-up question for those hospitals that stated they administered IV tPA for acute stroke patients: how many times was tPA administered during the previous six months. Forty-six (46) hospitals responded to this question, and based on their results, IV tPA was administered for acute stroke patients 103 times during the six months prior to completing the survey. Ten hospitals reported administering IV tPA five (5) or more times in the six months prior to completing the survey. Of those 10 hospitals, nine have 250 or more staffed beds, with the other hospital having 50-99 staffed beds. Four of the nine hospitals are Joint Commission on Accreditation of Healthcare Organizations (JCAHO) certified Primary Stroke Centers. These four hospitals, Research Medical Center and St. Luke's in Kansas City, and Cox Health and St. John's in Springfield, accounted for 32% (33 of 103) of the total administrations of IV tPA.



QUESTION #7

Does the hospital have written inpatient protocol for management/care of an acute stroke patient?

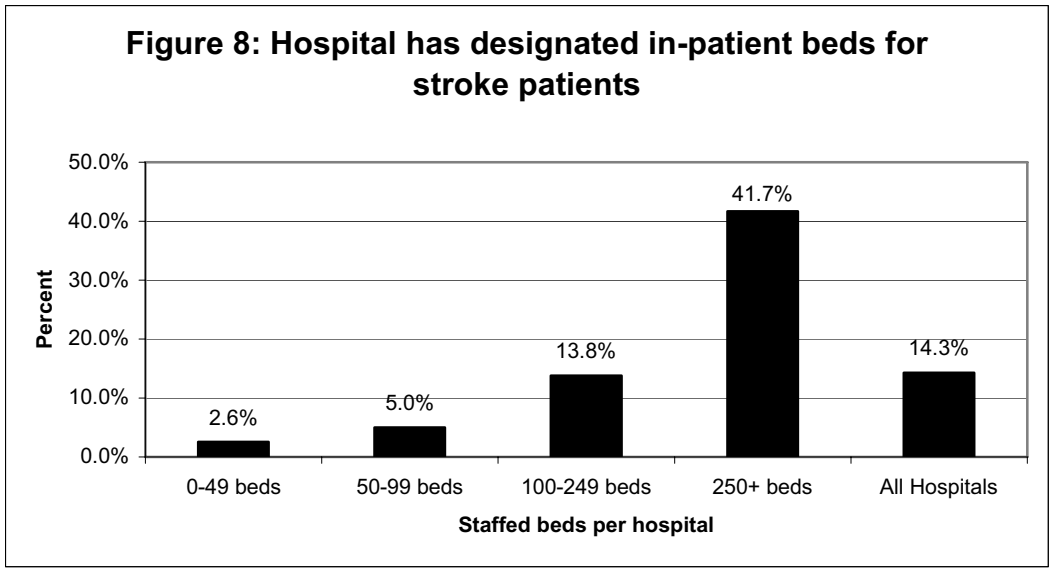
Based on the hospital responses, 46 of 112 Missouri hospitals (41.1%) answered "yes", the hospital has written inpatient protocol for the management or care of an acute stroke patient. As shown in Figure 7, a majority of the largest hospitals in Missouri have written inpatient protocols. That number drops to less than half of the hospitals between 100-249 staffed beds, and finally to only 15.4% of the smallest Missouri hospitals. Table 7 (Appendix B) lists those hospitals that have written inpatient protocol for the management/care of an acute stroke patient, and their location.



QUESTION #8

Does the hospital have designated in-patient beds for stroke patients?

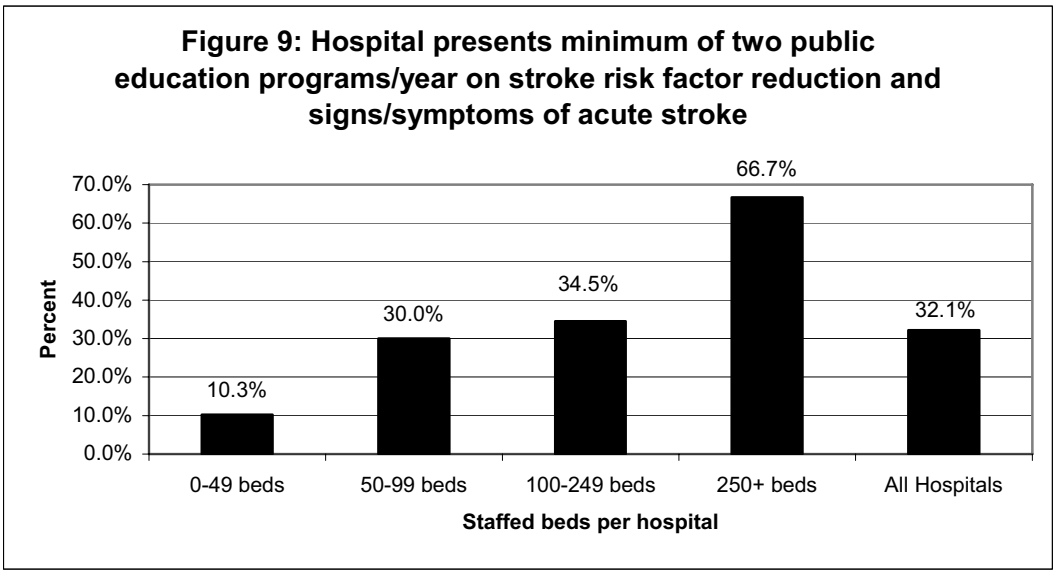
Of the 112 Missouri hospitals that completed survey question #8, 16 hospitals (14.3%) responded "yes", the hospital has designated in-patient beds for stroke patients. Even among the largest hospitals in Missouri, less than half responded that they have designated inpatient beds for stroke patients. The overwhelming majority of hospitals with less than 250 staffed beds do not have beds specifically designated for stroke patients. Table 8 (Appendix B) lists those hospitals that have in-patient beds specifically designated for stroke patients, and their location.



QUESTION #9

Does the hospital present a minimum of two programs per year educating the public on stroke risk factor reduction and signs/symptoms of acute stroke?

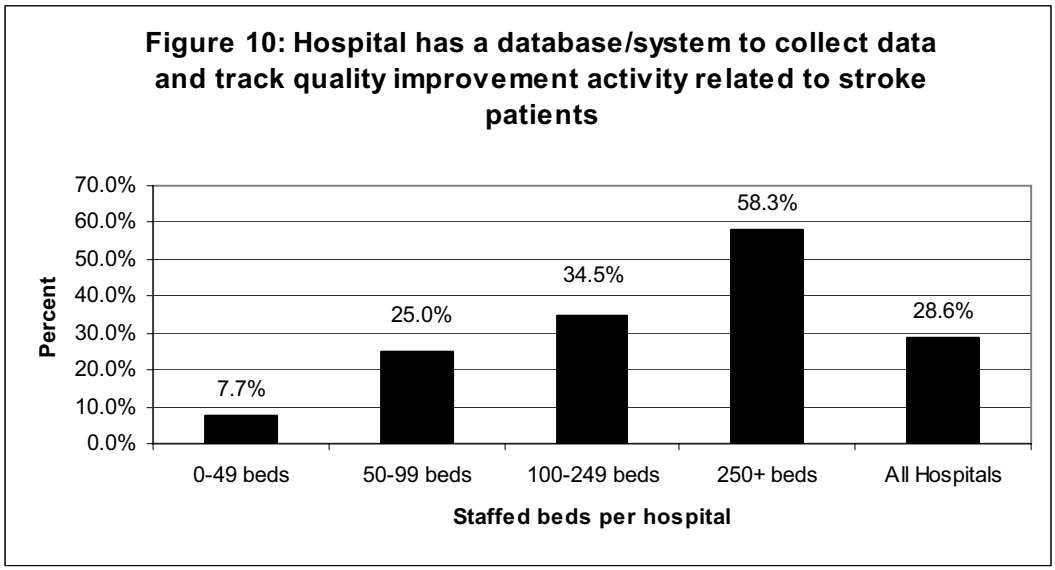
Based on the survey results, 36 of 112 hospitals (32.1%) responded that "yes", they present at least two public education programs per year on stroke risk factor reduction and how to recognize the signs and symptoms of acute stroke. While two-thirds of the largest hospitals answered "yes" to question #9, only about one-third of hospitals with 50-99 and 100-249 staffed beds did so. Only about 10% of the hospitals with less than 50 staffed beds presented at least two educational programs to the general public on stroke risk factor reduction and the signs and symptoms of acute stroke. Table 9 (Appendix B) lists those hospitals that offer a minimum of two public education programs, and their location.



QUESTION #10

Does the hospital have a database or system to collect data and track quality improvement activity related to their stroke patients?

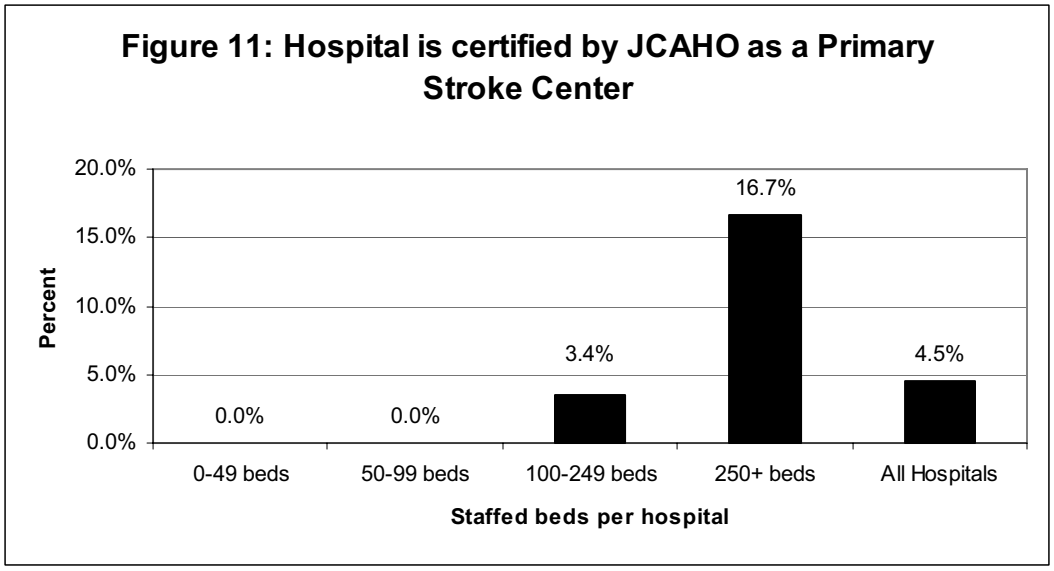
Of the 112 Missouri hospitals that completed survey question #10, 32 hospitals (28.6%) responded "yes", their hospital has a database or other system to collect data and track quality improvement activity related to their stroke patients. Figure 10 shows that only slightly more than half of the largest hospitals have a system in place to track quality improvement activity related to acute stroke care. This percentage decreases as hospital size decreases. Table 10 (Appendix B) lists each hospital and its location.



QUESTION #11

Is the hospital certified by JCAHO as a Primary Stroke Center?

Question #11 asked hospitals if they were a JCAHO certified Primary Stroke Center. Only five (5) of the 112 responding hospitals (4.5%) answered "yes" to question #11. As seen in Figure 11, all of the Primary Stroke Centers are in the larger hospitals, with four in the largest groups of hospitals (250+ staffed beds) and one in the group with 100-249 staffed beds. Table 11 (Appendix B) lists the hospitals and their location. Map 5 (Appendix C) displays the location of the JCAHO certified Primary Stroke Centers in Missouri.

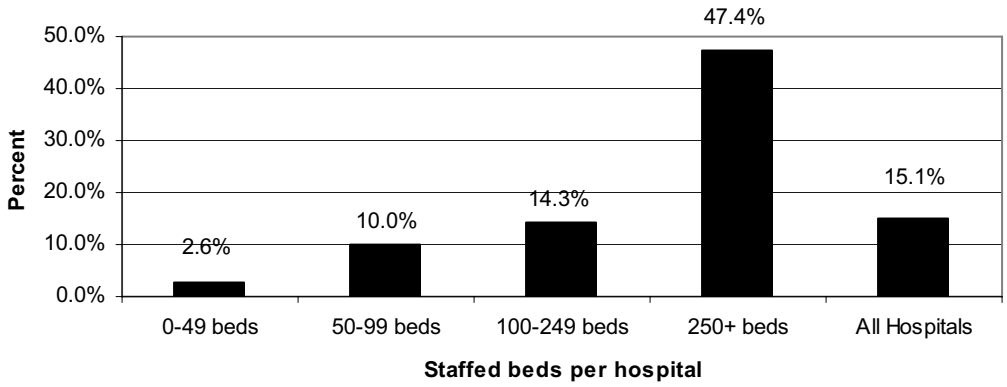


QUESTION #12

Does the hospital have a strategic plan for becoming a JCAHO certified Primary Stroke Center?

Of the 112 Missouri hospitals that completed survey question #12, 16 hospitals (15.1%) responded that "yes", the hospital has a strategic plan for becoming a JCAHO certified Primary Stroke Center. For this question, the denominator was 106. (The five JCAHO certified Primary Stroke Centers were not included, plus one other hospital because of its close affiliation with one of the primary stroke centers.) Figure 12 shows that most of the hospitals with a plan to become a JCAHO certified Primary Stroke Center have 250 or more staffed beds. Table 12 (Appendix B) lists those hospitals that have an existing strategic plan to become a JCAHO certified Primary Stroke Center, and their location.

Figure 12: Missouri hospitals that have a strategic plan for becoming a JCAHO certified Primary Stroke Center



DISCUSSION

The results of the acute stroke survey of Missouri hospitals show that there is much work to be done to develop the best possible system to serve acute stroke patients. Survey results presented above show great variation by individual question, as well as by hospital size, measured by the number of staffed hospital beds.

The largest hospitals (those with 250 or more staffed beds) were more likely to answer "yes" to the questions posed on the acute stroke survey. For all 12 survey questions, the highest percentage of hospitals answering "yes" to each question were those with 250 or more staffed beds. The smallest hospitals, those with less than 50 staffed beds, were least likely to answer "yes" to all survey questions except for questions #4 and 5, related to CT scan capacity and the ability to expedite laboratory results. For these questions, hospitals with 50-99 staffed beds had the fewest "yes" responses. These results reflect that larger hospitals are more likely to have the capacity to treat acute stroke in terms of funding, technology, and/or professional staff.

Though smaller hospitals may not have the capacity to provide all aspects of acute stroke care identified in the survey, smaller hospitals still play a major role in the acute stroke system in Missouri. In many cities and towns throughout Missouri, the first stop for people to receive medical attention is a small hospital. It is vitally important that protocols exist in these smaller hospitals regarding acute stroke to allow acute stroke patients to be transferred to hospitals with the capacity to treat acute stroke.

The results of the acute stroke hospital survey identify many areas for future capacity building. These include:

- Only 62.5% of Missouri's hospitals reported that they have emergency department protocols (standing orders) for acute stroke diagnosis/treatment. (Question #1 of survey)
- Similarly, only 61.6% of Missouri's hospitals reported that emergency department staff receives training in protocols to treat an acute stroke patient. (Question #2 of survey) These two questions taken together demonstrate an important educational opportunity

to improve stroke care. Often the first place in a hospital that sees an acute stroke patient is the emergency department. With proper training on protocols and standing orders regarding acute stroke, a patient can more quickly receive the care needed.

- Only 41.1% of Missouri's hospitals reported that they have inpatient protocols for treating an acute stroke patient. (Question #7 of survey)
- Only 32.1% of Missouri's hospitals reported that they offer at least two public education programs per year on stroke risk factors and the signs and symptoms of acute stroke. (Question #9 of survey)
- Only 28.6% of Missouri's hospitals reported that they have a database or system to collect data and track quality improvement activity related to their stroke patients. (Question #10 on survey)

As hospitals address these issues, acute stroke patient care could improve, leading to improved medical outcomes, including decreased morbidity and mortality.

The results of the hospital survey identify many areas of solid support for acute stroke treatment. Areas of support include:

- Almost all hospitals in Missouri have a CT scanner with trained personnel and expedited lab services with results within 45 minutes, available at all hours. (Questions # 4 and 5 of survey)
- Over 2/3 of Missouri hospitals reported that they administer IV tPA for acute stroke treatment. (Question # 6 of survey)
- Five Missouri hospitals that responded to the survey are certified as JCAHO Primary Stroke Centers. After the survey data were collected, the MHDSP learned that a hospital that did not complete the survey, Barnes-Jewish hospital in St. Louis, was also certified as a JCAHO certified Primary Stroke Center. These six hospitals represent 3.2% of all Primary Certified Stroke Centers in the United States as of January 26, 2006.
- An additional 14.3% of Missouri hospitals reported that they plan to become a JCAHO certified Primary Stroke Center, and have a strategic plan in place to achieve this goal.

The survey results show that all Missourians are within a short distance of a hospital that has CT and lab services and of a hospital that can administer IV tPA. (See Maps 3 and 4 in Appendix B) Including Barnes-Jewish as a certified Primary Stroke Center, four regions of the state are directly served by Primary Stroke Centers (Kansas City, St. Louis, Southeast and Southwest). Those Missourians that are not in these regions can travel by ambulance, or air ambulance if necessary, to receive the specialized stroke treatment offered by Primary Stroke Centers. (See Map 5 in Appendix C) If the hospitals that identified their desire to become Primary Stroke Centers indeed complete their certification, Missourians will have even better treatment and care opportunities available regarding acute stroke.

Not all hospitals have the infrastructure to administer acute stroke treatment. However, all hospitals, Missourians, primary care physicians and EMS should know the location of the nearest acute stroke treatment hospital, and/or the closest hospital that is actively cooperating with a stroke treatment hospital. Such a collaborative approach to acute stroke treatment will increase the potential that acute stroke patients arrive as quickly as possible to a hospital that is able to provide them proper and timely care.

Already, several hospitals in Missouri have begun to link their acute stroke services in an effort to maximize access to treatment. These links are designed to capitalize on regional system strengths.

There are an array of possibilities for collaboration. Some may expedite diagnosis or assist hospitals to develop acute stroke protocols; some may link triage relationships with treating hospitals; and some may negotiate innovative ways to share expertise through in-services, computer technology, telemedicine and conference calls. Those hospitals that will not provide acute stroke treatment could develop protocols (standing orders) that take advantage of linkages and collaborations. These may include, but are not limited to, protocols that address: immediate triage and transfer for diagnosis and treatment; expedited CT scan and lab tests with results sent to a regional Stroke Team specialist using technology; tPA drip; and transport to a Primary Stroke Center.

Project Limitations

There are limitations to the data obtained through this survey. First, all data were self-reported. The only data that were verified are from those hospitals that were inspected and certified by JCAHO as a Primary Stroke Center. Second, two copies of the survey were mailed to all Missouri hospitals. One copy was mailed to the hospital administrator and one to the emergency department director. Thus, responses could be different based on which hospital staff member completed the survey. Third, participation of each individual hospital was voluntary, though the hospital response rate was 93.3%. Once the 60 day deadline for receipt of the acute stroke survey passed, the MHDSP and stroke sub-committee sent a second mailing, telephoned and/or emailed those hospitals that had not responded to the survey requesting they complete the survey.

In question #6 of the survey, hospitals were asked if they administered IV tPA, and if yes, how many times it was administered in the six months prior to completing the survey. It was reported that of all hospitals that completed the survey, IV tPA was administered 90 times. However, it is unknown if this is a large or small number. The survey did not ask how many stroke patients were eligible to receive IV tPA, and therefore cannot determine the percent of time eligible patients receive this treatment.

Given the limitations of the survey, these data are still a valuable tool to help identify strengths and limitations within the acute stroke treatment system in Missouri. The survey data identified specific indicators within the hospital stroke treatment system that will allow hospitals and other stroke caregivers to plan regional and statewide systems to improve the speed and quality of stroke treatment and care.

CONCLUSIONS

The results of this survey are designed to serve a predominantly educational role. For hospitals, the MHDSP hopes that the survey results will inspire change in stroke care that will improve the speed and quality of acute stroke care. Additionally, the MHDSP hopes that hospitals will begin or continue discussions to facilitate stroke systems of care to speed diagnosis and link acute stroke patients with hospitals that can provide timely, appropriate care. For EMS, the MHDSP hopes that the survey results will encourage change in transport protocols so that acute stroke patients arrive at specific hospitals based on their treatment needs. For the general public, the MHDSP hopes that the survey results will prompt citizens to educate themselves on the best hospitals in their immediate area for stroke care needs.

Appendix A

Missouri Department of Health and Senior Services, Heart Disease and Stroke Prevention Program
Hospital Survey: Missouri's Acute Stroke Treatment System

Hospital Name: _____
Hospital Location (City & County): _____
Hospital Fax: _____ Email: _____
Contact Person: _____

Please complete and submit this survey on-line at www.dhss.mo.gov/Stroke/AcuteStroke Survey

Or, mail completed survey to:
Or, fax completed survey to:
(573) 522-2898

Department of Health and Senior Services
Missouri Heart Disease and Stroke Program
Attn: Karen Connell
P.O. Box 570
Jefferson City, MO 65102-0570

☐ By checking this box, the hospital indicates the preference not to be identified as part of the Acute Stroke Treatment System in Missouri and that their survey response only be used in aggregate data reports to identify an overview of the acute stroke treatment system strengths, issues, and gaps.

SURVEY QUESTIONS	YES	NO	Other Information (Please complete when applicable)
1. Does the hospital have written Emergency Department care protocols (standing orders) for acute stroke diagnosis/treatment?			Does Emergency Department protocol include telemedicine? ☐ Yes, currently in protocol ☐ No, but is in future plans
2. Does the Emergency Department staff receive training in the care protocols for acute stroke diagnosis/treatment?			
3. Does the hospital have a designated Stroke Team available 24/7?			☐ Stroke Team available specific hours
4. Does the hospital have CT scan and CT technician available 24/7?			☐ CT scan is available specific hours
5. Can the hospital provide laboratory services 24/7 with expedited results within 45 minutes?			☐ Laboratory services available during business hours
6. Does the hospital currently administer IV rtPA for acute stroke treatment?			If yes, list the number of times rtPA was administered for acute stroke treatment during past 6 months:
7. Does the hospital have written inpatient protocol for management/care of an acute stroke patient?			
8. Does the hospital have designated in-patient beds for stroke patients?			If yes, list number of beds:
9. Does the hospital present a minimum of 2 programs per year educating the public on stroke risk factor reduction and signs/symptoms of acute stroke?			
10. Does the hospital have a database or system to collect data and to track quality improvement activity related to their stroke patients?			Is that system GWTG-Stroke?
11. Is the hospital certified by JCAHO as a Primary Stroke Center?			
12. Does the hospital have a strategic plan for becoming a JCAHO certified Primary Stroke Center?			

Optional:
Survey responders are invited to submit suggestions for enhancing Missouri's acute stroke treatment system on the reverse side of the completed survey, or by attaching additional pages to the completed survey.

APPENDIX B

Table 1: Hospitals that self identify they have written Emergency Department care protocols for acute stroke diagnosis/treatment.

Hospital	City
Baptist-Lutheran Medical Center	Kansas City
Barnes-Jewish St. Peters Hospital	St. Peters
Barton County Memorial Hospital	Lamar
Bates County Memorial Hospital	Butler
Boone Hospital Center	Columbia
Cameron Regional Medical Center	Cameron
Capital Region Medical Center	Jefferson City
Cass Medical Center	Harrisonville
Christian Hospital	St. Louis
Citizens Memorial Hospital	Bolivar
Cox Health	Springfield
Cox Medical Center South	Springfield
Cox Monett Hospital, Inc.	Monett
Des Peres Hospital	St. Louis
Forest Park Hospital	St. Louis
Freeman	Joplin
Freeman Neosho Hospital	Neosho
Golden Valley Memorial Hospital	Clinton
Hannibal Regional Hospital	Hannibal
Heartland Regional Medical Center	St. Joseph
Hedrick Medical Center	Chillicothe
Independence Regional Health Center	Independence
Lee's Summit Hospital	Lee's Summit
Liberty Hospital	Liberty
Lincoln County Medical Center	Troy
Medical Center of Independence	Independence
Missouri Baptist Medical Center	Town and Country
Missouri Southern Healthcare	Dexter
Moberly Regional Medical Center	Moberly
Northwest Medical Center	Albany
Ozarks Medical Center	West Plains
Parkland Health Center-Bonne Terre	Bonne Terre
Pemiscot Memorial	Hayti
Putnam County Memorial Hospital	Unionville
Ray County Memorial Hospital	Richmond
Research Belton Hospital	Belton
Research Medical Center	Kansas City
Reynolds County Memorial Hospital	Ellington
Ripley County Memorial Hospital	Doniphan
SAC Osage Hospital	Osceola
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke’s Hospital of Kansas City	Kansas City
St. Luke's Northland- Barry Road	Kansas City
Scotland County Memorial Hospital	Memphis
Skaggs Community Health Center	Branson
Southeast Missouri Hospital	Cape Girardeau
SSM DePaul Health Center	Bridgeton
SSM St. Joseph Hospital West	St. Louis
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles & Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Anthony's Medical Center	St. Louis
St. Francis Hospital & Health Services	Maryville
St. John's Hospital	Aurora
St. John's Hospital	Lebanon
St. John's Hospital	Springfield
St. John's Mercy Medical Center	St. Louis
St. Luke’s Hospital	Chesterfield
St. Mary's Medical Center	Blue Springs
Sullivan County Memorial Hospital	Milan
Texas County Memorial Hospital	Houston
Wright Memorial Hospital	Trenton

Table 2: Hospitals that self identify the Emergency Department staff receive training in care protocols for acute stroke diagnosis/treatment.

Hospital	City
Baptist-Lutheran Medical Center	Kansas City
Barnes-Jewish St. Peters Hospital	St. Peters
Barton County Memorial Hospital	Lamar
Bates County Memorial Hospital	Butler
Boone Hospital Center	Columbia
Cameron Regional Medical Center	Cameron
Capital Region Medical Center	Jefferson City
Cass Medical Center	Harrisonville
Christian Hospital	St. Louis
Citizens Memorial Hospital	Bolivar
Cox Health	Springfield
Cox Medical Center South	Springfield
Cox Monett Hospital, Inc.	Monett
Des Peres Hospital	St. Louis
Forest Park Hospital	St. Louis
Freeman Neosho Hospital	Neosho
Golden Valley Memorial Hospital	Clinton
Hannibal Regional Hospital	Hannibal
Heartland Regional Medical Center	St. Joseph
Hedrick Medical Center	Chillicothe
Independence Regional Health Center	Independence
Liberty Hospital	Liberty
Lincoln County Medical Center	Troy
Medical Center of Independence	Independence
Missouri Baptist Hospital - Sullivan	Sullivan
Missouri Baptist Medical Center	Town and Country
Missouri Southern Healthcare	Dexter
Moberly Regional Medical Center	Moberly
Ozarks Medical Center	West Plains
Perry County Memorial Hospital	Perryville
Pike County Memorial Hospital	Louisiana
Research Medical Center	Kansas City
Reynolds County Memorial Hospital	Ellington
Ripley County Memorial Hospital	Doniphan
SAC Osage Hospital	Osceola
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke’s Hospital of Kansas City	Kansas City
St. Luke's Northland- Barry Road	Kansas City
Scotland County Memorial Hospital	Memphis
Skaggs Community Health Center	Branson
Southeast Missouri Hospital	Cape Girardeau
SSM DePaul Health Center	Bridgeton
SSM St. Joseph Hospital West	St. Louis
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles & Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Alexious Hospital	St. Louis
St. Anthony's Medical Center	St. Louis
St. Francis Hospital & Health Services	Maryville
St. John's Hospital Aurora	Aurora
St. John's Hospital	Cassville
St. John's Hospital	Lebanon
St. John's Hospital	Springfield
St. John's Mercy Medical Center	St. Louis
St. Luke’s Hospital	Chesterfield
Sullivan County Memorial Hospital	Milan
Texas County Memorial Hospital	Houston
Western Missouri Medical Center	Warrensburg
Wright Memorial Hospital	Trenton

Table 3: Hospitals that self identify they have a designated Stroke Team twenty-four hours a day, seven days a week.

Hospital	City
Boone Hospital Center	Columbia
Capital Region Medical Center	Jefferson City
Cox Health	Springfield
Cox Medical Center South	Springfield
Forest Park Hospital	St. Louis
Missouri Baptist Medical Center	Town and Country
Ozarks Medical Center	West Plains
Research Medical Center	Kansas City
St. Francis Medical Center	Cape Girardeau
St. Louis University Hospital	St. Louis
St. Luke's Hospital of Kansas City	Kansas City
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles & Lake St. Louis
St. Anthony's Medical Center	St. Louis
St. John's Hospital	Springfield
St. John's Mercy Medical Center	St. Louis
St. Luke's Hospital	Chesterfield
Texas County Memorial Hospital	Houston

Table 4: Hospitals that self identify they have CT scan and CT technician available twenty-four hours per day, seven days per week.

Hospital	City
Audrain Medical Center	Mexico
Baptist-Lutheran Medical Center	Kansas City
Barnes-Jewish St Peters Hospital	St. Peters
Barton County Memorial Hospital	Lamar
Bates County Memorial Hospital	Butler
Boone Hospital Center	Columbia
Callaway Community Hospital	Fulton
Cameron Regional Medical Center	Cameron
Capital Region Medical Center	Jefferson City
Carroll County Memorial Hospital	Carrollton
Cass Medical Center	Harrisonville
Cedar Co. Memorial Hospital	El Dorado Springs
Christian Hospital	St. Louis
Citizens Memorial Hospital	Bolivar
Columbia Regional Hospital	Columbia
Community Hospital Association	Fairfax
Cox Health	Springfield
Cox Medical Center South	Springfield
Cox Monett Hospital, Inc.	Monett
Crossroads Regional Medical Center	Wentzville
Des Peres Hospital	St. Louis
Doctors Hospital	Springfield
Ellett Memorial Hospital	Appleton City
Forest Park Hospital	St. Louis
Freeman	Joplin
Freeman Neosho Hospital	Neosho
Golden Valley Memorial Hospital	Clinton
Hannibal Regional Hospital	Hannibal
Harrison County Community Hospital	Bethany
Heartland Regional Medical Center	St. Joseph
Hedrick Medical Center	Chillicothe
Independence Regional Health Center	Independence
Lafayette Regional Health Center	Lexington
Lake Regional Health System	Osage Beach
Lee's Summit Hospital	Lee's Summit
Liberty Hospital	Liberty
Lincoln County Medical Center	Troy
Madison Medical Center	Fredricktown
McCune Brooks Hospital	Carthage
Medical Center of Independence	Independence
Missouri Baptist Hospital – Sullivan	Sullivan
Missouri Baptist Medical Center	Town and Country
Missouri Southern Healthcare	Dexter
Moberly Regional Medical Center	Moberly
Northwest Medical Center	Albany
Ozarks Medical Center	West Plains
Pemiscot Memorial	Hayti
Perry County Memorial Hospital	Perryville
Pershing Memorial Hospital	Brookfield
Pike County Memorial Hospital	Louisiana
Putnam County Memorial Hospital	Unionville
Ray County Memorial Hospital	Richmond
Research Medical Center	Kansas City
Reynolds County Memorial Hospital	Ellington
Ripley County Memorial Hospital	Doniphan
SAC Osage Hospital	Osceola
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke's Hospital of Kansas City	Kansas City
St. Luke's Northland- Barry Road	Kansas City
Samaritan Hospital	Macon
Scotland County Memorial Hospital	Memphis
Skaggs Community Health Center	Branson
Southeast Missouri Hospital	Cape Girardeau
SSM DePaul Health Center	Bridgeton
SSM St. Joseph Hospital West	St. Louis
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles/ Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Alexious Hospital	St. Louis
St. Anthony's Medical Center	St. Louis
St. Francis Hospital & Health Services	Maryville
St. John's Hospital Aurora	Aurora
St. John's Hospital	Cassville
St. John's Hospital	Lebanon
St. John's Hospital	Springfield
St. John's Mercy Medical Center	St. Louis
St. John's Regional Medical Center	Joplin
St. Luke's Hospital	Chesterfield
St. Mary's Health Center	Jefferson City
St. Mary's Medical Center	Blue Springs
Sullivan County Memorial Hospital	Milan
Texas County Memorial Hospital	Houston
Truman Medical Center - Hospital Hill	Kansas City
Twin Rivers Regional Medical Center	Kennett
University of Missouri Health Care	Columbia
Western Missouri Medical Center	Warrensburg
Wright Memorial Hospital	Trenton

Table 5: Hospitals that self-identify they offer laboratory services twenty-four hours per day, seven days per week with expedited results within 45 minutes.

Hospital	City
Audrain Medical Center	Mexico
Baptist-Lutheran Medical Center	Kansas City
Barnes-Jewish St. Peters Hospital	St. Peters
Barton County Memorial Hospital	Lamar
Bates County Memorial Hospital	Butler
Boone Hospital Center	Columbia
Callaway Community Hospital	Fulton
Cameron Regional Medical Center	Cameron
Capital Region Medical Center	Jefferson City
Carroll County Memorial Hospital	Carrollton
Cass Medical Center	Harrisonville
Cedar County Memorial Hospital	El Dorado Springs
Christian Hospital	St. Louis
Citizens Memorial Hospital	Bolivar
Columbia Regional Hospital	Columbia
Community Hospital Association	Fairfax
Cox Health	Springfield
Cox Medical Center South	Springfield
Cox Monett Hospital, Inc.	Monett
Crossroads Regional Medical Center	Wentzville
Des Peres Hospital	St. Louis
Doctors Hospital	Springfield
Ellett Memorial Hospital	Appleton City
Forest Park Hospital	St. Louis
Freeman	Joplin
Freeman Neosho Hospital	Neosho
Golden Valley Memorial Hospital	Clinton
Hannibal Regional Hospital	Hannibal
Harrison County Community Hospital	Bethany
Heartland Regional Medical Center	St. Joseph
Hedrick Medical Center	Chillicothe
Independence Regional Health Center	Independence
Lafayette Regional Health Center	Lexington
Lake Regional Health System	Osage Beach
Lee's Summit Hospital	Lee's Summit
Liberty Hospital	Liberty

Hospital	City
Madison Medical Center	Fredricktown
McCune Brooks Hospital	Carthage
Medical Center of Independence	Independence
Missouri Baptist Hospital – Sullivan	Sullivan
Missouri Baptist Medical Center	Town and Country
Missouri Southern Healthcare	Dexter
Moberly Regional Medical Center	Moberly
Northwest Medical Center	Albany
Ozarks Medical Center	West Plains
Pemiscot Memorial	Hayti
Perry County Memorial Hospital	Perryville
Pershing Memorial Hospital	Brookfield
Pike County Memorial Hospital	Louisiana
Putnam County Memorial Hospital	Unionville
Ray County Memorial Hospital	Richmond
Research Belton Hospital	Belton
Research Medical Center	Kansas City
Reynolds County Memorial Hospital	Ellington
Ripley County Memorial Hospital	Doniphan
SAC Osage Hospital	Osceola
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke's Hospital of Kansas City	Kansas City
St. Luke's Northland-Barry Road	Kansas City
Samaritan Hospital	Macon
Scotland County Memorial Hospital	Memphis
Skaggs Community Health Center	Branson
Southeast Missouri Hospital	Cape Girardeau
SSM DePaul Health Center	Bridgeton
SSM St. Joseph Hospital West	St. Louis
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles/ Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Alexious Hospital	St. Louis

Table 5: Hospitals that self-identify they offer laboratory services twenty-four hours per day, seven days per week with expedited results within 45 minutes.

Hospital	City
St. Anthony's Medical Center	St. Louis
St. Francis Hospital & Health Services	Maryville
St. John's Hospital Aurora	Aurora
St. John's Hospital	Cassville
St. John's Hospital	Lebanon
St. John's Hospital	Springfield
St. John's Mercy Medical Center	St. Louis
St. John's Regional Medical Center	Joplin
St. Luke's Hospital	Chesterfield
St. Mary's Health Center	Jefferson City
St. Mary's Medical Center	Blue Springs
Sullivan County Memorial Hospital	Milan
Texas County Memorial Hospital	Houston
Truman Medical Center – Hospital Hill	Kansas City
Twin Rivers Regional Medical Center	Kennett
University of Missouri Health Care	Columbia
Western Missouri Medical Center	Warrensburg
Wright Memorial Hospital	Trenton

Table 6: Hospitals that self-identify they currently administer IV tPA for acute stroke treatment.

Hospital	City
Baptist-Lutheran Medical Center	Kansas City
Barnes-Jewish St. Peters Hospital	St. Peters
Barton County Memorial Hospital	Lamar
Bates County Memorial Hospital	Butler
Boone Hospital Center	Columbia
Callaway Community Hospital	Fulton
Cameron Regional Medical Center	Cameron
Capital Region Medical Center	Jefferson City
Cass Medical Center	Harrisonville
Cedar County Memorial Hospital	El Dorado Springs
Christian Hospital	St. Louis
Citizens Memorial Hospital	Bolivar
Columbia Regional Hospital	Columbia
Cox Health	Springfield
Cox Medical Center South	Springfield
Cox Monett Hospital, Inc.	Monett
Crossroads Regional Medical Center	Wentzville
Des Peres Hospital	St. Louis
Doctors Hospital	Springfield
Forest Park Hospital	St. Louis
Freeman Neosho Hospital	Neosho
Golden Valley Memorial Hospital	Clinton
Hannibal Regional Hospital	Hannibal
Harrison County Community Hospital	Bethany
Heartland Regional Medical Center	St. Joseph
Hedrick Medical Center	Chillicothe
Lee's Summit Hospital	Lee's Summit
Liberty Hospital	Liberty
Lincoln County Medical Center	Troy
Missouri Baptist Hospital - Sullivan	Sullivan
Missouri Baptist Medical Center	Town and Country
Missouri Southern Healthcare	Dexter
Moberly Regional Medical Center	Moberly
Northwest Medical Center	Albany
Ozarks Medical Center	West Plains
Pemiscot Memorial	Hayti
Perry County Memorial Hospital	Perryville
Pershing Memorial Hospital	Brookfield
Ray County Memorial Hospital	Richmond
Research Medical Center	Kansas City
Reynolds County Memorial Hospital	Ellington
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke's Hospital of Kansas City	Kansas City
St. Luke's Northland- Barry Road	Kansas City
Scotland County Memorial Hospital	Memphis
Skaggs Community Health Center	Branson
Southeast Missouri Hospital	Cape Girardeau
SSM DePaul Health Center	Bridgeton
SSM St. Joseph Hospital West	St. Louis
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles/Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Anthony's Medical Center	St. Louis
St. Francis Hospital & Health Services	Maryville
St. John's Hospital	Cassville
St. John's Hospital	Lebanon
St. John's Hospital	Springfield
St. John's Mercy Medical Center	St. Louis
St. John's Regional Medical Center	Joplin
St. Luke's Hospital	Chesterfield
St. Mary's Health Center	Jefferson City
St. Mary's Medical Center	Blue Springs
Texas County Memorial Hospital	Houston
Truman Medical Center	Kansas City
Twin Rivers Regional Medical Center	Kennett
Western Missouri Medical Center	Warrensburg
Wright Memorial Hospital	Trenton

Table 7: Hospitals that self-identify they have written inpatient protocols for management/care of an acute stroke patient.

Hospital	City
Baptist-Lutheran Medical Center	Kansas City
Boone Hospital Center	Columbia
Capital Region Medical Center	Jefferson City
Cass Medical Center	Harrisonville
Christian Hospital	St. Louis
Cox Health	Springfield
Cox Medical Center South	Springfield
Des Peres Hospital	St. Louis
Forest Park Hospital	St. Louis
Freeman	Joplin
Freeman Neosho Hospital	Neosho
Heartland Regional Medical Center	St. Joseph
Hedrick Medical Center	Chillicothe
Lee's Summit Hospital	Lee's Summit
Liberty Hospital	Liberty
Missouri Baptist Medical Center	Town and Country
Missouri Rehabilitation Center	Mt. Vernon
Moberly Regional Medical Center	Moberly
Northwest Medical Center	Albany
Ozarks Medical Center	West Plains
Research Medical Center	Kansas City
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke’s Hospital of Kansas City	Kansas City
St. Luke's Northland- Barry Road	Kansas City
Scotland County Memorial Hospital	Memphis
Southeast Missouri Hospital	Cape Girardeau
SSM DePaul Health Center	Bridgeton
SSM St. Joseph Hospital West	St. Louis
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles & Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Alexious Hospital	St. Louis
St. Anthony's Medical Center	St. Louis
St. John's Hospital Aurora	Aurora
St. John's Hospital	Springfield
St. John's Mercy Medical Center	St. Louis
St. Mary's Medical Center	Blue Springs
Texas County Memorial Hospital	Houston
University of Missouri Health Care	Columbia

Table 8: Hospitals that self-identify they have designated in-patient beds for stroke patients.

Hospital	City
Boone Hospital Center	Columbia
Christian Hospital	St. Louis
Cox Health	Springfield
Cox Medical Center South	Springfield
Des Peres Hospital	St. Louis
Forest Park Hospital	St. Louis
Research Medical Center	Kansas City
St. Francis Medical Center	Cape Girardeau
St. Louis University Hospital	St. Louis
St. Luke's Hospital of Kansas City	Kansas City
Southeast Missouri Hospital	Cape Girardeau
SSM DePaul Health Center	Bridgeton
St. Anthony's Medical Center	St. Louis
St. John's Hospital	Springfield
Texas County Memorial Hospital	Houston
Wright Memorial Hospital	Trenton

Table 9: Hospitals that self-identify they present a minimum of two (2) programs per year educating the public on stroke risk factor reduction and signs/symptoms of acute stroke.

Hospital	City
Boone Hospital Center	Columbia
Capital Region Medical Center	Jefferson City
Cox Health	Springfield
Cox Medical Center South	Springfield
Crossroads Regional Medical Center	Wentzville
Freeman Neosho Hospital	Neosho
Golden Valley Memorial Hospital	Clinton
Heartland Regional Medical Center	St. Joseph
Lee's Summit Hospital	Lee's Summit
Liberty Hospital	Liberty
Madison Medical Center	Fredricktown
Missouri Baptist Medical Center	Town and Country
Missouri Rehabilitation Center	Mt. Vernon
Moberly Regional Medical Center	Moberly
Ozarks Medical Center	West Plains
Perry County Memorial Hospital	Perryville
Pike County Memorial Hospital	Louisiana
Research Medical Center	Kansas City
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke’s Hospital of Kansas City	Kansas City
St. Luke's Northland- Barry Road	Kansas City
Skaggs Community Health Center	Branson
Southeast Missouri Hospital	Cape Girardeau
St. Joseph Hospital West	St. Charles/Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Anthony's Medical Center	St. Louis
St. John's Hospital Aurora	Aurora
St. John's Hospital	Springfield
St. John's Regional Medical Center	Joplin
St. Luke’s Hospital	Chesterfield
Texas County Memorial Hospital	Houston
Wright Memorial Hospital	Trenton

Table 10: Hospitals that self-identify they have a database or system to collect data and track quality improvement activity related to their stroke patients.

Hospital	City
Baptist-Lutheran Medical Center	Kansas City
Boone Hospital Center	Columbia
Capital Region Medical Center	Jefferson City
Cox Health	Springfield
Cox Medical Center South	Springfield
Independence Regional Health Center	Independence
Lee's Summit Hospital	Lee's Summit
Medical Center of Independence	Independence
Missouri Baptist Medical Center	Town and Country
Missouri Rehabilitation Center	Mt. Vernon
Moberly Regional Medical Center	Moberly
Ozarks Medical Center	West Plains
Perry County Memorial Hospital	Perryville
Research Medical Center	Kansas City
Reynolds County Memorial Hospital	Ellington
St. Francis Medical Center	Cape Girardeau
St. Joseph Medical Center	Kansas City
St. Louis University Hospital	St. Louis
St. Luke's Hospital of Kansas City	Kansas City
Southeast Missouri Hospital	Cape Girardeau
SSM St. Joseph Hospital West	St. Louis
St. Joseph	Kirkwood
St. Joseph Hospital West	St. Charles & Lake St. Louis
St. Anthony's Medical Center	St. Louis
St. John's Hospital	Cassville
St. John's Hospital	Springfield
Texas County Memorial Hospital	Houston
Truman Medical Center	Kansas City

Table 11: Hospitals that self-identified they are certified by JCAHO as a Primary Stroke Center.

Hospital	City
Cox Medical Center South	Springfield
St. Luke's Hospital	Kansas City
St. Francis Medical Center	Cape Girardeau
Research Medical Center	Kansas City
St. John's Hospital	Springfield

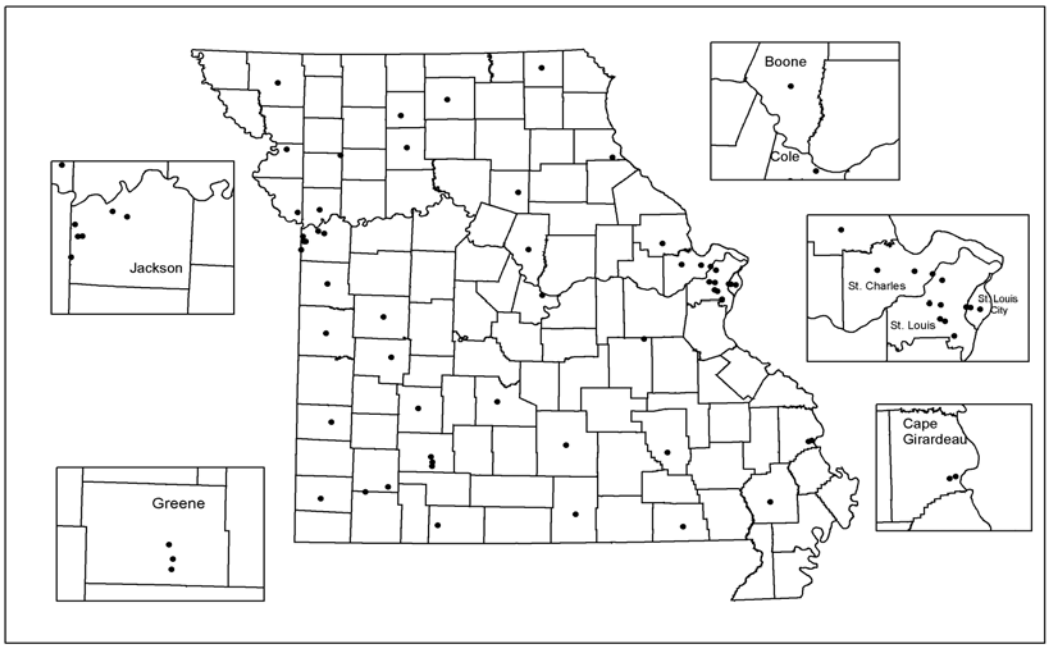
Table 12: Hospitals that self-identify they have a strategic plan for becoming a JCAHO certified Primary Stroke Center.

Hospital	City
Boone Hospital Center	Columbia
Capital Region Medical Center	Jefferson City
Freeman	Joplin
Independence Regional Health Center	Independence
Lee's Summit Hospital	Lee's Summit
Medical Center of Independence	Independence
Missouri Baptist Medical Center	Town and Country
Northeast Regional	Kirksville
Poplar Bluff Regional Medical Center	Poplar Bluff
St. Joseph Medical Center	Kansas City
SSM DePaul Health Center	Bridgeton
SSM St. Joseph Hospital West	St. Louis
St. Joseph Hospital West	St. Charles & Lake St. Louis
SSM St. Mary's Health Center	St. Louis
St. Anthony's Medical Center	St. Louis
St. John's Hospital Aurora	Aurora

APPENDIX C

Map 1

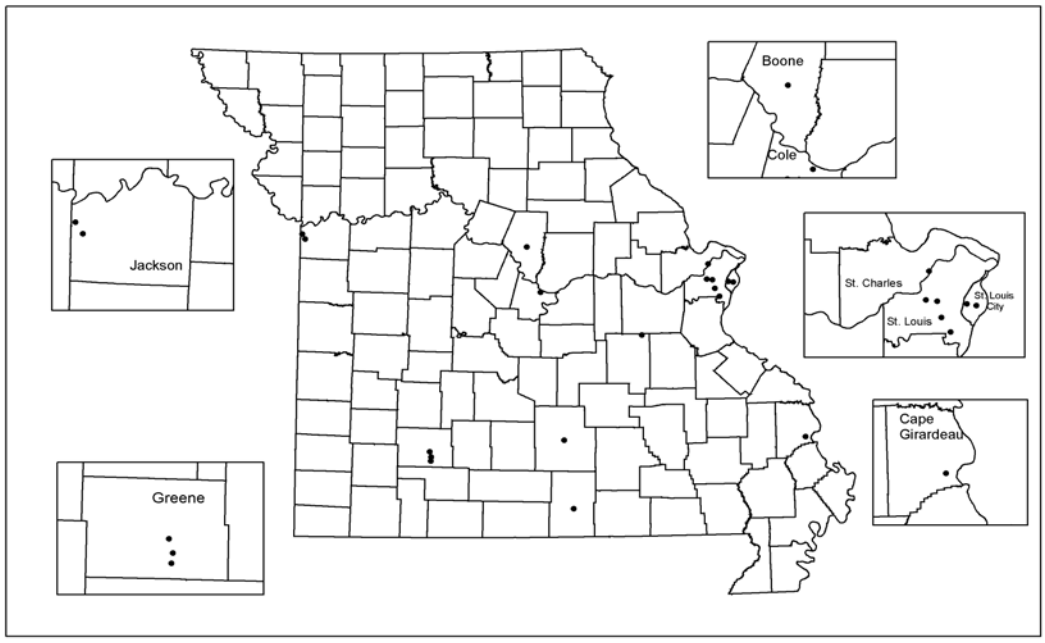
Location of Hospitals that have Written Emergency Department Care Protocols and Staff Training in Care Protocols for Acute Stroke Diagnosis/Treatment



Source: Missouri Heart Disease and Stroke Prevention Program

Map 2

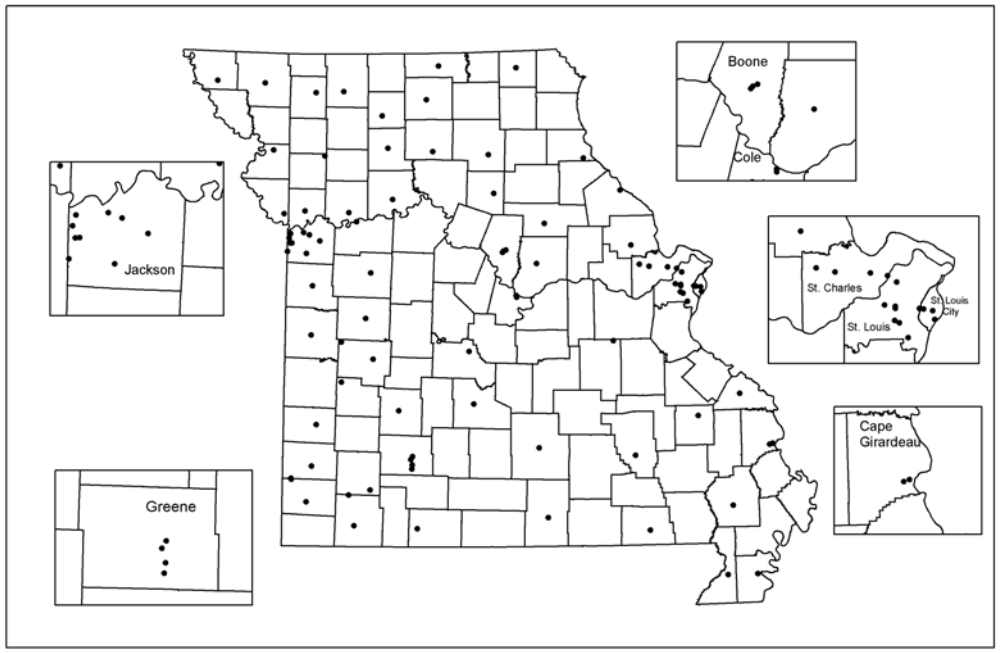
Location of Hospitals that have a Designated Stroke Team Available 24/7



Source: Missouri Heart Disease and Stroke Prevention Program

Map 3

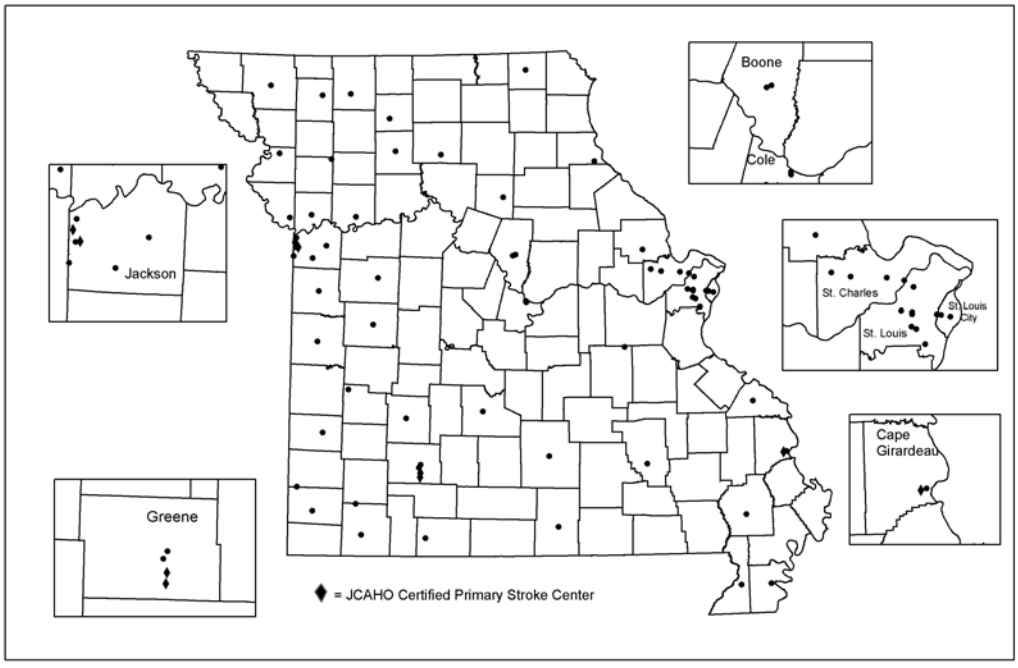
Location of Hospitals with Capacity for 24/7 Acute Stroke Diagnostic Testing
(CT scan & Expedited Lab Services with Results within 45 Minutes)



Source: Missouri Heart Disease and Stroke Prevention Program

Map 4

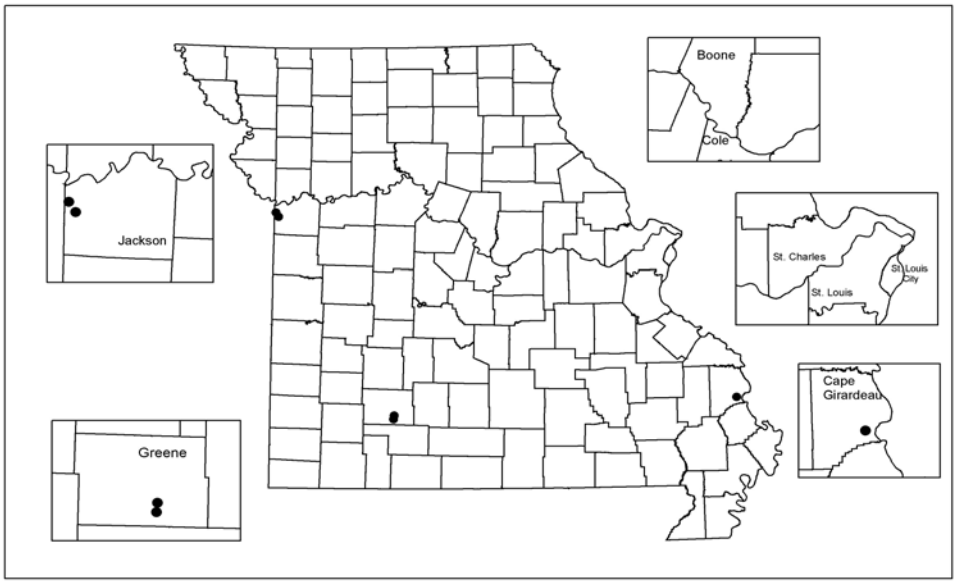
Location of Missouri Hospitals that Currently
Administer IV tPA for Acute Stroke Treatment



Source: Missouri Heart Disease and Stroke Prevention Program

Map 5

Location of Missouri Hospitals that are Currently Certified
by JCAHO as a Primary Stroke Center



Source: Missouri Heart Disease and Stroke Prevention Program

REFERENCE

Bureau of Health Informatics (BHI): Missouri Information for Community Assessment (MICA). Jefferson City, Missouri: Missouri Department of Health and Senior Services; accessed March 2006. http://www.dhss.mo.gov/MICA/

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Missouri Heart Disease and Stroke Prevention Program
P.O. Box 570
Jefferson City, MO 65102-0570
(800) 316-0935

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