Stroke Receiving Facility Toolkit

Utah State Stroke System
Stroke Receiving Facility

A Utah State Stroke System Toolkit
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Becoming a Stroke Receiving Facility

Overview
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Why Become a Stroke Receiving Facility?

Stroke is the third leading cause of death in the United States and Utah (Utah Heart Disease and Stroke Prevention Program, 2007, p.16). Between 2003 and 2007, the Utah mortality rate for stroke was 45.7 deaths per 100,000 population (Utah Department of Health: IBIS Public Health, 2009). Stroke is also the leading cause of long-term disability in the U.S. (Utah Heart Disease and Stroke Prevention Program, 2007, p. 16). In Utah, between 2003 and 2007, a total of 13,024 people visited the hospital for stroke (Utah Department of Health: IBIS Public Health, 2009). The state hospitalization rate decreased during these years, from a rate of 17.0 hospitalizations per 10,000 in 2003 to a rate of 14.0 hospitalizations for stroke per 10,000 in 2007 (Utah Department of Health: IBIS Public Health, 2009). Stroke is also a financial burden in Utah, and between 2001 and 2005, the average annual charge for all stroke hospitalizations and emergency department visits in Utah was $47 million, and government funds paid for the majority of those charges (Utah Heart Disease and Stroke Prevention Program, 2007, p. 36).

In 2007, 55.0% percent of stroke hospitalization discharges were from the four Joint Commission Certified Primary Stroke Centers (Primary Stroke Centers) in the state (Utah Department of Health: IBIS Public Health, 2009). Thus, just over half of Utah residents treated for stroke did so at a Primary Stroke Center, which is certified and recognized for stroke treatment, while 45% of the stroke discharges were from hospitals that were not designated for stroke treatment. Becoming a Stroke Receiving Facility in Utah signals to the Emergency Medical Services (EMS) and community members that the hospital is willing and competent to treat acute ischemic stroke victims, and has taken the necessary steps of preparation.

Hospitals that have established designated stroke facilities have demonstrated improved treatment, better patient outcomes, and reduced care costs (ACT for Stroke, 2006, p. 5). They have the required infrastructure and written protocols to stabilize and provide rapid, optimal, and efficient care to acute stroke patients (ACT for Stroke, 2006, p. 5).

One goal of the Utah State Stroke System is to help all hospitals in the state take the necessary steps, provided in this toolkit, to become a designated Stroke Receiving Facility for treatment of acute ischemic stroke. The Utah State Stroke System will consist of a “Spoke and Hub” System, where the “Hub” hospitals are the four Primary Stroke Centers in the state. These Primary Stroke Centers are: McKay-Dee Hospital in Ogden, Intermountain Medical Center in Murray, University of Utah Medical Center in Salt Lake City, and Utah Valley Regional Medical Center in Provo. All hospitals who wish to be designated Stroke Receiving Facilities by the state must follow the application process and requirements in this toolkit, and after submitting and receiving approval of an application, the hospital will be designated by the Department of Health (DOH), Bureau of EMS (BEMS), and Health Systems Improvement (HSI). EMS will be preferentially directed to take suspected stroke patients to the designated Primary Stroke Centers and Stroke Receiving Facilities in the state. Therefore, all hospitals are encouraged to complete the implementation and application process.

This toolkit will provide medical professionals and hospital administrators the necessary information to improve their hospital’s acute stroke care and become a designated Stroke Receiving Facility in Utah. Each hospital is invited to select the information that will best apply to the facility and plan its Stroke Receiving Facility implementation.
Overview of Stroke Receiving Facility Requirements

The following requirements must be met in a hospital to receive designation of a Stroke Receiving Facility.

1. **Acute Stroke Team**
   - 24/7 Physician authorized to treat stroke
   - 24/7 ED nurse trained to treat stroke
   - Stroke Coordinator
2. **Written Care Protocols**
   - Standardized stroke scales and treatment protocols
3. **Emergency Medical Services**
4. **Emergency Department (ED)**
   - Open 24/7
5. **Stroke Unit**
6. **Commitment and Support of Medical Organization**
7. **Neuroimaging Services**
   - 24/7 CT scan availability
   - Completed and interpreted within 45 minutes
8. **Laboratory Services**
   - Open 24/7
   - CBC, BMP, PT/PTT/INR completed within 45 minutes
9. **Outcomes and Quality Improvement Activities**
10. **Continuing Education**
Summary of Stroke Receiving Facility Requirements

The following summary includes specific requirements for designation of a Stroke Receiving Facility in Utah. It is an expansion of the outline listed on the previous page.

1. **Acute Stroke Team**
   a. Must include (and be available 24/7):
      - Neurologist or emergency medicine physician
        o Available to the bedside within 10-20 minutes of patient arrival.
        o A call roster of physicians trained to treat strokes must be maintained.
        o Immediate consultation with a stroke expert at a “Hub” hospital may be done in person, using Telestroke technology, or by other technology means.
        o “Hub” hospitals will provide 24/7 available consultation with a stroke expert to Stroke Receiving Facilities.
      - ED nurse, who is authorized to begin stroke protocol using the standardized medicines, forms, and protocols in this toolkit.
      - Stroke Coordinator
        o Collect and submit standardized data regularly to the State Stroke System Coordinator, Dr. Peter Taillac (information listed on next page).
   b. Team can also include: neurosurgeon, lab technician, radiologist, pharmacist, social worker, rehabilitation specialist.
   c. These members dedicate at least a portion of their time to stroke at the hospital and make stroke care a priority.
   d. Provide training on a continuing basis for new staff and for all staff each time a protocol is updated.

2. **Written Care Protocols**
   a. Standardized stroke scales and treatment protocols are listed in this toolkit and should be designed, adapted, and utilized by the team.
   b. Should include use of a written protocol for patients eligible to receive intravenous t-PA treatment (recombinant tissue plasminogen activator known as Activase or Alteplase) and other acute therapies such as stabilization of vital functions, provision of neuroimaging procedures.
   c. In eligible patients, t-PA must be administered within 3 hours of acute stroke symptom onset, and a CT scan must be obtained to exclude the presence of ICH.
   d. Protocols should also provide information regarding emergency care of acute ischemic strokes, stabilization of vital functions, initial diagnostic tests, and initial use of medications.
   e. Should be available where stroke patients may be evaluated or treated.
   f. Should be reviewed and updated at least once per year.
   g. The standardized pre-hospital stroke screening, treatment, and transportation to designated Primary Stroke Centers or Stroke Receiving Facilities in Utah will reduce the “door-to-needle” time of patients with acute ischemic strokes who may benefit from thrombolysis. It will also reduce the delay and improve the overall care of other stroke patients who may not qualify for thrombolysis (stroke symptoms>3 hours, hemorrhagic strokes, stuttering strokes or TIA's, severe HTN, etc.).

3. **Emergency Medical Services**
   a. Calls for possible stroke should be assigned high priority for evaluation and transport.
   b. EMS will use standardized pre-hospital treatment protocol, such as that listed in this toolkit, for suspected stroke patients.
   c. Educational activities should be offered yearly.
4. Emergency Department (ED)
   a. Must be open 24/7
   b. Personnel should be trained to diagnose and treat all types of acute strokes.
   c. ED should document performance measures such as time from symptom onset to treatment.
   d. Educational activities for ED staff should occur yearly to reinforce stroke diagnosis and treatment.

5. Stroke Unit
   a. Does not have to be a distinct unit, but it must provide continuous telemetry monitoring, written care protocols, and BP monitoring at all times.
   b. Personnel should have expertise in managing stroke care.

6. Commitment and Support of Medical Organization
   a. Stroke Receiving Facility should designate a Stroke Coordinator.
   b. Hospital administration should provide financial, logistical, and political support to garner needed resources.
   c. Importance of hospital administrative support cannot be overemphasized.

7. Neuroimaging Services
   a. CT scan
      - Available 24/7
      - Completed and interpreted within 45 minutes.
      - Interpreted by a radiologist, neurologist, or neurosurgeon.
      - Interpreted either in person, by teleradiology, or by other technology means.

8. Laboratory Services
   a. Available 24/7
   b. Completed within 45 minutes of being ordered: CBC, BMP, PT/PTT/INR

9. Outcome and Quality Improvement Activities
   a. Database or registry of stroke patients should be developed, including specific indicators such as performance measures or complication rates.
   b. Benchmarks for comparison should be established (can be selected from treatment guidelines).
   c. Facility should select at least 2 patient-care issues each year.
   d. Pre-specified committees should meet at least 3 times a year to review/modify practice patterns.

10. Continuing Education
    a. Stroke center personnel involved in patient care should have yearly continuing education related to stroke care.
    b. Stroke center should hold yearly public education programs on stroke risk factors, symptom recognition, prevention, etc.
    c. Materials are available from the DOH Heart Disease and Stroke Prevention Program.

Note: Stroke Receiving Facilities are encouraged to keep uncomplicated stroke patients during the duration of treatment. The Primary Stroke Centers in the state are available for consultation at any time during the patient’s hospitalization.

The following are DOH contacts for the Utah State Stroke System. Any questions on planning and operations can be directed to:

Peter Taillac, MD, FACEP  
Medical Director  
Bureau of EMS and Preparedness  
801.273.6646  
ptaillac@utah.gov

Robert Jex, RN, MS  
Stroke/STEMI Program Coordinator  
Bureau of EMS and Preparedness  
801.273.4161  
rjex@utah.gov
Stroke Receiving Facility Application Process

1. Hospitals wishing to become a Stroke Receiving Facility must submit a letter of intent to the DOH, using the address below, which states interest in designation and requests an application for designation as a Stroke Receiving Facility.

Applications may be requested from and returned to:

Robert F. Jex, RN, MHA, FACHE
Utah Department of Health
P.O. Box 142004
Salt Lake City, Utah 84114

The application can also be accessed at: www.hearthhighway.org

2. Upon receipt of the completed application, the DOH will review the application for completeness and schedule a site visit to the applicant hospital.

3. The department will select a team of qualified consultants and a department representative to document compliance with elements outlined in the application. Upon completion of the visit, the site team will review its findings with the hospital administrator and his or her representatives. Those findings will include the following:

   - Hospital Stroke Program Strengths
   - Weaknesses
   - Deficiencies
   - Any recommendations pertinent to the site visit

4. A report of those findings and a recommendation will be presented to the Stroke Advisory Committee, which will recommend to the DOH Executive Director either approval or denial of the application for designation.

5. A document of designation as a Utah Stroke Receiving Facility will be provided to the successful applicant, indicating that the hospital has complied with Stroke Receiving Facility requirements. This designation will be for a period of three (3) years from the date of the site visit.

6. Facilities with deficiencies that prevent designation as a Stroke Receiving Facility will be given the opportunity for a focused visit within the succeeding six (6) months to verify that the stated deficiencies have been corrected. Designation may then be awarded for a three (3) year period from the original site visit.

Please see Appendix D for the actual Utah Stroke Receiving Facility Application.
<table>
<thead>
<tr>
<th>Medical Treatment and Protocol</th>
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<tbody>
<tr>
<td><strong>EMS Protocol</strong></td>
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<tr>
<td><strong>Initial Treatment/Triage</strong></td>
</tr>
<tr>
<td><strong>Stroke Protocol</strong></td>
</tr>
<tr>
<td><strong>NIH Stroke Scale</strong></td>
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</tbody>
</table>
EMS Protocol

EMS are essential in providing improved care to stroke victims, and protocol must be followed. EMS will use standardized pre-hospital treatment protocol for suspected stroke patients, as part of the Utah State Stroke System. The following are guidelines for stroke patients for all EMS in Utah.

On Scene:
1. Manage ABCs (Airway, Breathing, and Circulation). Give oxygen if needed.
2. Perform prehospital stroke assessment using the Cincinnati Stroke Scale.
   - **Facial Droop** (have patient smile)
     - **Normal**: Both sides of face move equally
     - **Abnormal**: One side of face does not move as well

   ![Facial Droop Image]

   - **Arm Drift** (have patient hold arms out for 10 seconds)
     - **Normal**: Both arms move equally or not at all
     - **Abnormal**: One arm drifts compared to the other, or does not move at all

   ![Arm Drift Image]

   - **Speech** (have patient speak a simple sentence)
     - **Normal**: Patient uses correct words with no slurring
     - **Abnormal**: Slurred or inappropriate words, or mute

3. Establish and record an **exact time**, in military time, when patient was “Last Seen Normal.”
In Transit:
1. Rapidly transport to closest Stroke Receiving Facility.
2. Bring witness or family member if possible, or record the names and phone numbers of witnesses.
3. Alert the receiving emergency department.
4. Check and record blood glucose to assess for hypoglycemia.
5. Check and record blood pressure. Do NOT administer any hypertensive medication without physician approval.
6. Establish cardiac monitoring and IV access with large bore catheter, if possible.

(Photos from http://www.strokecenter.org/trials/scales/cincinnati.html)
Initial Treatment/Triage

When the stroke victim is admitted to the ED, begin stroke protocol. The goal of this protocol should be to rapidly adminster t-PA (recombinant tissue plasminogen activator known as Activase or Alteplase) in appropriately screened candidates. Refer to the Stroke Protocol Algorithm at the end of this section, as well as the following evaluation and intervention steps, which should occur concurrently with each other. To view protocols from Stroke-certified hospitals in Utah, please refer to the Samples of Protocols in the Appendix.

The following are NIH recommendations:
- The "door to first physician contact" goal is within 10 minutes.
- The "door to initiation of CT scan" goal is within 25 minutes.
- The "door to drug" goal for thrombolytic treatment is within 60 minutes.

It is essential to notify the stroke team, lab, pharmacy, and CT as soon as the call comes into ED.

Evaluation:

1. Review History and t-PA Treatment Indications and Contraindications and Baseline NIHSS
   Take a complete patient history, including a review of indications and contraindications for treatment with t-PA. Evaluate for the mimics of stroke as well.

2. Perform Vital Signs Every 15 Minutes with Neuro Checks (Not NIHSS)
   It is the standard of practice to perform a baseline NIHSS neurological assessment. For subsequent neuro checks, it is appropriate to use a less extensive tool. Performing a full NIHSS assessment every 15 minutes is often not feasible nor is it a good use of time. This following neuro check is an option:
   - **Level of Consciousness** – measures the level of alertness of the patient
     - Is the patient alert, alert with stimulation or requires repeated stimulation to remain alert, or comatose?
     - Is the patient able to correctly mouth his/her name and age?
     - Is the patient able to correctly follow simple commands of opening and closing his/her eyes?
   - **Motor Functions** – measures the motor functions and patient’s ability to follow commands
     - Is the patient able to perform a series of arm movements?
     - Is the patient able to perform a series of leg movements?
   - **Language Skills** – measures the amount of aphasia and dysarthria in response to asking patients to describe an item or read several sentences

3. Record Weight (Do NOT estimate)

4. Draw Blood for Lab Tests: CMP, CBC with platelets, PT, PTT

5. Perform EKG

6. Perform CT Head without Contrast
   A CT scan without contrast must be performed prior to treatment with t-PA, primarily for the purpose of excluding hemorrhage. If patient has hemorrhage, please STOP following these directions.

**Intervention:**

1. **Educate Patient and Family**
   A process should be in place for the patient and family that will rapidly orient them to the suspected diagnosis, ED process, tests to be performed, t-PA treatment and its risks, and other treatment measures to be considered. This could include caregiver face-to-face interaction with the patient and family as well as teaching tools in written form. Education should be documented in the medical record.

2. **Treat Hypertension If Greater than 185 Systolic and 110 Diastolic**

3. **Initiate Two Large Bore IV Lines**
   Two large bore intravenous lines (18 gage or larger) should be started so that t-PA (recombinant tissue plasminogen activator known as Activase or Alteplase) may have a dedicated line.

4. **Start IV Fluids**
   Treatment with a 0.9% normal saline at a rate of 75 to 125 cc/hr or 2-3 L/day should be administered to avoid dehydration. The rate may be adjusted for febrile patients. IV fluids are particularly important for patients in whom oral intake is prevented or limited by swallowing problems. Dehydration is fairly common on admission in stroke patients.

5. **Treat Hyperthermia**
   Interventions for patients with temperatures of greater than 37.5 degrees C (99.5 degrees F) include appropriate dosing of acetaminophen (1 gram orally or 650 mg rectally every four to six hours, not to exceed 4-6 grams in 24 hours) and regular monitoring of temperature status (every four hours). For those patients with extreme hyperthermia greater than 39.4 degrees C (103 degrees F), aggressive interventions including cooling blankets and ice packs are encouraged. Causes for temperature elevation should be sought and treated. Early hyperthermia in acute stroke is associated with increased risk of poor outcome, higher mortality, and increased infarct volume.

6. **Treat Hyperglycemia**
   Hyperglycemia may adversely influence clinical outcome. Early identification of patients with hyperglycemia in the setting of acute ischemic stroke or in those at risk for cerebral ischemia (ED evaluation of glucose level) is recommended.
   - Avoid any agents or factors which might induce hyperglycemia.
   - Eliminate glucose from any IV solutions used. (Recommend use of normal saline.)
   - Avoid use of corticosteroids, even in those patients with cerebral edema, as they are not helpful and may be harmful. Separate recommendations are needed for those on maintenance corticosteroids, for concurrent conditions, and treatment decisions are left to the discretion of the physician.
   - Use appropriate measures to maintain euglycemia, carefully avoiding hypoglycemia.
   - Continue to monitor glucose with bedside testing in those receiving treatment in order to maintain euglycemia.

   It remains unclear whether early hyperglycemia in the setting of acute stroke is a marker of physiologic stress or an independent predictor of poor outcome. Usual management of hyperglycemia (glucose levels greater than 140 mg/dL) with gentle dosing of subcutaneous insulin, avoiding hypoglycemia, in a timely manner during acute ischemia would seem prudent until ongoing clinical trials address the appropriateness of more aggressive treatment measures.

7. **Initiate t-PA if patient meets criteria** (See Activase Mixing Directions, and review the contraindications.)

8. **Admit to Intensive Care Unit**
   (National Guideline Clearinghouse and Institute for Clinical Systems Improvement, 2008)
Stroke Protocol Algorithm

Identify signs of possible stroke

Critical EMS assessments and actions
- Support ABCs; give oxygen if needed
- Perform prehospital stroke assessment
- Establish time when patient last known normal (Note: therapies may be available beyond 3 hours from onset)
- Alert Hospital
- Check glucose if possible
- Transport; consider triage to a Stroke-Receiving Facility; bring a witness or family member, or get the names and phone numbers of witnesses.

ED Arrival: 10 min
Immediate general assessment and stabilization
- Assess ABCs, vital signs
- Provide oxygen if hypoxemic
- Obtain IV access and blood samples
- Check glucose; treat if indicated
- Perform neurologic screening assessment
- Activate stroke team
- Order emergent CT scan of brain
- Obtain 12-lead ECG

ED Arrival: 25 min
Immediate neurologic assessment by stroke team or designee
- Review patient history
- Establish symptom onset
- Perform neurologic examination (NIHSS)
- Check for fibrinolytic exclusions
- Repeat neurologic exam: are deficits rapidly improving to normal?

ED Arrival: 45 min
Does CT scan show any hemorrhage?

No Hemorrhage
Probable acute ischemic stroke; Consider fibrinolytic therapy
- Check for fibrinolytic exclusions
- Repeat neurologic exam: are deficits rapidly improving to normal?

Hemorrhage
Consult neurologist or neurosurgeon; consider transfer if not available

ED Arrival: 60 min
Patient remains candidate for fibrinolytic therapy?

Candidate
Review risks/benefits with patient and family.
If Acceptable:
- Give t-PA
- No anticoagulants or antiplatelet treatment for 24 hours

Not a Candidate
Administer Aspirin

- Begin stroke pathway
- Admit to stroke unit if available
- Monitor BP; treat if indicated
- Monitor neurologic status; emergent CT if deterioration
- Monitor blood glucose; treat if needed
- Initiate supportive therapy; treat comorbidities
**NIH Stroke Scale**

This scale measures the level of impairment caused by a stroke, and helps to assess whether or not the degree of disability caused by a given stroke merits treatment with t-PA (recombinant tissue plasminogen activator known as Activase or Alteplase). A maximal score of 42 represents the most severe and devastating stroke. Current guidelines as of 2008 allow strokes with scores greater than 4 points to be treated with t-PA.

See attached NIH Stroke Scale for full scale. Below is a modified version:

**Instructions:** Administer stroke scale items in the order listed. Record performance in each category by circling the number in the “Score” column. Do not go back and change scores. Follow directions provided for each exam technique. Scores should reflect what the patient does, not what the clinician thinks the patient can do. The clinician should record answers while administering the exam and work quickly. Except where indicated, the patient should not be coached (i.e., repeated requests to patient to make a special effort).

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
</table>
| **1a. Level of Consciousness**  
(Is the patient alert, drowsy, etc?) | Alert  
Drowsy  
Stuporous  
Coma | 0  
1  
2  
3 |
| **1b. LOC Questions**  
(Ask patient the month and his/her age. Patient must be exactly right.) | Answers both correctly  
Answers one correctly  
Both incorrect | 0  
1  
2 |
| **1c. LOC Commands**  
(Ask patient to open/close eyes and then grip/release nonparetic hand.) | Obeys both correctly  
Obeys one correctly  
Both incorrect | 0  
1  
2 |
| **2. Best Gaze**  
(Only horizontal movement tested. Oculocephalic reflex is OK, but not calorics. Eyes open-patient follows finger or face.) | Normal  
Patient gaze palsy  
Forced deviation | 0  
1  
2 |
| **3. Visual**  
(Test by confrontation. Introduce visual stimulus to patient’s upper and lower field quadrants.) | No visual loss  
Partial hemianopia  
Complete hemianopia  
Bilateral hemianopia | 0  
1  
2  
3 |
| **4. Facial Palsy**  
(Ask patient to show teeth/smile, raise eyebrows and squeeze eyes shut.) | Normal  
Minor  
Partial  
Complete | 0  
1  
2  
3 |
| **5a. Motor Arm Left**  
(Extend left arm, palm down, to 90 degrees if sitting or 45 degrees if supine.) | No drift  
Drift  
Can’t resist gravity  
No effort against gravity  
No movement  
Amputation, joint fusion | 0  
1  
2  
3  
4  
UN |
| **5b. Motor Arm Right**  
(Extend left arm, palm down, to 90 degrees if sitting or 45 degrees if supine.) | No drift  
Drift  
Can’t resist gravity  
No effort against gravity  
No movement  
Amputation, joint fusion | 0  
1  
2  
3  
4  
UN |
6a. Motor Leg Left  
(Elevate left leg to 30 degrees and flex at hip, always supine.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No drift</td>
<td>0</td>
</tr>
<tr>
<td>Drift</td>
<td>1</td>
</tr>
<tr>
<td>Can’t resist gravity</td>
<td>2</td>
</tr>
<tr>
<td>No effort against gravity</td>
<td>3</td>
</tr>
<tr>
<td>No movement</td>
<td>4</td>
</tr>
<tr>
<td>Amputation, joint fusion</td>
<td>UN</td>
</tr>
</tbody>
</table>

6b. Motor Leg Right  
(Elevate left leg to 30 degrees and flex at hip, always supine.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No drift</td>
<td>0</td>
</tr>
<tr>
<td>Drift</td>
<td>1</td>
</tr>
<tr>
<td>Can’t resist gravity</td>
<td>2</td>
</tr>
<tr>
<td>No effort against gravity</td>
<td>3</td>
</tr>
<tr>
<td>No movement</td>
<td>4</td>
</tr>
<tr>
<td>Amputation, joint fusion</td>
<td>UN</td>
</tr>
</tbody>
</table>

7. Limb Ataxia  
(Finger-nose, heel-shin tests done on both sides.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>0</td>
</tr>
<tr>
<td>Present in one limb</td>
<td>1</td>
</tr>
<tr>
<td>Present in two limbs</td>
<td>2</td>
</tr>
</tbody>
</table>

8. Sensory  
(Use a pinprick to face, arm, trunk, and leg – compare side to side. Assess patient’s awareness of being touched.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>0</td>
</tr>
<tr>
<td>Partial loss</td>
<td>1</td>
</tr>
<tr>
<td>Severe loss</td>
<td>2</td>
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</tbody>
</table>

9. Best Language  
(Ask patient to name items, describe a picture, read a sentence; intubated patients should write responses.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No aphasia</td>
<td>0</td>
</tr>
<tr>
<td>Mild to moderate aphasia</td>
<td>1</td>
</tr>
<tr>
<td>Severe aphasia</td>
<td>2</td>
</tr>
<tr>
<td>Mute</td>
<td>3</td>
</tr>
</tbody>
</table>

10. Dysarthria  
(Evaluate speech clarity by asking patient to repeat listed words.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal articulation</td>
<td>0</td>
</tr>
<tr>
<td>Mild to moderate dysarthria</td>
<td>1</td>
</tr>
<tr>
<td>Near to unintelligible</td>
<td>2</td>
</tr>
<tr>
<td>Intubated or other barrier</td>
<td>UN</td>
</tr>
</tbody>
</table>

11. Extinction and Inattention  
(Use information from prior testing to identify neglect or double simultaneous stimuli testing.)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
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<tbody>
<tr>
<td>No neglect</td>
<td>0</td>
</tr>
<tr>
<td>Partial neglect</td>
<td>1</td>
</tr>
<tr>
<td>Complete neglect</td>
<td>2</td>
</tr>
</tbody>
</table>

NIH Stroke Scale visual attachments are on the following pages.

(View full NIH Stroke Scale online at [http://www.ninds.nih.gov/doctors/NIH_Stroke_Scale_Booklet.pdf](http://www.ninds.nih.gov/doctors/NIH_Stroke_Scale_Booklet.pdf))
NIH Stroke Scale

Test 9
You know how.

Down to earth.

I got home from work.

Near the table in the dining room.

They heard him speak on the radio last night.
MAMA
TIP – TOP
FIFTY – FIFTY
THANKS
HUCKLEBERRY
BASEBALL PLAYER
Evaluation and Improvement

QI Improvements
Educational Resources
QI Improvements and Performance Measures

A key component of improving the quality of stroke care involves monitoring key performance measures that will tell you what your strengths are and what areas need improvement. Determine the goals for your hospital’s stroke center and select several indicators that will help achieve them. For example, if your goal is to improve quality of care, then you would consider monitoring door-to-needle time, door-to-CT time, the percentage of eligible patients treated with t-PA, clinical outcomes (stroke scale results), the prevention of complications, or customer satisfaction.

The Stroke Receiving Facility designation process will require the monitoring and reporting on specific performance measures. By aligning your goals with these performance measures, you will be able to identify successes and areas where improvement is needed.

Some performance measures and systems for monitoring change include:

- Length of stay
- Cost/charge per stroke patient
- Diagnostic/bed utilization
- Clinical outcomes
- Eligible patients treated
- Time data
- Prevention of complications
- Customer satisfaction
Educational Resources

The following websites are recommended for more information on stroke care and treatment.

**American Heart Association**  
[http://learn.heart.org/](http://learn.heart.org/)  
- Distance Learning via Printed Material, DVD, CD-ROM  
  - A Clinician’s Guide to Thrombosis DVD and Monograph  
  - Stroke: Improving the Chain of Recovery  
- Online Courses, Webinars and Webcasts  
  - Get With the Guidelines on-line courses  
  - NIHSS Stroke Scale Training and Certification  
  - Focus on Acute Ischemic Stroke and Thrombolytics 2007  
  - Stroke Pre-hospital care  
- Podcasts/Audiocasts  
  - Key Findings: An International Stroke Conference Podcast  
- Satellite Broadcasts with Web Course Archives  
  - Ischemic Stroke: Risk Factors and Primary Prevention Strategies  
  - Risk Factor Control for Stroke: Secondary Prevention Strategies

**Brain Attack Coalition**  
- Guidelines and example Hospital Admission Orders, Physician Orders, and pertinent checklists.  
- Patient Resources

**Medical Priority Consultants**  
[www.medicalpriority.com](http://www.medicalpriority.com)  
- For medical dispatchers: The EMD Advancement Series: The MPDS Stroke Protocol

**National Guideline Clearinghouse**  
- Diagnosis and initial treatment of ischemic stroke

**National Institute for Neurological Disorders and Stroke**  
- NIH Stroke Scale  
- NIH Stroke Scale Training DVD

**National Stroke Association**  
[www.stroke.org](http://www.stroke.org)  
- Guidelines  
  - Building the Case for a Primary Stroke Center: A Resource Guide  
- On-line Courses  
  - For EMS providers: Stroke rapid response on-line or classroom training  
- NIH Stroke Scale Exam, Scoring and Registration Service  
- Stroke Nurse Education Modules  
  - [www.stroke.org/strokenurse](http://www.stroke.org/strokenurse)  
  - Developed in partnership with the American Association of Neuroscience Nurses. These accredited online modules are ideal for those who are new to stroke as well as for seasoned
stroke care providers committed to keeping their stroke knowledge and practice up-to-date. The completion of all 10 modules will result in the achievement of a minimum of eight contact hours consistent with The Joint Commission’s requirements for core stroke team members.

**North Carolina AHEC**  
[www.ahecconnect.com/courses](http://www.ahecconnect.com/courses)  
- Dysphagia Assessment: A Screening Protocol for Stroke Patients  
- Saving Lives: Understanding Stroke- 911 Telecommunicators  
- Saving Lives: Understanding Stroke- EMS Providers

**The Sullivan Group**  
- Web-based education that offers contact hours for both physicians and nurses. Most modules are 1 to 1.5 contact hours.

**Utah Heart Disease and Stroke Prevention Program**  
[www.hearthhighway.org](http://www.hearthhighway.org)  
- Provides local stroke public health and preventative information and resources.
Appendices

Utah State Stroke System
## Acute Stroke Report to Receiving Facility

<table>
<thead>
<tr>
<th>Reporting Physician</th>
<th>Date</th>
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<tr>
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<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Age</th>
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<table>
<thead>
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<th>Current Medications</th>
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<table>
<thead>
<tr>
<th>Family Contact</th>
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<table>
<thead>
<tr>
<th>DNR/DNI Status</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Time of onset or last known normal</th>
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</table>

### History

How was this information acquired? Note progression of symptoms, or time course of any changes in physical examination.

### Physical

Presenting neurological signs of stroke and current deficits. Any associated seizure or migraine

### National Institute of Health Stroke Scale (NIHSS)

<table>
<thead>
<tr>
<th>Measured Current Weight</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
<th>Heart Rate</th>
<th>Temperature</th>
<th>Glucose</th>
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</table>

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th>Respiratory Rate</th>
<th>Oxygen LPM</th>
<th>SPO2</th>
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</tbody>
</table>

### Treatment & Interventions

including: BP management, medications given, procedures

<table>
<thead>
<tr>
<th>Was IV rt-PA given?</th>
<th>Time of IV rt-PA Bolus</th>
<th>End Time IV rt-PA infusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>IV rt-PA Exclusion if not given</th>
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<tbody>
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<td></td>
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</table>

### Lab Results

<p>| |</p>
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### Diagnostic Imaging

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### ECG

<p>| |</p>
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</tbody>
</table>
ACUTE STROKE TREATMENT KIT

- 0.9% Sodium Chloride Inj (1)
- 18 G Angio-Cath (1) 2
- 22 G Angio-Cath (4)
- 10 mL Latex Free Leur-Lok syringe (2)
- 10 mL Leur-Lok Syringe (2)
- 10 mL 20G 1 ½ Latex Free Syringe with needle (2)
- 30 mL syringe with Leur-Lok Tip (2)
- Arterial Blood Sampling Kit (1)
- I.V. Start Fak (1)
- 18 G 1 Needle (5)
- 19 G 1 ½ Filter Needle (2)
- 25 G 5/8 Needle (1)

- Primary I. V. Administration Set Checkvalve, 2 Y-Injection Sites (3)
- Interlink System, Buretrol Add-On Set 17” (43 cm) 150 mL Valveless Burette Slide Clamp
- Lab Drawing Supplies (misc)
- Latex Powder-Free Exam Gloves (box)
- NIH Stroke Scale Instructions and Definitions
- rt-PA Dosing Chart (1)
- Alcohol Wipes (12)

MEDICATIONS
- Aspirin 325 mg rectal suppository
- Labetalol
- Hydralazine
# Clot Buster Kit

<table>
<thead>
<tr>
<th>Medications</th>
<th>Quantity</th>
<th>Order #</th>
<th>Exp. Date</th>
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<td>Activase (alteplase) 100mg</td>
<td>1</td>
<td>McKesson 243-0254</td>
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<tr>
<td>NS Flushes</td>
<td>4</td>
<td>McKesson 278-0872</td>
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<table>
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<tr>
<th>Supplies</th>
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<tr>
<td>Infusion Set</td>
<td>1</td>
<td>C72109E</td>
</tr>
<tr>
<td>Primary IV Set</td>
<td>1</td>
<td>11961-68</td>
</tr>
<tr>
<td>Insyte Autoguard 22GA, 1in x 2</td>
<td>2</td>
<td>BD 381423</td>
</tr>
<tr>
<td>Insyte Autoguard 20 GA, 1.16in x 2</td>
<td>2</td>
<td>BD 381434</td>
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<tr>
<td>Insyte Autoguard 20 GA, 1in x 2</td>
<td>2</td>
<td>BD 381433</td>
</tr>
<tr>
<td>Insyte Autoguard 18 GA, 1.16in</td>
<td>2</td>
<td>BD 381444</td>
</tr>
<tr>
<td>Insyte Autoguard 16 GA, 1.16in</td>
<td>2</td>
<td>BD 381454</td>
</tr>
<tr>
<td>Clave Connector</td>
<td>3</td>
<td>11956</td>
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<tr>
<td>10mL Syringes</td>
<td>4</td>
<td>BD 309604</td>
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<tr>
<td>Sterile Latex Free IV Start</td>
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<td>C. Health 01-9300</td>
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<td>Alcohol Preps</td>
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<td>Extension Set, 8 inch</td>
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<td>Lifeshield 19197</td>
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<tr>
<td>Transfer Needles</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>18 G Needle</td>
<td>4</td>
<td>BD 305195</td>
</tr>
<tr>
<td>3-Way Large Bore Stopcock</td>
<td>2</td>
<td>Baxter 2C6201</td>
</tr>
</tbody>
</table>
IV TPA Consideration & Eligibility Checklist
for Acute Ischemic Stroke

Today’s date ___/___/______

Onset of stroke symptoms: Date ___/___/______ Time ___ : ___
- Symptoms were witnessed or self-observed at time of onset
- "Time of onset" is when patient was last known at baseline

Latest acceptable time for TPA administration: Time ___ : ___

Eligibility Criteria (ALL boxes must be checked before IV TPA can be considered):
- Age 18 years or older
- Clinical diagnosis of ischemic stroke causing acute, measurable neurological deficits (NIHSS ≥ 4) that are NOT rapidly improving. NIHSS = _____ (worksheet attached)
- Time of symptom onset well established to be less than 180 minutes before treatment to begin
- No evidence of intracranial hemorrhage on noncontrast head CT
- No high clinical suspicion of subarachnoid hemorrhage even with normal CT
- No active internal bleeding (e.g. gastrointestinal or urinary) within the past 21 days
- Platelet count ≥100,000/mm³
- If receiving heparin in previous 48 hours, aPTT must be in normal range
- If recent use of anticoagulant (e.g. warfarin sodium), INR ≤ 1.7
- No intracranial surgery, serious head trauma, or previous ischemic stroke within the past 3 months
- No history of intracranial hemorrhage, arteriovenous malformation, aneurysm or brain lesion (tumor)
- No major surgery or serious trauma within the past 14 days
- No lumbar puncture within the past 7 days
- On repeated measurement, systolic BP <165mm Hg or diastolic BP <110mm Hg at time of treatment
- OR hypertension NOT requiring aggressive treatment to reduce BP to within these limits
- Serum glucose >50 or <400 mg/dL
- No arterial puncture at non-compressible site within the past 7 days
- No witnessed seizure at stroke onset
- No acute myocardial infarction within last 3 months
- Not a pregnant or lactating female
- TPA consent form signed by patient or proxy OR best clinical judgment rendered if patient is unable to give consent and relative or proxy is not immediately available and would delay treatment.

RELATIVE CONTRAINDICATIONS: Final decision to administer TPA will be made by the on-call Neurologist.

- Severe neurological deficit (NIHSS >22)
- Early CT signs in area of suspected acute infarction

ALTERNATE TREATMENT: Patient may be eligible for intra-arterial (IA) TPA or mechanical removal if symptoms persist for up to 6 or 8 hours, respectively, from onset (may be longer for posterior circulation stroke). Contact the on-call Interventional Radiologist if patient cannot receive IV TPA, as soon as possible, to determine eligibility.

IV TPA ADMINISTERED. TIME _____ : _____

IV TPA NOT ADMINISTERED BECAUSE:
- Patient / family refuses TPA treatment
- CT findings contraindicate TPA
- Other

Symptoms resolved, rapidly improving or too mild
Delay in patient arrival. Outside 3-hour window.
Treated with IA TPA or mechanical device

Completed by ________________________, MD Date ______________________

IV TPA Eligibility Checklist
for Acute Ischemic Stroke

MDH6237CC-05 (Revised 04/08)
ED Acute Neurologic Deficit Guideline

MDH6424CC-07 (Revised 06/08)

Page 1
Samples of Protocols
Appendix B - 2: McKay-Dee Hospital Stroke Protocol

CT Findings

Goal: 45 min

No Hemorrhage

Persistent Deficit

NO

TIA

Subarachnoid Bleed

- Neurosurgical Consult
- Hypertension control per neurosurgical orders
- Reverse coagulopathy
  - ASA 325 mg PR ONCE
  - Consider admission to Medicine for carotid ultrasound, telemetry, lipids, HgbA1C, ECHO
- Admit to IMC or ICU

YES

STROKE

Intracerebral Bleed

- Neurosurgical Consult
- Initiate Hemorrhagic Stroke Hypertension Protocol for SBP greater than/equal to 160 mmHg on 2 readings 5 min apart.
- Treatment goal per Hemorrhagic Stroke Hypertension Protocol
- Reverse coagulopathy
- ASA 325 mg PR ONCE
- Admit to IMC or ICU

Treatment Options

Criteria

- less than 3 hrs since last known well*
- Eligibility checklist completed
- Notify on-call Neurologist

BP Control

- less than 6 hrs since last known well (IA-TPA) *
- less than 6 hrs since last known well (retrieval device) *
- Consider consultation if CT shows M1-2, A1-2, or posterior occlusion; contact Neurologist and Interventional Radiologist

Disposition

ICU: post-TPA or retrieval device
IMC: unstable stroke patients with severe hemiplegia, aphasia with significant communication barriers, altered or decreased level of consciousness, documented or suspected brainstem or cerebellar stroke, or any blood pressure greater than 160/90 in ED; no TPA intervention done
Medical: stable stroke patients; TIA patients; no TPA

* all times may be extended up to 24 hrs for posterior circulation symptoms; consultation with Neurologist suggested

Date: ____________ Time: ______

MD: ___________________________________________________________________

ED Acute Neurologic Deficit Guideline
MDH-0424CC-07 (Revised 05/08)
McKay-Dee Emergency Department
Stroke Protocol

All orders to be completed

Allergies: ________________________________

Monitoring
- Obtain weight
- Ensure 2 large bore IVs in place – 18 gauge
- Place Foley catheter before tPA started
- NPO
- Bedrest
- Continuous cardiac monitoring
- Vital signs and neuro checks q 15 minutes for 2 hours after start of tPA infusion
- Notify physician if SBP ≥ 180 or < 120 mmHg, DBP ≥ 105 or < 60 mmHg, changes in neurologic status, OR any signs of bleeding
- Transfer patient to ICU for continued monitoring

Medications
- Administer tPA (alteplase) as follows:
  - Total Dose (see chart on back): Weight in kg _____ X 0.9 mg = _____ mg (Total dose not to exceed 90 mg)
  - Bolus Dose: 10% of total calculated dose = _____ mg IV over 1-2 minutes using infusion pump
  - Document time infusion started: ____________
  - Infusion Dose: 90% of total calculated dose = _____ mg IV over 60 minutes using infusion pump. Flush line with 50 ml NS after completion of tPA.
- Initiate Ischemic Stroke Hypertension Protocol for SBP ≥ 180 mmHg or DBP ≥ 105 mmHg on two separate readings 5 min apart. Treatment goal: 10-20% decrease but kept within 160-179/90-104 mmHg.
- No heparin, enoxaparin, warfarin, clopidogrel, or aspirin for 24 hours after completion of tPA infusion
- IV fluids: Sodium Chloride 0.9% @ 100 ml/hour after tPA infusion completed

Date: __________ Time: __________
MD: ____________________________

IV tPA (alteplase) Orders
MDH6274CC-06 (Revised 06/08)
Ischemic Stroke Hypertension Protocol

TREATMENT GOALS AND CALL PARAMETERS ON REVERSE SIDE

Treat based upon severity of hypertension/patient scenario:
1) Diagnose for TIA: SBP 165-229, DBP 110-129
2) Treated with TPA: SBP 160-229, DBP 110-129
3) Not-eligible for TPA: SBP 220-259, DBP 130-159
   on 2 readings 5 min apart. Call MD.

Ischemic Stroke

SBP>240 or DBP>140
   on 2 readings 5 min apart.

Labetalol 10 mg IV X 1 over 2 minutes.
   Call MD if received recommended max dose IV + boluses = 300 mg in 24 hr
   *If Heart Rate < 60 or patient with COPD, cardiomyopathy, asthma, or CHF.
   Bolus hydralazine 10 mg IV X 1 over 2 min instead of labetalol and call MD for orders to
   start nicardipine or nitropusside drip.

Check BP every 5 min until stable, then every 10 min for 1 hr, then as previous order.

YES Goal reached within 10 min?

NO

Start labetalol drip at 1 mg/min. Titrate
   every 10 min to max rate of 5 mg/min. Rate range is
   0.1 to 5 mg/min. Call MD if at max rate for 30 min or infusion
   stopped.

YES

Labetalol 30 mg IV over 2 min.

Goal reached within 10 min?

NO

Labetalol 40 mg IV over 5 min.

YES

Goal reached within 10 min?

NO

Labetalol 80 mg IV over 5 min.

YES

Goal reached within 10 min?

NO

Start nicardipine drip at 5 mg/hr.
   Titrato for effect by 2.5 mg/hr every 10 min
to max of 15 mg/hr.

YES

Goal reached within 30 min?

NO

Change to nitroprusside drip.
   Place arterial line. Call MD.

MD: ______________ Date: ________ Time: __________

MDH6273CC-06 (Reviewed 02/09)

This protocol is designed for the general use
of most patients, but may need to be adapted
to meet the special needs of a specific patient
as determined by the patient’s care giver.
## Ischemic Stroke Hypertension Protocol

<table>
<thead>
<tr>
<th>Patient Scenario</th>
<th>Eligible for TPA (ED)</th>
<th>Treated with TPA (ED, ICU)</th>
<th>Not eligible for TPA (ED, IMC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP to Treat</td>
<td>SBP ≥185 or DBP ≥110</td>
<td>SBP ≥180 or DBP ≥105</td>
<td>SBP ≥220 or DBP ≥120</td>
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<tr>
<td>BP Monitoring</td>
<td><strong>AFTER BOLUSES:</strong></td>
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<td></td>
<td>- every 5 min until</td>
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<td>stable, then every</td>
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<td>10 min for 1 hr,</td>
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<td>then per previous</td>
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<td>order</td>
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<td><strong>DURING CONTINUOUS</strong></td>
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<td>INFUSION:**</td>
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<td>- every 5 min during</td>
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<td>infusion</td>
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<td></td>
<td>- every 10 min on</td>
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<tr>
<td></td>
<td>stable infusion rate</td>
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<tr>
<td>Treatment Goal/Range</td>
<td>SBP 160-184</td>
<td>SBP 160-179</td>
<td>SBP 160-219</td>
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<tr>
<td></td>
<td>DBP 90-109 (10-20%</td>
<td>DBP 90-104 (10-20%</td>
<td>DBP 90-119 (10-20%</td>
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<td>decrease)</td>
<td>decrease)</td>
<td>decrease)</td>
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<tr>
<td>Call MD for:</td>
<td>BP &lt;120/60 mmHg at</td>
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<td>any point. Stop</td>
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<td>any antihypertensive</td>
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<td>drips if running.</td>
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</table>

*This protocol is designed for the general use of most patients, but may need to be adapted to meet the special needs of a specific patient as determined by the patient’s care giver.*

MDH6273CC-06 (Reviewed 02/09)
INFORMED CONSENT FOR ADMINISTRATION OF tPA (Alteplase) FOR ACUTE ISCHEMIC STROKE

You (or your relative) have a stroke caused by blockage of an artery to the brain by a blood clot. Many patients become more seriously ill immediately after the stroke, even with state-of-the-art treatment. Of those who survive, most patients will have some degree of permanent disability.

You might benefit from a drug given by vein, called alteplase (tPA), that dissolves blood clots. This drug is approved by the Food and Drug Administration (FDA) for this purpose. This form explains the most common possible benefits and the possible risks of treatment with alteplase.

The primary benefit can be improved recovery from stroke. The chance of stroke patients ending up with little or no residual disability can be improved from about 38% without the drug, to about 50% with the drug. However, there is no guarantee that alteplase will help you.

Bleeding into the brain is the major complication of treatment with alteplase, and occurs in about 6 out of 100, of whom 3 will die. The risk of serious bleeding is less than 1 in 100 without the medicine. With or without the treatment, 1 of 5 stroke patients will die in the months following their stroke. Other side effects include nausea, allergic reactions, bleeding, or bruising.

Statement of consent:
I acknowledge that my medical condition and this proposed medication have been explained to my satisfaction, and that all of my questions asked about the medication and its associated risks have been answered in a manner acceptable to me. (If the patient is unable to give consent, a close relative may do so).

☐ I desire to receive alteplase. I accept the risk of substantial and serious harm, if any, in hopes of obtaining the desired beneficial effects of the medication. I understand that admission to the Intensive Care Unit (ICU) will be required for at least 24 hours. In addition, I agree to any invasive procedures and administration of blood products which may be required if serious complications arise, unless specifically revoked in writing by myself or my representative, whom I name below.

☐ I refuse to receive alteplase. I understand that, in doing so, I am refusing an approved, potentially beneficial treatment for acute stroke.

I certify that the time of onset of symptoms of stroke was ____________________.

________________________         __________________________         __________________________
Patient or Relative               Representative                       Printed Name

________________________
MD                            Witness

Date: ____________________  Time: ____________________

(Please indicate if legal documents are available for representative ☐)

IV tPA Consent

MDH6226CC-05 (reviewed 06/08)
# Appendix B - 3: Utah Valley Regional Medical Center Stroke Protocol

**Patient Name:** __________________    **M or F:** __________    **Current Medications:** ____________________________

**Allergies:** ____________________________    **Date:** __________    **Contraindication to IV contrast** □ Yes □ No

<table>
<thead>
<tr>
<th>Goals of Care</th>
<th>Triage, History, Less than 10 minutes</th>
<th>Determination if in origin Less than 10 minutes</th>
<th>Determination if &quot;ISCHEMIC STROKE&quot; Less than 45 minutes from arrival to ED Goal is &quot;door to reperfusion&quot; 60 minutes</th>
</tr>
</thead>
</table>

| Time Line | Triage Time: _________  
Time of onset: _________  
ED Room Time: _________  
ED Doctor in at: _________  
Stroke Team paged: _________  
Neurologist returned call: _________  
Neurologist in ED Time: _________ | Hemorrhagic Stroke? □ Yes □ No  
TIA? □ Yes □ No  
If answer is yes to either of the above then no reperfusion will take place  
Ischemic Stroke? □ Yes □ No  
If yes, time reperfusion decision made _________  
Time IR team called _________  
Time IR team ready _________ |

| CT and Labs | □ CT brain per stroke protocol  
Time of scan _________  
Time scan read _________  
LABS: □ CBC □ CMP □ PT, INR |

| History: □ TIA □ CVA  
Risk Factors: Age: _________  
Wei: _________  
□ Family hx  
□ Dyslipidemia  
□ Hypertension  
□ Stroker  
□ Diabetes  
□ Atrial Fib.  
□ PVD  
□ CAD/prior MI  
□ Oxygen L  
Heart monitor _________  
NIH STROKE SCALE (to be completed by MD) |

| VS and Neuro checks q. 15 minutes | Time: _____ BP _____/_____  
HR _____ Resp _____  
Temp _____ O₂ sat _____  
Neuro check _________  
See monitor sheet for automatically recorded vital signs |

| IV’s | □ IV 18 gauge NS 50 ml/hr Site _________  
2nd IV site NS TKO Site _________  
Other: _________  
Other: _________ |

| Notes | If t-PA (activase) is not given, why? |

**Disposition:** Transfer to a Critical Care Unit (excluding CVU) if t-PA (activase) given:

□ Time transferred _________  
Room # _________  
□ Accepting Nurse _________  
□ Brain Attack Packet sent with patient  
□ Teaching Packet given to patient/family

**Patient Stamp**

**Physician Signature** ____________________________

**Nurse Signature** ____________________________

---

**Acute “STROKE” Flow Sheet/Physician Order**

**Intermountain Urban South Region Emergency Departments**

USRNUR0675-808
Thrombolytic Therapy Checklist for Ischemic Stroke

All of the YES boxes and all of the NO boxes must be checked before thrombolytic therapy can be given (with exception for IA t-PA to the * items below).

Inclusion Criteria (all YES boxes must be checked before treatment):

YES
- Age 18 years or older
- Clinical diagnosis of ischemic stroke causing a measurable neurological deficit (NIH Stroke Scale >4)
- Time of symptom onset well established to be less than 180 minutes before treatment would begin

Exclusion Criteria (all NO boxes must be checked before treatment):

NO
- Evidence of intracranial hemorrhage on noncontrast head CT
- Only minor or rapidly improving stroke symptoms
- High clinical suspicion of subarachnoid hemorrhage even with normal CT
- Active internal bleeding (gastrointestinal bleeding or urinary bleeding within last 21 days)
- Known bleeding diathesis, including but not limited to
  - Platelet count <100,000/mm
  - Patient has received heparin within 48 hours and had an elevated PTT
  - Recent use of anticoagulant (warfarin sodium) and elevated PT >15 sec. or INR >1.7
- Within 3 months of intracranial surgery, serious head trauma, or previous stroke
- Within 14 days of major surgery or serious trauma
- Recent arterial puncture at non-compressible site within 7 days
- Lumbar puncture within 7 days
- History of intracranial hemorrhage, arteriovenous malformation, or aneurysm
- Recent acute myocardial infarction
- On repeated measurements, systolic pressure >185 mm Hg or diastolic pressure >110 mm Hg at time of treatment, requiring aggressive treatment to reduce blood pressure to within these limits
- Serum glucose <50 or >400

IA will be considered in the following cases:

* Recent surgery
* Elevated INR
* 3 to 6 hour time frame
* Posterior circulation (basilar strokes) <24 hours
Physician IV t-PA Order
Conventional IV t-PA Protocol

Physician Orders - to be tubed to pharmacy STAT at station 41
Call pharmacy at 2381 to verify that t-PA (activase) is needed, give patient name and weight

Date:_____________ Time:_____________

Allergies:____________________________________________

Patient’s Weight:____________

☐ Administer t-PA (activase) as follows:
  • Conventional IV t-PA (activase) protocol: 0.9 mg/kg with 90 mg maximum:
    _________ mg.
  • Give as bolus 10% of total calculated dose IV over 1 - 2 minutes using infusion pump: ________ mg.
  • Document time infusion started
  • Infuse remaining dose over 60 minutes using infusion pump: ________ mg.

MD Signature:________________________ Date:__________

UVMD2291-4/06
INFORMED CONSENT FOR ADMINISTRATION OF ACTIVASE (t-PA)
FOR ACUTE ISCHEMIC STROKE

You (or your relative) have a stroke caused by blockage of an artery to the brain by a blood clot. Many patients become more seriously ill immediately after the stroke, even with state-of-the-art treatment. Of those who survive, most patients will have some degree of permanent disability.

You (or your relative) might benefit from a drug given by vein, called Activase (t-PA), that dissolves blood clots. This drug is approved by the Food and Drug Administration (FDA) for this purpose. We want you to know about the possible benefits and the possible risks of treatment with Activase.

The primary benefit is improved recovery from stroke. The chance of stroke patients ending up with little or no residual disability can be improved from about 38% without the drug, to about 50% with the drug. However, there is no guarantee that Activase will help you.

Bleeding into the brain is the major complication of treatment with Activase, and occurs in about 6 out of 100, of whom 3 will die. The risk of serious bleeding is less than 1 in 100 without the medicine. With or without the treatment, 1 of 5 stroke patients will die in the months following their stroke. Other complications of the medicine can be nausea, allergic reactions, bleeding, or bruising.

Statement of consent:
I acknowledge that my medical condition and the proposed medication has been explained to my satisfaction, and that all of my questions asked about the medication and it’s attendant risks have been answered in a manner acceptable to me. (If the patient is unable to give consent, a close relative may do so).

☐ I desire to receive Activase. I accept the risk of substantial and serious harm, if any, in hopes of obtaining the desired beneficial effects of the medication.

☐ I refuse to receive Activase. I understand that, in doing so, I am refusing the only approved treatment for acute stroke.

I certify that the time of onset of symptoms of stroke was _______________.

_________________________    ___________________________
Patient or Relative                 Date

_________________________    ___________________________
Doctor                          Witness

USRMRF0013-4/06
 Samples of Protocols

Appendix B - 3: Utah Valley Regional Medical Center Stroke Protocol

PHYSICIAN’S ORDERS

1. Admit to ICU

2. Diagnosis: Ischemic Stroke

3. Vital signs and neuro checks: q 15 min. for 2 hrs post t-PA, q 30 min. X 6 hrs., q 1 hr X 16 hrs.
   Call MD if any neurological changes

4. Respiratory: □ Oxygen by nasal cannula at 2L prn to keep O2 sats > 92% □ Incentive Spirometry

5. Allergies:

6. Medications: (No Heparin, Coumadin, Plavix, Aggseax or Aspirin for 24 hours after treatment)

7. BP management: Goal is to maintain a systolic less than 180 mm Hg and/or diastolic less than 105
   for systolic 180-230 mm Hg and/or diastolic 106-140 mm Hg or mean arterial
   greater than or equal to 130 mm Hg, institute IV labetolol, esmolol, enalapril
   □ Labetolol 10-40 mg IV q 10 min. for maximum of 100 mg/hr to maintain BP parameters
   □ Labetolol continuous drip (2-8 mg/min) to maintain BP parameters
   □ Cardene (nicardipine) start with 5 mg/hr IV continuous infusion, titrate up to 15 mg/hr to maintain BP parameters
   □ Brevibloc (esmolol) 500 mcg/kg IV as a load, maintenance use 50-200 mcg/kg/min IV
   □ Hydralazine 10-20 mg IV bolus q 4 hours PRN to maintain BP parameters
   □ Vasotec (enalapril) 0.625-1.25 mg iv q 6 hours PRN to maintain BP parameters
   for systolic greater than 230 mm Hg and/or diastolic greater than 140 mm Hg on 2 readings 5 min. apart, start Nipride.
   □ Nipride (nitroprusside) 0.5-8 mcg/kg/min IV titrated to maintain BP parameters

8. IV: NS at ___________ mL/hr or

9. Diet: NPO until swallow evaluation is performed (no NG tube placement for 24 hours)
   □ Nursing swallow screen on admit

10. Blood Glucose: □ glucometer checks q ______ hrs □ Consult Diabetes Management Team

11. Activity: □ Bedrest with HOB at 30 degrees □ Other_________________________

12. Precautions: aspiration, seizure, falls, bleeding (evaluate urine, stool, emesis or other secretions for blood)

13. DVT Prophylaxis:
   □ Sequential Compression Device □ Other_________________________

14. GI Prophylaxis:
   □ Pepcid 20mg PO q 12 hours if able to swallow, IV if not
   □ Pepcid 20mg daily if creatinine higher than 2.0 mg/dL
   □ Protonix 40mg PO daily if able to swallow or IV if not

15. Labs: Labs on admission: □ CBC □ CMP □ PT/INR □ CK □ Troponin
   Labs in the am (for next day only): □ CBC □ CMP □ PT/INR □ Drug Screen □ Fasting Lipoprotein
   □ Fasting lipid panel □ Fasting Homocysteine □ C reactive protein □ ESR □ ANA □ A1C

16. Diagnostic tests: □ MRI brain □ MRA (Head & Neck) □ TEE □ TTE □ CXR □ Apnea link
   □ EkG □ 4 Vessel Cerebral Angiogram

17. Consults:
   □ Swallow evaluation □ Cardiology □ Neurology
   □ Rehab evaluation (Dr. Hulmo) □ Occupational Therapy
   □ Physical Therapy □ Speech Therapy

18. Education: □ Stroke Education □ Smoking Cessation
   □ Risk Factors_________________________

19. Code Status: □ Full □ DNR

Date: ____________________________  M.D. Signature ____________________________

Intermountain
Urban South Region
Ischemic Stroke
Post Treatment Orders

USR2209 11/08
The following four pages consist of mixing directions for t-PA treatment (recombinant tissue plasminogen activator known as Activase or Alteplase). The directions can be kept separately in a location designated for t-PA mixing. Please read all directions before mixing or using t-PA.
### Activase (t-PA) Dosing Regimen for Acute Ischemic Stroke

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<th>Weight (kg)</th>
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<th>Infusion Dose (&gt;60 min) (mg/mL)</th>
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**Using Activase (t-PA)**

Activase treatment (t-PA) should only be initiated within 3 hours after the onset of stroke symptoms, and after exclusion of intracranial hemorrhage by a cranial computerized tomography (CT) scan or other diagnostic imaging method sensitive for the presence of hemorrhage.

The total dose of Activase for treatment of Acute Ischemic Stroke should NOT exceed 90 mg.

The recommended dose of Activase for acute ischemic stroke is 0.9 mg/kg (maximum 90 mg) infused over 60 minutes, with 10% of the total dose administered as an initial intravenous bolus over 1 minute.

### Patient Follow-Up

- Monitor vital signs and neurological status
- Maintain blood pressure ≤185/≤110 mmHg
- No anticoagulant or antiplatelet therapy for 24 hours following symptom onset
- Before anticoagulant or antiplatelet therapy is started, a follow-up CT scan should show no evidence of hemorrhage
- Pay special attention to potential bleeding sites (eg, catheter insertion site)
Contraindications of Using Activase (t-PA)
Activase therapy in patients with acute ischemic stroke is contraindicated in the following situations because of an increased risk of bleeding, which could result in significant disability or death:

- Evidence of intracranial hemorrhage on pretreatment evaluation
- Suspicion of subarachnoid hemorrhage on pretreatment evaluation
- Recent (within 3 months) intracranial or intraspinal surgery, serious head trauma, or previous stroke
- History of intracranial hemorrhage
- Uncontrolled hypertension at time of treatment (eg, >185 mmHg systolic or >110 mmHg diastolic)
- Seizure at the onset of stroke
- Active internal bleeding
- Intracranial neoplasm, arteriovenous malformation, or aneurysm
- Known bleeding diathesis, including but not limited to:
  - Current use of oral anticoagulants or an International Normalized Ratio (INR) >1.7 or a prothrombin time (PT) >15 seconds
  - Administration of heparin within 48 hours preceding the onset of stroke and an elevated activated partial thromboplastin time (aPTT) at presentation
  - Platelet count <100,000/mm³

Following Activase Administration
The most common complication during t-PA (recombinant tissue plasminogen activator known as Activase or Alteplase) therapy is bleeding. There are 2 broad categories of bleeding: internal bleeding, involving intracranial and retroperitoneal sites, or the gastrointestinal, genitourinary, or respiratory tracts; and superficial or surface bleeding, which is mainly observed at invaded or disturbed sites such as arterial punctures or sites of recent surgery. Should bleeding occur that cannot be controlled by local pressure, the infusion of Activase and any concomitant heparin should be discontinued immediately.
**Activase (t-PA) Dosing**

The recommended dose is 0.9 mg/kg (not to exceed 90 mg total dose) infused over 60 minutes with 10% of the total dose administered as an initial intravenous bolus over 1 minute. Activase (recombinant tissue plasminogen activator known as t-PA or Alteplase) should be reconstituted only with Sterile Water for Injection, USP (SWFI), without preservatives. Do not use Bacteriostatic Water for Infection, USP. Since Activase contains no antibacterial preservatives, it should be reconstituted immediately before use. The solution may be used for intravenous administration within 8 hours following reconstitution when stored between 2 and 30°C (36-86°F). The reconstituted preparation results in a colorless to pale yellow transparent solution containing Activase 1 mg/mL. Use aseptic technique throughout.

**Reconstitution of 100-mg Vials**
(Reconstitution should be carried out using the transfer device provided. 100-MG VIALS DO NOT CONTAIN VACUUM.)

1. Remove the protective cap from one end of the transfer device and, keeping the vial of SWFI upright, insert the piercing pin vertically into the center of the stopper of the vial of SWFI.
2. Remove the protective cap from the other end of the transfer device. DO NOT INVERT THE VIAL OF SWFI.
3. Holding the vial of Activase upside-down, position it so that the center of the stopper is directly over the exposed piercing pin of the transfer device.
4. Push the vial of Activase down so that the piercing pin is inserted through the center of the Activase vial stopper.
5. Invert the 2 vials so that the vial of Activase is on the bottom (upright) and the vial of SWFI is upside-down, allowing the SWFI to flow down through the transfer device. Allow the entire contents of the vial of SWFI to flow into the Activase vial (approximately 0.5 mL of SWFI will remain in the diluents vial). Approximately 2 minutes are required for this procedure.
6. Remove the transfer device and the empty SWFI vial from the Activase vial. Safely discard both the transfer device and the empty diluents vial according to institutional procedures.
7. Swirl gently between palms to dissolve the Activase powder. DO NOT SHAKE. No other medication should be added to infusion solutions containing Activase. Any unused infusion solution should be discarded.
Reconstitution of 50-mg Vials
1. Withdraw 50 mL of SWFI. Diluent is included. DO NOT USE Bacteriostatic Water for Injection, USP.
2. Inject the 50 mL of SWFI into the 50-mg Activase vial, using a large bore needle (eg, 18-gauge) and a syringe, directing the stream into the lyophilized cake. DO NOT USE IF VACUUM IS NOT PRESENT. If slight foaming occurs, let the vial stand undisturbed for several minutes to allow large bubbles to dissipate.
3. Swirl gently between palms to dissolve the Activase powder. DO NOT SHAKE. No other medications should be added to infusion solutions containing Activase.

Administering the Bolus Dose of Activase (t-PA)
1. Inspect solution for particulate matter and discoloration prior to administration.
2. Withdraw 10% of the 0.9-mg/kg dose in one of the following ways:
   a. By removing the appropriate volume from the vial of reconstituted (1 mg/mL) Activase (recombinant tissue plasminogen activator known as t-PA or Alteplase) using a syringe and needle. If this method is used with the 50-mg vials, the syringe should not be primed with air and the needle should be inserted into the Activase vial stopper. If the 100-mg vial is used, the needle should be inserted away from the puncture mark made by the transfer device.
   b. By removing the appropriate volume from a port (second injection site) on the infusion line after the infusion set is primed.
   c. By programming an infusion pump to deliver the appropriate volume as a bolus at the initiation of the infusion.
3. Administer as an initial intravenous bolus over 1 minute.

Administering the Remainder of the Activase (t-PA) Dose
Infuse the remaining 90% of the 0.9-mg/kg dose over 60 minutes.
• 50-mg Vials: Administer using either a polyvinyl chloride bag or glass vial and infusion set.
• 100-mg Vials: Remove from the vial any quantity of drug in excess of that specified for patient treatment. Re-label the vial for reuse. Insert the spike end of an infusion set through the same puncture site created by the transfer
device in the stopper of the vial of reconstituted Activase. Hang the Activase vial from the plastic molded capping attached to the bottom of the vial.

- Make sure all of drug is used, including any drug left in the tubing.
<table>
<thead>
<tr>
<th>Hospital Name:</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td></td>
</tr>
<tr>
<td>Person Completing this Application:</td>
<td>Phone Number</td>
</tr>
<tr>
<td></td>
<td>Email Address</td>
</tr>
<tr>
<td>Number ofLicensed Beds</td>
<td></td>
</tr>
</tbody>
</table>

THE RESPONSES TO THESE QUESTIONS AND ALL SUBMITTED DATA WILL BE USED FOR EXCLUSIVELY FOR STATE DESIGNATION AND PERFORMANCE IMPROVEMENT PURPOSES PLEASE RESPOND AS ACCURATELY AS POSSIBLE

If you need information about how to respond to a question, please e-mail Robert F. Jex, rfjex@utah.gov or call 801.201.6074.
# Utah Stroke Receiving Facility Application

## Appendix D

### For Department Use Only

<table>
<thead>
<tr>
<th>Emergency Department Staffing</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the Emergency Department Staffed with an RN 24/7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is the Emergency Department staffed with an physician 24/7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. If the Emergency Department is not staffed with a physician 24/7:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is there a requirement that a physician respond in 30 minutes or less?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is the RN authorized to initiate stroke protocol?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Is the Emergency Department staff trained in the use of a standardized assessment too for stroke severity?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What assessment tool are they trained in:

<table>
<thead>
<tr>
<th>5. Does the Hospital use a standardize acute ischemic stroke protocol? Please include a copy of the protocol used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Is ACTIVASE OR rt-PA stocked in hospital?</td>
</tr>
<tr>
<td>7. Does the hospital staff have access to a standardized “Stroke Box”? Please attach a list of the contents and location</td>
</tr>
</tbody>
</table>

### Transfer and Transport Protocol

<table>
<thead>
<tr>
<th>8. Does the hospital have a transport protocol with contingency plans for bad weather, no bed availability, etc?</th>
</tr>
</thead>
</table>

**Please attach a copy of that protocol**

### Stroke Care and Treatment

<table>
<thead>
<tr>
<th>5. Does the hospital have telestroke capabilities with a stroke center (i.e. University of Utah)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. If no telestroke capabilities exists, is there a physician readily available trained to treat acute ischemic stroke? Name of trained physician:</td>
</tr>
</tbody>
</table>

### CT Availability

<table>
<thead>
<tr>
<th>5. Does the hospital have CT availability 24/7?</th>
</tr>
</thead>
</table>
- Are completed CT images able to be interpreted immediately by a radiologist, neurologist or neurosurgeon

<table>
<thead>
<tr>
<th>Laboratory Availability</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Is the hospital laboratory staff 24/7?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Are the following test results available within 45 minutes of patient arrival:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBC</td>
</tr>
<tr>
<td>BMP</td>
</tr>
<tr>
<td>PT/PTT/INR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality Improvement Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Does the hospital collect and review standard stroke quality improvement data? Please attach a copy of data elements</td>
</tr>
<tr>
<td>12. Will the hospital collect and report quality improvement data to the DOH Stroke Program on a quarterly basis?</td>
</tr>
<tr>
<td>13. Will the hospital participate in stroke specific training offered or approved by the Utah Department of Health?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attachment Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following items should be returned as attachments to this application:</td>
</tr>
<tr>
<td>Stroke Physician Call Roster</td>
</tr>
<tr>
<td>Stroke Assessment Tool</td>
</tr>
<tr>
<td>Activase or r-tPA Protocol</td>
</tr>
<tr>
<td>Acute Ischemic Stroke Protocol</td>
</tr>
<tr>
<td>Stroke Box Contents and Location</td>
</tr>
<tr>
<td>Stroke Inter Hospital Transfer/Transport Protocol</td>
</tr>
<tr>
<td>Applicable Transfer Agreements</td>
</tr>
<tr>
<td>Stroke Quality Data Form</td>
</tr>
</tbody>
</table>

If you have any questions concerning this application, please contact Robert F. Jex, RN, MHA, FACHE at rfjex@utah.gov, or 801.201.6074.
# Primary Stroke Centers are highlighted in darker red.

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Phone Number</th>
<th>Address</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen Memorial Hospital</td>
<td>435.259.7191</td>
<td>P.O. Box 998</td>
<td><a href="http://www.amhmoab.org">www.amhmoab.org</a></td>
</tr>
<tr>
<td></td>
<td>435.259.5172 (f)</td>
<td>719 W 400 N Moab, UT 84532</td>
<td></td>
</tr>
<tr>
<td>Alta View Hospital</td>
<td>801.501.2600</td>
<td>9660 S 1300 E Sandy, UT 84094</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>American Fork Hospital</td>
<td>801.855.3300</td>
<td>170 N 1100 E American Fork, UT 84003</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Ashley Regional Medical Center</td>
<td>435.789.3342</td>
<td>151 W 200 N Vernal, UT 84078</td>
<td><a href="http://www.avmc-hospital.com">www.avmc-hospital.com</a></td>
</tr>
<tr>
<td>Bear River Valley Hospital</td>
<td>435.207.4500</td>
<td>905 N 1000 W Tremonton, UT 84337</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Beaver Valley Hospital</td>
<td>435.438.7100</td>
<td>P.O. Box 1670 1109 N 100 W Beaver, UT 84713</td>
<td><a href="http://www.beaverutah.net/hospital.htm">www.beaverutah.net/hospital.htm</a></td>
</tr>
<tr>
<td>Brigham City Community Hospital</td>
<td>435.734.4200</td>
<td>950 S. Medical Dr. Brigham City, UT 84302</td>
<td><a href="http://www.brimhamcityhospital.com">www.brimhamcityhospital.com</a></td>
</tr>
<tr>
<td>Cache Valley Specialty Hospital</td>
<td>435.713.9700</td>
<td>2380 N 400 E North Logan, UT 84341</td>
<td><a href="http://www.cvsh.com">www.cvsh.com</a></td>
</tr>
<tr>
<td>Castleview Hospital</td>
<td>435.637.4800</td>
<td>P.O. Box 412 48 W 1500 N Price, UT 84501</td>
<td><a href="http://www.castleviewhospital.net">www.castleviewhospital.net</a></td>
</tr>
<tr>
<td>Center for Change, Inc.</td>
<td>801.224.8255</td>
<td>1790 N. State St. Orem, UT 84057</td>
<td><a href="http://www.centerforchange.com">www.centerforchange.com</a></td>
</tr>
<tr>
<td>Central Valley Medical Center</td>
<td>435.623.3000</td>
<td>P.O. Box 412 48 W 1500 N Nephi, UT 84648</td>
<td><a href="http://www.centralvalleymed.com">www.centralvalleymed.com</a></td>
</tr>
<tr>
<td>Copper Hills Youth Center</td>
<td>801.561.3377</td>
<td>5899 W. Rivendell Dr. West Jordan, UT 84088</td>
<td><a href="http://www.copperhills_youthcenter.com">www.copperhills_youthcenter.com</a></td>
</tr>
<tr>
<td>Davis Hospital and Medical Center</td>
<td>801.807.1000</td>
<td>1600 W. Antelope Dr. Layton, UT 84041</td>
<td><a href="http://www.davishospital.com">www.davishospital.com</a></td>
</tr>
<tr>
<td>Delta Community Medical Center</td>
<td>435.864.5591</td>
<td>126 S. White Sage Ave. Delta, UT 84624</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td></td>
<td>435.864.4186 (f)</td>
<td></td>
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<tr>
<td>Dixie Regional Medical Center</td>
<td>435.688.4000</td>
<td>544 S 400 E St. George, UT 84770</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
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<tr>
<td></td>
<td>435.688.4002 (f)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dixie Regional Medical Center- River Road</td>
<td>435.251.1000</td>
<td>1380 E. Medical Dr. St. George, UT 84790</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
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<tr>
<td></td>
<td>435.251.2115 (f)</td>
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<tr>
<td>Fillmore Community Medical Center</td>
<td>435.743.5591</td>
<td>374 S. Highway 99 Fillmore, UT 84631</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td></td>
<td>435.743.6312 (f)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garfield Memorial Hospital</td>
<td>435.676.8811</td>
<td>P.O. Box 389 200 N 400 E Panguitch, UT 84759</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td></td>
<td>435.676.2679 (f)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Name</td>
<td>Phone Number</td>
<td>Address</td>
<td>Website</td>
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<td>--------------------------------</td>
</tr>
<tr>
<td>Gunnison Valley Hospital</td>
<td>435.528.7246, 435.528.2197 (f)</td>
<td>P.O. Box 759, 64 E 100 N Gunnison, UT 84634</td>
<td>n/a</td>
</tr>
<tr>
<td>Health South Rehab/ Specialty Hospital of Utah</td>
<td>801.561.3400, 801.565.6576 (f)</td>
<td>8074 S 1300 E Sandy, UT 84094</td>
<td><a href="http://www.healthsouth.com">www.healthsouth.com</a></td>
</tr>
<tr>
<td>Heber Valley Medical Center</td>
<td>435.654.2500, 435.654.2576 (f)</td>
<td>1485 S. Highway 40 Heber City, UT 80432</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Highland Ridge Hospital</td>
<td>801.569.2153, 801.537.9006 (f)</td>
<td>7309 S 180 W Midvale, UT 84047</td>
<td><a href="http://www.highlandridgehospital.com">www.highlandridgehospital.com</a></td>
</tr>
<tr>
<td>Huntsman Cancer Institute</td>
<td>801.587.7000, 801.587.4030 (f)</td>
<td>1950 Circle of Hope Dr. SLC, UT 84112</td>
<td><a href="http://huntsmancancer.org">http://huntsmancancer.org</a></td>
</tr>
<tr>
<td>Intermountain Medical Center</td>
<td>801.507.7000</td>
<td>5121 S. Cottonwood St. Murray, UT 84107</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Jordan Valley Medical Center</td>
<td>801.561.8888, 801.569.8723 (f)</td>
<td>3580 W 9000 S West Jordan, UT 84088</td>
<td><a href="http://www.jordanvalleyhospital.com">www.jordanvalleyhospital.com</a></td>
</tr>
<tr>
<td>Kane County Hospital</td>
<td>435.644.5811, 435.644.4141 (f)</td>
<td>355 N. Main St. Kanab, UT 84741</td>
<td>n/a</td>
</tr>
<tr>
<td>Lakeview Hospital</td>
<td>801.299.2200, 801.299.2511 (f)</td>
<td>630 E. Medical Dr. Bountiful, UT 84010</td>
<td><a href="http://www.lakeviewhospital.com">www.lakeviewhospital.com</a></td>
</tr>
<tr>
<td>LDS Hospital</td>
<td>801.408.1100, 801.408.1665 (f)</td>
<td>8th Ave &amp; “C” Street SLC, UT 84143</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Logan Regional Hospital</td>
<td>435.716.1000, 435.716.5409 (f)</td>
<td>1400 N 500 E Logan, UT 84341</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Mc-Kay Dee Hospital Center</td>
<td>801.627.2800, 801.387.3725 (f)</td>
<td>4401 Harrison Blvd. Ogden, UT 84403</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Milford Valley Memorial Hospital</td>
<td>435.387.2411, 435.387.5011 (f)</td>
<td>P.O. Box 640, 451 N. Main St. Milford, UT 84751</td>
<td>n/a</td>
</tr>
<tr>
<td>Mountain View Hospital</td>
<td>801.465.7000, 801.465.7170 (f)</td>
<td>1000 E 100 N Payson, UT 84651</td>
<td><a href="http://www.mvhpayson.com">www.mvhpayson.com</a></td>
</tr>
<tr>
<td>Mountain West Medical Center</td>
<td>435.843.3600, 435.882.8770 (f)</td>
<td>2055 N. Main St. Tooele, UT 80474</td>
<td><a href="http://www.mountainwestmc.com">www.mountainwestmc.com</a></td>
</tr>
<tr>
<td>Ogden Regional Medical Center</td>
<td>801.479.2111, 801.479.2091 (f)</td>
<td>5475 S 500 E Ogden, UT 84405</td>
<td><a href="http://www.ogdenregional.com">www.ogdenregional.com</a></td>
</tr>
<tr>
<td>Orem Community Hospital</td>
<td>801.224.4080, 801.226.7831 (f)</td>
<td>331 N 400 W Orem, UT 84057</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Park City Medical Center</td>
<td>435.658.7000</td>
<td>900 Round Valley Dr. Park City, UT 84060</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Pioneer Valley Hospital</td>
<td>801.964.3100, 801.964.3247 (f)</td>
<td>3460 S. Pioneer Pkwy. West Valley City, UT 84120</td>
<td><a href="http://www.pionervalleymhospital.com">www.pionervalleymhospital.com</a></td>
</tr>
<tr>
<td>Primary Children’s Medical Center</td>
<td>801.588.2000, 801.588.2318 (f)</td>
<td>100 N. Medical Dr. SLC, UT 84113</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Promise Specialty Hospital of SL</td>
<td>801.350.4110</td>
<td>1050 E. South Temple SLC, UT 84102</td>
<td><a href="http://www.promisehealthcare.com/regional_map.asp?state=utah">www.promisehealthcare.com/regional_map.asp?state=utah</a></td>
</tr>
<tr>
<td>Hospital Name</td>
<td>Phone Number</td>
<td>Address</td>
<td>Website</td>
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<td>----------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>San Juan Hospital/</td>
<td>435.587.2116</td>
<td>P.O. Box 308</td>
<td>n/a</td>
</tr>
<tr>
<td>Health Services</td>
<td>435.587.2061 (f)</td>
<td>364 W 100 N Monticello, UT 84535</td>
<td></td>
</tr>
<tr>
<td>Sanpete Valley Hospital</td>
<td>435.462.2441</td>
<td>1100 S. Medical Dr. Mt. Pleasant, UT 84647</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Sevier Valley Medical Center</td>
<td>435.896.8271</td>
<td>1000 N. Main St. Richfield, UT 84701</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Shriners Hospital for</td>
<td>801.536.3500</td>
<td>Fairfax Rd. at Virginia St. SLC, UT 84103</td>
<td><a href="http://www.shrinersh.org/Hospitals/Salt_Lake_City/">http://www.shrinersh.org/Hospitals/Salt_Lake_City/</a></td>
</tr>
<tr>
<td>Children, Intermountain</td>
<td>801.536.3799 (f)</td>
<td></td>
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</tr>
<tr>
<td>South Davis Community Hospital</td>
<td>801.295.2361</td>
<td>401 S 400 E Bountiful, UT 84010</td>
<td><a href="http://www.sdch.com">www.sdch.com</a></td>
</tr>
<tr>
<td>St. Mark's Hospital</td>
<td>801.268.7111</td>
<td>1200 E 3900 S SLC, UT 84124</td>
<td><a href="http://www.stmarkhospital.com">www.stmarkhospital.com</a></td>
</tr>
<tr>
<td>The Orthopedic Specialty Hospital</td>
<td>801.314.4100</td>
<td>5848 S 300 E Murray, UT 84107</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
</tr>
<tr>
<td>Timpanogos Regional Hospital</td>
<td>801.714.6570</td>
<td>750 W 800 N Orem, UT 84057</td>
<td><a href="http://www.timpanogosregionalhospital.com">www.timpanogosregionalhospital.com</a></td>
</tr>
<tr>
<td>801.714.6597 (f)</td>
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<td></td>
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<tr>
<td>Uintah Basin Medical Center</td>
<td>435.722.4691</td>
<td>250 W 300 N Roosevelt, UT 84066</td>
<td><a href="http://www.ubmc.org">www.ubmc.org</a></td>
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<td>435.722.9291 (f)</td>
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<td>University of Utah Medical Center</td>
<td>801.581.2121</td>
<td>50 N. Medical Dr. SLC, UT 84132</td>
<td><a href="http://uuhsc.utah.edu">http://uuhsc.utah.edu</a></td>
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<td>801.585.5280 (f)</td>
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<td>University Neuropsychiatric Institute</td>
<td>801.583.2500</td>
<td>501 Chipeta Way SLC, UT 84108</td>
<td><a href="http://uuhsc.utah.edu/university">http://uuhsc.utah.edu/university</a></td>
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<tr>
<td>801.582.8471 (f)</td>
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<td>Utah State Hospital</td>
<td>801.344.4400</td>
<td>P. O. Box 270</td>
<td><a href="http://www.hsush.state.ut.us">www.hsush.state.ut.us</a></td>
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<tr>
<td>801.344.4225 (f)</td>
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<td>1300 E. Center St. Provo, UT 84603</td>
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<td>Utah Valley Regional Medical Center</td>
<td>801.357.7850</td>
<td>1034 N 500 W Provo, UT 84604</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
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<td>801.357.7780 (f)</td>
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<td>Utah Valley Specialty Hospital</td>
<td>801.226.8880</td>
<td>306 W. River Bend Ln. Provo, UT 84604</td>
<td><a href="http://uvsh.ernesthealth.com">http://uvsh.ernesthealth.com</a></td>
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<td>801.226.5755 (f)</td>
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<td>VA SLC Health Care System</td>
<td>801.582.1565</td>
<td>500 Foothill Blvd. SLC, UT 84148</td>
<td><a href="http://www.va.gov/visn19/slc.htm">www.va.gov/visn19/slc.htm</a></td>
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<td>Valley View Medical Center</td>
<td>435.868.5000</td>
<td>1303 N. Main St. Cedar City, UT 84720</td>
<td><a href="http://intermountainhealthcare.org">http://intermountainhealthcare.org</a></td>
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<td>435.868.5803 (f)</td>
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