Reference Guide: 
Acute Stroke Ready Hospital (ASRH) Designation

MINNESOTA STROKE PROGRAM

11/6/2019
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Welcome!

We are pleased that your facility has decided to apply for initial designation or re-designation as an Acute Stroke Ready Hospital (ASRH)! This resource is your all-in-one guide to organizing everything you need for the designation application process. The designation application is comprised of two components: the electronic submission of documents for each criteria in the Minnesota Stroke Portal, and the one-day site visit facilitated by the Minnesota Department of Health (MDH) review team. Both components are combined together to approve or deny designation.

This guide includes overview of the requirements, specifics about what to submit, an Appendix full of samples to reference, and what to expect at the site visit for validation of each criteria.

The Stroke System Designation Coordinator will be contacting you to schedule your hospitals site visit PRIOR to application deadline. The site visit will typically occur prior to the designation effective date (July 1 or January 1).

If you have questions or need clarification about any of the following criteria and supplemental documentation that you will be asked to submit as part of your ASRH designation application, please contact the Minnesota Stroke Program by email at health.stroke@state.mn.us.

Tips for Successfully Submitting your Application in the Minnesota Stroke Portal

Please pay particular attention to the following documentation details asked of you for each submission requirement. This will benefit you and the Minnesota Department of Health (MDH) greatly by making the process much more efficient. Be mindful of the deadline for submission (April 1 or October 1) and upload a thorough, thoughtful, and complete application!

Getting Started

- Please use the checklist at the end of this document when organizing your documents for submission: Acute Stroke Ready Hospital Designation Checklist
- A video tutorial with step-by-step instructions for application submission is also available on the mnhealth Stroke Program YouTube Channel.
- After you sign in to the Portal, the Designation section is located at the top menu banner from the homepage. Click on New Application. Select your facility and designation level (MDH Acute Stroke Ready Hospital).
- At any point in time if you need any clinical or technical support, please contact the MDH Stroke Program at health.stroke@state.mn.us
Updating Application Sections

- **Contacts**
  - Update the *Contacts* section in your application. If primary or secondary contacts need further updating, please contact the MDH Stroke Program at health.stroke@state.mn.us. All fields with an asterisk (*) must be completed. To save, click **Update**.
  - **CEO** - The administrative leader at your facility. Titles may vary.
  - **Primary Contact** - The on-site designated stroke coordinator. This person manages the workload of the stroke program. This role, in collaboration with the stroke medical director, comprises the Stroke Program Leadership Team.
  - **Secondary Contact** - The designated program staff member that supports the stroke program and would be point of contact in the absence of the primary contact. (i.e., DON, quality department, ED nursing director)
  - **Stroke Medical Director** - The on-site physician (or mid-level professional) that has experience in acute stroke care and provides medical leadership for the stroke program.
  - **Registry/Data Entry** - The staff member who submits data to the Minnesota Stroke Registry for your hospital.

- **Facility**
  - Update Facility section by entering the name of the facility you are applying for. Important to note - this is the name that will appear on the certificate we will send you once your application has been approved. To save, click **Update**.

- **Stroke Program Summary**
  - Update Stroke Program Summary section by entering your Stroke Program Narrative. This section provides you with an opportunity to describe your program and please include the following components at a minimum: To save, click **Update**.
  - Which EMS agencies deliver and how you collaborate with EMS
  - Who can activate your Acute Stroke Team (AST), how it is activated (i.e., overhead page, etc.) and who logs this on the activation Log
  - How your acute stroke protocol is implemented: describe what happens when you activate
  - How and where you transfer your patients, and whether you keep alteplase patients
  - How you address staff education
  - How you utilize your activation log to conduct data collection and performance improvement
Who are the key providers and staff involved in your program and in the care of stroke patients

**Uploading Documents**

- All attachments must be in **PDF format**.
- Once an attachment is successfully uploaded, it is saved into your application.
- Name files with short titles that are pertinent to the document you are submitting.
- Eliminate pages of unnecessary documentation by uploading only the documents, or sections of documents, that are necessary to illustrate the required criteria.
- Ensure uploads are easy to read (i.e., **not** upside down, **not** vertical layout when should be horizontal, legible, etc.)
- Ensure all documentation (e.g., protocols, policies, order sets, agreements, letters, etc.) are up-to-date and are signed.
- Your CEO **must** sign the CEO Attestation Letter. The template is available for download. Please print the document on your hospital letterhead, obtain the CEO’s signature, and upload to complete required documentation.

If you are unsure or need clarification on required documentation – please contact MDH Stroke Program staff at health.stroke@state.mn.us

**Submitting the Application**

- Once all required documentation has been updated and uploaded, the number next to the title of each section will be zero and the circles will have changed from red to green.

To submit your completed application click on **Submit Application**.

- A message will appear at the top of the screen stating the application was submitted successfully. The status of your application will change from In progress to Submitted.
- An automated email from health.stroke@state.mn.us will be sent to you verifying application submission.
What to Expect after Submission

- **Step 1: SUBMITTED** - Internal MDH review of your electronic application. We will follow up with you as needed.
- **Step 2: IN REVIEW** - ASRH Application Review Committee completes clinical review of your application. Site visit conducted by clinical stroke expert and MDH staff (MDH review team) to verify that submitted documents coincide with clinical practice.
- **Step 3: PENDING APPROVAL** - ASRH Designation Report is formulated from the application review committee and the on-site visit which includes identified areas of feedback in the following categories: Immediate Actions, Recommendations, Opportunities for Improvement, and Strengths.
- **Step 4: APPROVED** - Notification of designation status, including emailed copy of the ASRH Designation Report and copy of the signed ASRH designation certificate. Original ASRH designation certificate will be mailed to your facility (addressed to CEO).
- Mid-cycle conference call (approximately one year post application approval)

The Minnesota Department of Health Stroke Program will conduct a mid-cycle conference call with all hospitals whom received Acute Stroke Ready Hospital (ASRH) designation status once in their 3 year designation cycle. This process is to ensure the monitoring of immediate action plans as submitted and recommendations as outlined in the ASRH Designation Report.
Designation Criteria and Required Documentation

Criteria 1 - ACUTE STROKE TEAM LOG

Activation Log is evidence of an Acute Stroke Team (AST) available 24 hours a day, 7 days a week.

Rationale:

An acute stroke team (AST) is a key component of an Acute Stroke Ready Hospital. Studies have shown the importance of such a response team to provide organized care in a safe and efficient manner. The presence of an AST is an independent predictor of the ability to administer intravenous thrombolytic therapy (IV alteplase) and improve the outcomes of stroke patients.

The AST includes all nurses and providers that respond to stroke, at a minimum, one nurse and one provider. The AST may be staffed by a variety of healthcare personnel depending on the resources available at a particular facility. Note, the AST may also include telestroke provider, laboratory, radiology, pharmacy, and other departments and should be defined by the ASRH. Hospitals not staffed with an emergency department physician may assign a licensed independent practitioner (LIP) instead of a physician. Members of the AST should be available and/or on-call 24 hours a day, 7 days a week. Your stroke protocol (to be submitted in #2) must detail the roles of this Acute Stroke Team.

- Implementing an acute stroke team activation log is required. The stroke coordinator should reference the AST log regularly in order evaluate the stroke team activation process. You should record all stroke team activations regardless of final clinical diagnosis. This will enable your program to thoroughly evaluate the entire code process and identify any delays in care or areas for improvement.

What do I need to submit?

- Acute Stroke Team Activation Log that includes at a minimum the following: date and time of activation, response time to bedside, final admitting diagnosis in the ED, treatments and discharge disposition (admit, discharge, transfer). The log illustrates the use and implementation of an Acute Stroke Team. Please note: more than one log may be used for tracking of cases (for example, an activation log combined with PI log). If there is a combination of documents, please submit both for review. Please submit the last twelve months of logged cases. We require tracking of all stroke code activations.

What do I need to for the site visit?

- The site review team will ask to see your log and want to have an active discussion as to how it is utilized.

Example: Appendix A: Sample Acute Stroke Team Activation Log
Criteria 2 - WRITTEN PROTOCOLS

Written stroke protocols and algorithms for acute treatment in the Emergency Department.

Rationale:

An ASRH should be able to deliver initial acute therapies that can improve outcomes for patients with a variety of strokes. In addition, the stroke-ready hospital should have an organized set of protocols to address various clinical presentation and complications which may arise in acute stroke patients. A written protocol is essential to ensure that all stroke patients receive organized care in a safe and efficient manner. A written protocol also ensures that important care elements are not omitted, and that prohibited medications or treatments are not administered.

- This protocol should encompass care in the ED. If you have a protocol that addresses acute neurological changes or inpatient stroke code activation, please submit that as well. Protocols should be developed by a multidisciplinary team and reviewed and revised to reflect changes in medical knowledge, care standards, and guidelines. Most hospitals review their policies on a scheduled timeframe for example every 1 to 3 years. We recommend that policies are reviewed and updated accordingly within the last year prior to application submission.
- Include protocols for the diagnostic work-up, intervention (including IV alteplase (tPA) dosing and administration guidelines), and patient monitoring required for IV alteplase. Also include guidelines for identification of contraindications to IV alteplase (tPA) (often referred to as inclusion/exclusion criteria) and blood pressure management prior to and during IV alteplase.

What do I need to submit?

- A written stroke protocol for the Emergency Department, which should demonstrate diagnosis and acute treatment of ischemic stroke, transient ischemic attack (TIA), and hemorrhagic stroke patients. Your protocol should coincide with the most recent stroke guidelines and highlight a process that allows for stroke code activation for patients presenting within 24 hours of last known well. This document should include, at a minimum, the following components: activation criteria, roles and responsibilities of the Acute Stroke Team members, time goals, and patient monitoring.
- A one to two page algorithm that supports your written protocol and serves as a guide for stroke care in the code process.
- Order sets that reflect the protocol. Include specific Emergency Department order sets that address: initial work up of an ischemic or hemorrhagic stroke, acute treatment after CT is read, and alteplase dosing, administration, and monitoring.
- Document that supports inclusion/exclusion criteria used for alteplase treatment decision-making.
- If you regularly admit alteplase patients:
  - Please attach a supporting letter signed by the coordinator, explaining circumstances in which you admit alteplase patients.
  - Please attach admitting order sets that are used for the care of these patients.
  - Please attach your facility based dysphagia screening protocol.
What do I need for the site visit?

- MDH review team will ask to see where the protocols, algorithm, inclusion exclusion criteria and other helpful resources are located for staff to reference in the Emergency Department.
- MDH review team will conduct case tracer activity that will include review of order sets utilized in the care of stroke patients.

Resource: Sample Case Tracer Form for Site Visit Case Tracer Activity
Source: Minnesota Department of Health Stroke Program

Example: Appendix B: Sample Written Stroke Protocol
Example: Appendix B1: Sample Stroke Algorithm
Example: Appendix B2: Inclusion Exclusion Criteria
Criteria 3 - EMS COLLABORATION

The EMS stroke protocols should detail how patients with a suspected stroke will be triaged and routed to the most appropriate hospital.

Rationale:

In most settings, a patient with a stroke is taken to the hospital by EMS personnel. The ability of EMS personnel to recognize patients with a possible stroke, provide pre-notification to the receiving hospital, and stabilize and transport such patients is a key element of an Acute Stroke Ready Hospital. Data from recent studies have shown that EMS communication and notification to the ED that a potential stroke patient is en route can shorten door to imaging and door to needle times, both of which are key parameters in receiving IV thrombolytic therapy.

What do I need to submit?

- **EMS Stroke Protocol** for each service that represents more than 30% of your stroke volume. (Optional documents to showcase relationship and collaboration: Drip and Ship/Neuro-assessment protocol from EMS, or a letter detailing process; feedback form to EMS).
- **(Optional) EMS Transfer Protocol** that addresses transporting post alteplase patients. For example Drip and Ship/neuro-assessment protocols, or letter detailing process.

What do I need for the site visit?

- EMS program involvement to be validated at time of site visit (e.g., included in stroke committee meetings, feedback process, education, PI). EMS staff members should be invited to attend the opening and closing session. During the facility tour the MDH review team will interview staff and would appreciate the opportunity to discuss EMS arrivals with an EMS representative. An interactive discussion regarding pre hospital stroke protocols and EMS agency protocols that address transporting post-alteplase.

Example: **Appendix C: EMS Stroke Protocol**

Example: **Appendix C1: EMS Feedback Form**
Criteria 4 - EDUCATION

Education on identification and treatment of acute stroke. In order to provide timely treatment to stroke patients a dedicated team of health care professionals needs to be organized and should have defined roles and responsibilities. The Acute Stroke Team (AST) is available 24/7 and should be comprised of at a minimum a nurse and a provider that respond to stroke in the Emergency Department. The Acute Stroke Ready Hospital should identify members of the Acute Stroke Team. Each member of the AST (all nurses and providers that respond to stroke code in the ED) are required to receive stroke education at least two hours or two times per year. Note, the AST may also include laboratory, radiology, pharmacy, and other departments and may be incorporated into the educational plan.

Rationale:

Most patients with acute stroke will enter the ASRH through the emergency department. It is essential for emergency department providers to have protocols for the acute diagnosis, stabilization, monitoring, and treatment of stroke patients. Staying up-to-date on current guidelines of care is vitally important in order to ensure safe care for all patients can be given.

What do I need to submit?

- A detailed table of the stroke education plan for the next three years with estimated date, staff targeted (AST) and expected educational hours. (Be sure to include providers.) Locums and casual providers should also be included if used at your facility.
- Onboarding education for new hires is required to be included in the education plan.
- For locum providers or casual providers it is acceptable to use an attestation letter completed by the provider detailing the date and stroke education completed externally.
  - Please do NOT include your educational materials, PowerPoints, agendas or attendance lists. (Keep these education details in your files for validation at the site visit.)
  - Stroke education does not need to be formal CEU/CME. It is recommended that education is clinically based and supports bedside care of stroke patients. Examples of stroke education for your AST members and other staff involved in the care of stroke patients may include but is not limited to:
    - Mock Stroke Codes
    - IV alteplase mixing and administration competencies
    - IV alteplase post monitoring including BP, neuro checks, and complications
    - NIHSS certification or training
    - Case reviews
    - BP management
    - MDH learnings
    - Policy review

**For ASRHs that admit IV alteplase patients, it is strongly encouraged to include ICU nursing staff and admitting providers in the required stroke education.**
**What do I need for the site visit?**

The MDH review team will request to view your educational tracking system/records. Be prepared to illustrate the educational offerings that have been provided over the last twelve months and be prepared to validate nurse or provider participation in education. Acceptable options to track may include: educational records maintained in each individual employee personnel file or keeping a master list of participants for each educational offering, attestation forms, sign-in sheets, etc.

- **Example: Appendix D: Sample Stroke Education Plan**
- **Example: Appendix D1: Sample Locum/Casual provider external education attestation letter**
Criteria 5 - LAB TESTING CAPABILITY

The capacity to complete basic laboratory tests 24 hours a day, 7 days a week.

Rationale:

The ability to perform and complete basic laboratory testing on patients with a stroke is essential for diagnosing metabolic and infectious disorders that can masquerade as a stroke syndrome, to ensure stroke patients can be treated with the proper medications, and to determine the possible etiology of some types of stroke.

What do I need to submit?

- Scope of Service (SOS) or policy document - delineating:
  - Lab hours of operation
  - On-site
  - On-call including response times
  - Process for STAT labs

  If the above required details are not included in SOS or policy, please submit a supporting letter on hospital letterhead attesting to these components. The letter should be co-signed by the Director of Laboratory services and the Stroke Coordinator.

  Documents should be updated to include all of the above details for the next application submission round.

What do I need for the site visit?

- The MDH review team will ask to speak to lab staff to validate submitted documents.
Criteria 6 - BRAIN IMAGING CAPABILITY

The capacity to perform and interpret brain imaging studies 24/7.

Rationale:

Brain imaging confirms the absence of contraindications to thrombolytic therapy and help diagnose hemorrhagic strokes. This is an essential function of an acute stroke ready hospital. In most cases, the first (and perhaps only) imaging study readily available will be a non-contrast head CT scan.

- Acute brain imaging capabilities and interpretation services must be available on a 24/7 basis. It is acceptable to have stroke providers that have experience in reading scans to provide the initial interpretation. Personnel providing the final read should be board-certified radiologists.

- If your facility has CT-angiogram capabilities, work closely with your Primary or Comprehensive Stroke Center partner to identify and implement a process to evaluate patients for endovascular therapy (e.g., mechanical thrombectomy).

What do I need to submit?

- Scope of Service (SOS) or policy document delineating
  - Radiology hours of operation
  - On-site
  - On-call including response times
  - Radiology services
  - Coverage times
  - Read back times
  - STAT status for stroke

  - If the above required details are not included in SOS or policy, please submit a supporting letter on hospital letterhead attesting to these components. The letter should be co-signed by the Director of Radiology services and the Stroke Coordinator.

  - Documents should be updated to include all of the above details for the next application submission round

What do I need for the site visit?

- The MDH review team will ask to speak to Radiology staff to validate submitted documents.

Example: Appendix E: SOS or Policy for Lab and Radiology
Criteria 7 - DATA COLLECTION AND UTILIZATION

Demonstrate collection of data and utilization of data for performance improvement.

Rationale:
A successful, effective, and sustainable stroke program at an Acute Stroke Ready Hospital requires dedicated staff, establishment of key structural processes, and a commitment to continuous quality improvement.

- Demonstrate that there is a process in place to utilize the data you capture. What do you do with the data that you collect? For example:
  - Establish a stroke code activation log (Criteria 1)
  - Identify cases to track for performance improvement
  - Abstract and submit data on stroke patients into the Minnesota Stroke Registry
  - Provide feedback on individual patients to staff
  - Provide feedback to EMS
  - Evaluate your performance by utilizing a case review tracking log with established program goals
  - Identify program goals and conduct performance improvement projects
  - Review your data in a regularly convened meeting. This can be in an existing structure, such as an ED or trauma meeting, or in a separate Stroke Committee meeting, and should involve the Acute Stroke Team and other providers who touch stroke patients (e.g., ED physicians, nurses, radiology, lab, and registration). This provides an opportunity for all to review care and identify areas to improve.

What do I need to submit?

**Ensure you are up-to-date on data submission in the Minnesota Stroke Registry**

Evidence of data collection – Reports should be run from 2017 to current date and uploaded into your application. All of the reports listed below are available in the Minnesota Stroke Portal. Program-specific time interval goals may vary. We support the Target: Stroke interval goals. (Reference Example: Appendix G: Phase III Target: Stroke Suggested Time Interval Goals).

1. **Door to stroke team activation**
   - The stroke team at a minimum is one nurse and one provider.
   - Should be activated as soon as suspected stroke is identified. Notify the stroke team within 15 minutes of arrival

2. **Door to provider**
   - Rapid evaluation by provider can ensure stability and evaluates for other emergency diagnoses
   - Perform an initial patient evaluation within 10 minutes of arrival
3. **Door to telestroke activation**
   - Should be activated as soon as suspected stroke is identified. Rapid neurologic evaluation should be performed within the ED as soon as possible. Notify within 15 minutes of arrival
   - BAC recommends that the telestroke link is *established* within 20 minutes of consult request

4. **Door to imaging initiated**
   - Imaging should be completed as soon as possible to determine treatment eligibility.
   - CT scan initiated within 25 minutes of arrival

5. **Door to imaging read**
   - Interpretation of imaging should be done rapidly to exclude ICH prior to IV alteplase administration
   - Interpret the CT scan within 45 minutes of arrival

6. **Door to needle**
   - Once eligibility is determined and ICH excluded, IV alteplase should be given promptly without delay.
   - IV alteplase administered within 60 minutes of arrival

7. **Door in door out**
   - Transferred within 120 minutes of arrival

- **Evidence of utilization of data for performance improvement.** Upload projects around performance improvement efforts. This may include action plans, data tracking sheets, meeting minutes, and results.

- **Upload Stroke Meeting agendas and meeting minutes** from the last year.

- **Upload case review or feedback forms.**
What do I need for the site visit?

▪ The afternoon includes the data and performance improvement session. Utilize the PowerPoint template that is available for showcasing your data and program PI efforts.
▪ Please include your door-to-metric tracking from 2017 to current date.
▪ Include information about other PI efforts that may not coincide with door-to metric tracking (e.g., neuro check/bp monitoring/documentation). Make sure to include program specifics regarding how you do case review and follow-up.

Resource: Stroke Patient Care Performance Improvement Guide
Resource: Acute Stroke Ready Hospital Site Visit Data and PI Presentation Template
Source: Minnesota Department of Health Stroke Program Resources
Example: Appendix F: Performance Improvement Model

Example: Appendix G: Phase III Target: Stroke Suggested Time Interval Goals
Example: Appendix G1: Target: Stroke Time Tracker Phase 3
Example: Appendix G2: Sample Stroke Code Case Review Form
Example: Appendix G3: Sample Tracking PI Project Form
Criteria 8 - TRANSFER PROTOCOLS

Transfer protocols and agreements for stroke patients.

Rationale:

Many stroke patients at an Acute Stroke Ready Hospital will require emergent transportation to a Primary and/or Comprehensive Stroke Center. In some cases, the transfer will occur as soon as possible after acute therapy is initiated; in other cases the patient might require a longer stay at the ASRH if s/he is medically unstable. Even in such cases, transfer to a Primary and or Comprehensive Stroke Center with more resources should occur as soon as possible, since a higher level of care is likely to ultimately benefit even the unstable patient. Written transfer protocols and agreements ensure that ground or air transportation arrangements are unambiguous, expectations for en-route care are clear, and appropriate documentation on the patient is provided to the receiving hospital.

What do I need to submit?

- **A stroke specific transfer protocol from your own facility.** This document should outline what you do to initiate and complete a transfer of a stroke patient. Include specifics such as phone numbers for receiving facility and for EMS options, considerations for mode of transport, medical management and information transfer.

- **A stroke-specific transfer agreement or memorandum of agreement (MOA)** with at least one Primary or Comprehensive Stroke Center. This document must include the 24/7 availability of neurosurgery and endovascular therapy (mechanical thrombectomy) capabilities. This may require a second agreement with a hospital that has endovascular therapy (mechanical thrombectomy) capabilities.

What do I need for the site visit?

- MDH review team will facilitate an active discussion with acute stroke team response members regarding the process of transferring an acute stroke patient to higher level of care.

Example: Appendix H: Sample Stroke Specific Transfer Protocol

Example: Appendix H1: Sample Memorandum of Agreement
Criteria 9 - STROKE LEADERSHIP TEAM

A designated stroke program leadership team, including a stroke coordinator and medical director.

Rationale:
Medical leadership for the stroke program at an Acute Stroke Ready Hospital is essential. In some settings, advanced practice nurses have been very successful in leading a stroke center. Whoever the leader is, s/he should have demonstrated experience and expertise in the care of patients with cerebrovascular disease.

What do I need to submit?
- Letter on hospital letterhead co-signed by the designated stroke medical director, designated stroke coordinator and CEO attesting that each will serve in this capacity for the hospital.

What do I need for the site visit?
- Data and performance improvement session should include active discussion on roles and responsibilities of the stroke coordinator OR how responsibilities for program components are divided among staff. Including but not limited to: telestroke, EMS feedback, collaboration; protocols and maintenance; education; data abstraction; PI

Example: Appendix I: Stroke Leadership Letter

CEO ATTESTATION LETTER

Rationale:
The CEO must attest that the application is accurate and current. The signed letter should declare that the documentation provided is a true representation of the hospital’s processes, protocols and capabilities.

What do I need to submit?
- Letter on hospital letterhead signed by the CEO, attesting to the accuracy of the application. A template can be generated from the CEO Attestation Letter section by clicking on the blue hyperlinked CEO Attestation Letter Download.
Appendix A: Sample Acute Stroke Team Activation Log

We require tracking all acute stroke team activations. We also encourage review of all activations regardless of final clinical diagnosis in order to access overall process. You may choose to enter all stroke alert activations into the Registry for performance tracking.

<table>
<thead>
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<th>Activation Date</th>
<th>Clock Time</th>
<th>Time of Stroke Team Response to bedside (clock time)</th>
<th>Treatment</th>
<th>Final Dx</th>
<th>Disposition</th>
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<td>1:05</td>
<td>MRI</td>
<td>Ischemic Stroke</td>
<td>Admitted 3101</td>
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<tr>
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<td>6:55</td>
<td>IV alteplase</td>
<td>Ischemic Stroke</td>
<td>CSC Hospital</td>
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<td>03/01/2019</td>
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<td>8:25</td>
<td>BP management</td>
<td>Hypertensive crisis</td>
<td>Home</td>
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<td>04/01/2019</td>
<td>4:00</td>
<td>4:03</td>
<td>D50</td>
<td>Hypoglycemia</td>
<td>Home</td>
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<td>05/01/2019</td>
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<td>TIA</td>
<td>Admitted 3110</td>
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<td>Seizure</td>
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<td>08/01/2019</td>
<td>14:18</td>
<td>14:20</td>
<td>BP management</td>
<td>ICH</td>
<td>Expired</td>
</tr>
<tr>
<td>09/01/2019</td>
<td>5:39</td>
<td>5:44</td>
<td>Zofran</td>
<td>Migraine</td>
<td>Home</td>
</tr>
<tr>
<td>10/01/2019</td>
<td>12:08</td>
<td>12:15</td>
<td>IV alteplase</td>
<td>Ischemic Stroke</td>
<td>CSC Hospital</td>
</tr>
<tr>
<td>11/01/2019</td>
<td>13:02</td>
<td>13:08</td>
<td>BP management</td>
<td>SAH</td>
<td>CSC Hospital</td>
</tr>
<tr>
<td>12/01/2019</td>
<td>01:10</td>
<td>01:12</td>
<td>None</td>
<td>TIA</td>
<td>Home</td>
</tr>
</tbody>
</table>
Appendix B: Sample Written Stroke Protocol

Stroke Care- ETC

PURPOSE
To provide a process for rapid detection and treatment when a patient displays stroke-like symptoms.

CentraCare Health adopts the following Policy/Procedure for:
St. Cloud Hospital

POLICY
A. Care will be provided to all patients presenting with stroke like symptoms.
B. Code stroke will be activated for patients that meet criteria.

DEFINITIONS
Stroke Response Team: Consists of the Charge Nurse, RN, ED Physician, Patient Care Extender, ETC Technician, Stroke Provider, CT Technologist, Patient Access, Patient Placement Coordinator or Nursing Supervisor, Stroke Coordinator and Stroke Nurse (when available).
EMS: Emergency Medical Services
LTKW: Last Time Known Well
BEFAST: Balance-Eyes-Face-Arms-Speech-Time
VAN: Vision-Aphasia-Neglect

PROCEDURE / GUIDELINE
A. Code Stroke Screen:
   1. Perform blood glucose (if not done by EMS prior to arrival).
   2. Determine the LTKW.
   3. If the LTKW is < 4.5 hours a BEFAST screen will be completed by the RN.
      a. Balance: ask the patient if they had a sudden loss of balance, coordination, unsteadiness, or unexplained dizziness.
         i. Normal: no sudden loss of balance, coordination, unsteadiness, or unexplained dizziness.
         ii. Abnormal: sudden loss of balance, coordination, unsteadiness, or unexplained dizziness.
      b. Eyes: ask the patient if they had a sudden change in vision. Particularly to one eye (blurred, double, loss). Test visual fields for loss of vision or field cut.
         i. Normal: no change in vision.
         ii. Abnormal: patient reports sudden change in vision, particularly to one eye or nurse appreciates loss of vision or field cut during visual field testing.
      c. Face: ask the patient to smile and observe for facial droop. Does the patient have facial numbness?
i. Normal: both sides of face move equally and no numbness.
ii. Abnormal: one side of the face is uneven, weak, or numb.

4. If the LTKW is 4.5-24 hours a VAN screen will be completed by the RN.
   a. How weak is the patient on one side of the body? Ask the patient to hold arms up for 10 seconds
      i. Mild (minor drift)
      ii. Moderate (severe drift-touches or nearly touches the bed/ground)
      iii. Severe (flaccid or not antigravity)
      iv. No Weakness. VAN negative. Do not proceed to next step.
   b. Visual disturbance?
      i. Field Cut - test all 4 quadrants
      ii. Double Vision - ask the patient to look to the right then left, look for uneven eyes.
      iii. Blind - new onset
      iv. None
   c. Aphasia?
      i. Expressive - Ask the patient to name 2 objects. Don't count slurring of words
      ii. Receptive - ask the patient to close eyes, make fist
      iii. Mixed
      iv. None
   d. Neglect?
      i. Forced gaze or inability to track to one side
      ii. Unable to feel both sides at the same time, or unable to identify own arm
      iii. Ignoring one side
      iv. None
   e. VAN positive = Weakness plus any one of the VAN screens positive.

5. Code Stroke will be activated, if the BEFAST or VAN are positive and the blood glucose is greater than 50,
   by dialing "3333" and verbalizing Code Stroke, floor, unit, and room number.

6. If the BEFAST or VAN is negative, or the blood glucose is less than 50, patient does not meet Code Stroke
   criteria.

B. Code Stroke Process (refer to Addendum A):
   1. A pit stop will occur, in the hallway between garage and Triage, on all patients presenting to the ETC
      who meet Code Stroke Criteria.
      a. Patient Access to arrive and provide identification band.
      b. ED physician to perform a quick assessment to confirm stroke.
      c. RN or ED physician enter CCH ED Stroke Order Set.
d. EMS if present, provide handoff.
   c. Code Stroke Team accompanies patient to CT.
2. Do not delay CT scan for lab work, EKG, or detailed exam.
3. ETC Technician to bring a cart with a scale to CT (when applicable).
4. PCE will log onto the Tele-stroke equipment in CT and prepare to draw labs.
5. After non-contrast CT is completed, Stroke Provider to perform quick assessment.
6. If the Stroke Provider is unavailable, or labs are unable to be drawn, patient will return to ED for continued care. Log onto Tele-stroke equipment upon return to ED exam room and draw labs.
7. If Alteplase is ordered, begin immediately, verify that the Alteplase orders for stroke are in place and prepare for ICU admission.
8. If Alteplase is not ordered, prepare for admission to a non-ICU monitored bed.
9. If the patient is a thrombectomy candidate, prepare for immediate transport to the OR. If available, start Alteplase bolus and infusion before proceeding to OR.
C. Canceling a Code Stroke:
   1. ED physician or Stroke provider can cancel Code Stroke.
   2. RN or designee calls "3333" to cancel code and provide room number.
   3. RN or ED physician to cancel CCH ED Code Stroke orders.
   4. RN to document cancellation in the Stroke Narrator.
D. Stroke Like Symptoms (non-Code Stroke):
   1. If the LTKW is >24 hours and the VAN screen is positive:
      a. Keep head of bed elevated 30 degrees.
      b. Keep patient NPO.
      c. Neuro checks with vital signs (BP, HR, RR) and pulse oximetry hourly.
      d. BEFAST or VAN screen in Traje substitutes for neuro exam prior to rooming patient.
      e. Notify provider of diastolic BP > 120 or systolic BP > 220. If hemorrhagic stroke, notify provider if systolic > 160 and diastolic > 60.
      f. Immediately notify provider for change in neurological status, development or of new symptoms, or if patient exhibits signs of increased intracranial pressure (ICP) such as nausea, vomiting, reduced level of consciousness, disconjugate gaze, posturing, etc.
   2. If the LTKW is >34 hours and the VAN screen is negative revert to standard of care.

REFERENCE CITATIONS

National Guidelines/National Standards/Regulatory

APPROVING COMMITTEE(S)

SCH - Emergency Trauma Center Practice Committee.
Appendix B1: Sample Stroke Algorithm

ETC Code Stroke Process Algorithm

Patient arrives with stroke like symptoms

- Make evaluation
  - Glucose
  - BEFAST

Based on Initial ED room patient or waiting room

BEFAST Positive & Glucose Normal?

- Activate Code Stroke
- PI Stop must in track between garage and image
- RN or ETC Physician initiates ED Stroke/Stroke Set
- Patient goes patient to CT

- Printer sends setup images to CT
- Photo/PCI sets up telestroke equipment in CT and doctor does after CT completed

- Telestroke quick access to determine LUMIN IV needed

- Patient returns to ETC after CT return

- Stroke Provider completes assessment, verifies LUMIV and screen for Airplane and thrombectomy exclusion criteria per NIH Guidelines

If Airplane candidate?

- Admit Airplane

If Thrombectomy candidate?

- Proceed to OR

- Admit to ICU

If No Airplane candidate?

- Admit to appropriate unit

CT Scan completed? Yes

- Yes Blood

- Prepare patient for admission to appropriate unit or surgery

Consulting Code Stroke
- Only ETC Physician or Stroke Provider can cancel
- Name or designees call "5333" to cancel and provide room number

Disclaimer: The policies, guidelines and procedures posted on CentraCare are for internal use only. They may not be copied by independent companies or organizations that have access to documents, as CentraCare Health cannot guarantee the relevance of these documents to external entities.
Referring Hospital Acute Ischemic Stroke Protocol

**PATIENT ARRIVAL VIA EMS/TRIAGE WITH S/S STROKE**

**EMERGENCY DEPARTMENT ASSESSMENT:**

- If time Last Known Well (LKW) is <8 hours, or 8-24 hours for NIHSS equal to or greater than 6, or undue onset time of symptoms

  - Expedite to CT
    - EMS/RN/MD confirm S/S
    - Confirm stability
    - Confirm glucose check >50 mg/dl
    - MD order: Non-contrast head CT
    (Goal <10 min)

**STROKE NEUROLOGY CONSULT**

ONE CALL TRANSFER CENTER: 612-863-1000

(No. <10 min)

- Non-Contrast Head CT Review tPA Eligibility

**NEGATIVE HEAD CT/TPA CANDIDATE?**

ADMINISTER FULL DOSE IV tPA

(No. <40 min D2N)

- DO NOT delay tPA while proceeding with Intra - Arterial (IA) workup

- NIHSS ≥6 or global aphasia

*YES*

- Abbott Northwestern Hospital stroke neurologist will contact NIR for consideration of IA Treatment, if deemed appropriate

*NO*

- Plan urgent transfer

- Positive CT Results = Bleed
  Consult Neurosurgery or Neuro Interventionsal Radiologist (NIR) as appropriate

**To contact the Stroke Neurology Service:**
One Call Transfer Center
Any patient. Any time. 612-863-1000
Appendix B2: Inclusion Exclusion Criteria

Inclusion and Exclusion Criteria for IV Alteplase Treatment of Ischemic Stroke

FOR CONSIDERATION OF ELIGIBILITY WITHIN 0-4.5 HOURS OF TIME LAST KNOWN WELL

INCLUSION CRITERIA: Patients who should receive IV alteplase

- Symptoms suggestive of ischemic stroke that are deemed to be disabling, regardless of improvement. Refer to the list at the end of this document for considered disabling symptoms.
- Able to initiate treatment within 4.5 hours of Time Last Known Well (document clock time)
- Age 18 years or older

EXCLUSION CRITERIA: If patient has any of these, do NOT initiate IV alteplase

- CT scan demonstrating intracranial hemorrhage
- CT exhibits extensive regions (>1/3 MCA Territory on CT) of clear hypodensity
- Unable to maintain BP <185/110 despite aggressive antihypertensive treatment
- Severe head trauma within last 3 months
- Active internal bleeding
- Arterial puncture at non-compressible site within last 7 days
- Infective endocarditis
- Gastrointestinal or genitourinary bleeding within last 21 days or structural GI malignancy
- Intracranial or spinal surgery within last 3 months

Laboratory:

- Blood glucose <50 mg/dL; however, should treat if stroke symptoms persist after glucose normalized. Results not required before treatment unless patient is on anticoagulant therapy or there is another reason to suspect on abnormality
- INR >1.7
- Platelet count <100,000, PT >15 sec, aPTT >40 sec

Medications:

- Full dose low molecular weight heparin (LMWH) within last 24 hours (patients on prophylactic dose of LMWH should NOT be excluded)
- Received novel oral anticoagulant (DOAC) within last 48 hours (assuming normal renal metabolizing function)
- Commonly prescribed DOACs: apixaban (Eliquis), dabigatran (Pradaxa), rivaroxaban (Xarelto), edoxaban (Savaysa)
CONSIDERATION FOR EXCLUSION: Seek neurology consultation from a stroke expert

- Mild stroke with non-disabling symptoms
- Pregnancy
- Major surgery or major trauma within 14 days
- Seizure at onset and postictal impairment without evidence of stroke
- Myocardial infarction within last 3 months
- Acute pericarditis
- Lumbar puncture within 7 days
- Ischemic stroke within last 3 months
- Any other condition or history of bleeding diathesis which would pose significant bleeding risk to patient
- History of intracranial hemorrhage
- Presence of known intracranial conditions that may increase risk of bleeding (arteriovenous malformation, aneurysms >10mm, intracranial neoplasm)
- High likelihood of left heart thrombus (e.g., mitral stenosis with atrial fibrillation)
- Blood glucose >400 mg/dL (however should treat with IV alteplase if stroke symptoms persist after glucose normalized)

CONSIDERED DISABLING SYMPTOMS: Should be considered for IV alteplase treatment

1. Complete hemianopsia (≥2 on NIHSS question 3) or severe aphasia (≥2 on NIHSS question 9) or
2. Visual or sensory extinction (≥1 on NIHSS question 11) or
3. Any weakness limiting sustained effort against gravity (≥2 on NIHSS question 6 or 7) or
4. Any deficits that lead to a total NIHSS score ≥5 or
5. Any remaining symptoms considered potentially disabling in the view of the patient and the treating practitioner? i.e., do presenting symptoms interfere with lifestyle (work, hobbies, and entertainment)? Clinical judgement is required.
   a. Note: this is an example based on current best practices for hospitals to implement and operationalize. Specific criteria may vary by hospital.


This document was developed by the Minnesota Primary and Comprehensive Stroke Center Advisory Group. Created 03/30/17; Updated 08/15/18 Updated 05/08/2019

For questions, please contact MDH Stroke Program at health.stroke@state.mn.us
Appendix C: EMS Stroke Protocol

A Stroke protocol from EMS should include the following components:

▪ Assessment
▪ Glucose check
▪ Oxygen to maintain saturations > 94%
▪ Activation criteria
▪ Pre-notification using consistent terminology “code stroke” or “stroke alert”
▪ Neurological exam to assess for changes (BE FAST, LAMS, RACE, Cincinnati)
▪ Establish Last Known Well as clock time
▪ Transport to the nearest appropriate state-designated facility
Appendix C1: EMS Stroke Feedback Form

EMS - Stroke Patient Status Report
Provided by Regions Hospital. CONFIDENTIAL, NOT FOR GENERAL POSTING

<table>
<thead>
<tr>
<th>Date of Service:</th>
<th>Age/Gender:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service:</td>
<td>Incident Number:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yes / No</th>
<th>Run Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes / No</td>
<td>Cincinnati Stroke Scale Completed and Documented</td>
</tr>
<tr>
<td>Yes / No</td>
<td>Blood Glucose</td>
</tr>
<tr>
<td>Yes / No</td>
<td>Medications, e.g., Use of Anticoagulants</td>
</tr>
<tr>
<td>Yes / No</td>
<td>Last Known Well Time (hh:mm)</td>
</tr>
<tr>
<td>Yes / No</td>
<td>IV Access Established</td>
</tr>
<tr>
<td>Yes / No</td>
<td>Blood Pressure</td>
</tr>
<tr>
<td>Yes / No</td>
<td>Treatment En route</td>
</tr>
<tr>
<td>Yes / No</td>
<td>Activation of Stroke Code Within Time Parameters</td>
</tr>
</tbody>
</table>

Admitting Diagnosis:

Discharge Diagnosis:

Final Diagnosis of Stroke: Acute Ischemic Stroke / Intracerebral Hemorrhage / Subarachnoid Hemorrhage / Stroke Mimic

Treatment Teams: Neurology / Neurosurgery / NeuroCritical Care / Neurointerventional Radiology / Cardiology / Rehabilitation /

Door to CT Time: Minutes

<table>
<thead>
<tr>
<th>IV Alteplase Treatment</th>
<th>Endovascular Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to Bolus/Infusion</td>
<td>Door to Groin Puncture</td>
</tr>
<tr>
<td>Minutes</td>
<td>Minutes</td>
</tr>
<tr>
<td></td>
<td>TICI Pre-Procedure</td>
</tr>
<tr>
<td></td>
<td>0 1 2 2a 2b 3 3b</td>
</tr>
<tr>
<td></td>
<td>TICI Post-Procedure</td>
</tr>
<tr>
<td></td>
<td>0 1 2 2a 2b 3 3b</td>
</tr>
</tbody>
</table>

Admission NIHSS: [Blank]

Discharge NIHSS: [Blank]

Discharge Date: [Blank]

Discharge Destination: Home / TCU / Inpatient Rehab

Regions Hospital®
Stroke Center

Thank you for your partnership. If you have any questions or would like to develop stroke education for staff, please contact Carol at 651-254-3703 or carol.j.droegemeier@healthpartners.com

This information is being shared with you for the sole purpose of quality review and improvement.
Appendix D: Sample Stroke Education Plan

Sample Stroke Education Plan

A detailed table of the stroke education plan for the next three years with estimated date, staff targeted and expected educational hours (be sure to include providers). Individual staff records of completed staff education should be kept.

<table>
<thead>
<tr>
<th>Year</th>
<th>Department</th>
<th>Hours needed</th>
<th>Content</th>
<th>Date assigned</th>
<th>Content hours</th>
</tr>
</thead>
</table>
| 2019 | ED & ICU nursing      | 2 hours or 2x annually | • IV alteplase competency
• NIHSS certification | 01/01/2019       | 0.5 hours (3 hours) |
|      |                       |              |                                              | 03/01/2019         |               |
|      | All nursing staff     | Annual       | • Stroke code process                        | 01/01/2019         | 0.5 hours     |
|      | ED providers          | 2 hours or 2x annually | • Annual Stroke education- provided by Telestroke partners
• NIHSS refresher | 05/15/2019       | 1 hour                                     |
|      |                       |              |                                              | 03/01/2019         | 1 hour        |
| 2020 | ED & ICU nursing      | 2 hours or 2x annually | • IV alteplase competency
• Mock code         | 01/01/2020       | 0.5 hours (1 hour) |
|      |                       |              |                                              | 03/01/2020         |               |
|      | All nursing staff     | Annual       | • Stroke code process                        | 01/01/2020         | 0.5 hours     |
|      | ED providers          | 2 hours or 2x annually | • Annual Stroke education- provided by Telestroke partners
• Mock code         | 05/15/2020       | 1 hour                                     |
|      |                       |              |                                              | 03/01/2020         | 1 hour        |
| 2021 | ED & ICU nursing      | 2 hours or 2x annually | • IV alteplase competency
• Dysphagia screening | 01/01/2021       | 0.5 hours (0.5 hours) |
|      | All nursing staff     | Annual       | • Stroke code process                        | 01/01/2021         | 0.5 hours     |
|      | ED providers          | 2 hours or 2x annually | • Annual Stroke education- provided by Telestroke partners
• Inclusion/exclusion criteria IV alteplase | 05/15/2021       | 1 hour                                     |
<p>|      |                       |              |                                              | 03/01/2021         | 0.5 hours     |</p>
<table>
<thead>
<tr>
<th>Onboarding Education Plan</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ED &amp; ICU nursing</td>
<td>IV alteplase competency</td>
</tr>
<tr>
<td></td>
<td>Neuro checks &amp; BP management</td>
</tr>
<tr>
<td></td>
<td>Stroke code process</td>
</tr>
<tr>
<td></td>
<td>Dysphagia screening</td>
</tr>
<tr>
<td>All nursing staff</td>
<td>Stroke code process</td>
</tr>
<tr>
<td></td>
<td>Dysphagia screening</td>
</tr>
<tr>
<td></td>
<td>Neuro checks &amp; BP management</td>
</tr>
<tr>
<td>ED providers</td>
<td>Stroke code process</td>
</tr>
<tr>
<td></td>
<td>NIHSS</td>
</tr>
<tr>
<td>All new employees</td>
<td>Stroke code process</td>
</tr>
</tbody>
</table>
Appendix D1: Sample Locum/Casual provider external education attestation letter

Example Locum/Casual Provider External Education Attestation Letter

<<Fill in date here>>

To whom it may concern,

Acute Stroke Ready Hospital Designation criteria 4- All AST (Acute Stroke Team) members (at a minimum all nurses and providers that respond to stroke) are required to receive stroke education at least two hours or two times per year.

I understand the education requirements of the designated Acute Stroke Ready Hospital that of which I am currently employed. I have completed at least two hours or two educational sessions specific to stroke in the last 12 months as outlined below.

Date completed _____ Content ____________________________________________ Content hours _____

Date completed _____ Content ____________________________________________ Content hours _____

Date completed _____ Content ____________________________________________ Content hours _____

Date completed _____ Content ____________________________________________ Content hours _____

By my signature below, I attest that the information provided above is true and correct to the best of my knowledge.

Sincerely,

__________________________________________

Handwritten Signature                Date
Appendix E: SOS or Policy for Lab and Radiology

These sections require the submission of a Scope of Service or a Policy document for both Laboratory and Radiology services. These should include the following components:

▪ Description of 24/7 services, with times of on-site and on-call services stated
▪ Description of any on-call staff, with roles and response times to hospital
▪ Description of contract radiology services, including times of coverage, read back times, and STAT status for strokes

If the above required details are not included in SOS or policy please submit a supporting letter on hospital letterhead attesting to these components. This should be co-signed by the director of services AND stroke coordinator. Please update these documents to include all details for the next application round.
Appendix F: Performance Improvement Model

1. Stroke Code Activation Log (Criterion 1) - Tracking tool for case identification

2. Identify Cases and Keep a Stroke Code PI Log
   - Stroke Code PI Log = data collection tool for case performance
   - All stroke code activations - regardless of final diagnosis
   - Established process goals/metrics for key time intervals
   - Reference Target: Stroke Campaign Manual
   - Process goals may vary
   - Note: For some the activation log and PI log are the same document

3. Registry
   - Submit confirmed stroke cases to Minnesota Stroke Registry (Portal)
   - OPTIONAL: Include all stroke code activations to create a comprehensive case-level performance improvement report
   - Only eligible cases will be included on metric reports (e.g., SCRIMS)

Feedback and Evaluation
Case performance review
- All stroke code activations assessed and abstracted, leading to individual case feedback and evaluation of overall program performance
- All stroke code activations can be submitted into Minnesota Stroke Registry Tool regardless of final diagnosis
- Overall performance of all stroke code activations can be tracked and evaluated with facility-based tools

4. Feedback
   - Individual feedback on case performance
     - Stroke Code response team
     - Stroke Program Committee

5. Evaluation
   - Collective evaluation of established process goals on key time intervals
     - Minnesota Stroke Registry case level reports or Facility-based reports
     - Total overall program performance evaluated on regular basis
     - Program performance reviewed with Stroke Committee

6. Performance Improvement
   - Identify an area for improvement from overall program performance evaluation
     - Design a plan
     - Present plan to committee/team members for approval/support
     - Implement plan, collect data, evaluate results, & report back to Stroke Committee
     - Celebrate your successes!
Appendix G: Phase III Target: Stroke Suggested Time Intervals

PHASE III TARGET: STROKE™
SUGGESTED TIME INTERVAL GOALS

THE 30 MINUTES DTN GOAL TIME INTERVAL GOALS ARE:

<table>
<thead>
<tr>
<th>ACTION</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to physician</td>
<td>≤2.5 minutes</td>
</tr>
<tr>
<td>Door to stroke team</td>
<td>≤5 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI initiation</td>
<td>≤15 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI interpretation</td>
<td>≤25 minutes</td>
</tr>
<tr>
<td>Door to needle time</td>
<td>≤30 minutes</td>
</tr>
</tbody>
</table>

THE 45 MINUTES DTN GOAL TIME INTERVAL GOALS ARE:

<table>
<thead>
<tr>
<th>ACTION</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to physician</td>
<td>≤5 minutes</td>
</tr>
<tr>
<td>Door to stroke team</td>
<td>≤10 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI initiation</td>
<td>≤20 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI interpretation</td>
<td>≤35 minutes</td>
</tr>
<tr>
<td>Door to needle time</td>
<td>≤45 minutes</td>
</tr>
</tbody>
</table>

THE 60 MINUTES DTN GOAL TIME INTERVAL GOALS ARE:

<table>
<thead>
<tr>
<th>ACTION</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to physician</td>
<td>≤10 minutes</td>
</tr>
<tr>
<td>Door to stroke team</td>
<td>≤15 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI initiation</td>
<td>≤25 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI interpretation</td>
<td>≤45 minutes</td>
</tr>
<tr>
<td>Door to needle time</td>
<td>≤50 minutes</td>
</tr>
</tbody>
</table>

THE 90 MINUTES DTN GOAL TIME INTERVAL GOALS ARE:

<table>
<thead>
<tr>
<th>ACTION</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door to physician</td>
<td>≤15 minutes</td>
</tr>
<tr>
<td>Door to stroke team</td>
<td>≤20 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI initiation</td>
<td>≤35 minutes</td>
</tr>
<tr>
<td>Door to CT/MRI interpretation</td>
<td>≤45 minutes</td>
</tr>
<tr>
<td>Door to needle time</td>
<td>≤50 minutes</td>
</tr>
<tr>
<td>Door to patient arrival in NI suite</td>
<td>≤75 minutes</td>
</tr>
<tr>
<td>Door to puncture</td>
<td></td>
</tr>
<tr>
<td>Door to device</td>
<td>≤90 minutes</td>
</tr>
</tbody>
</table>

The suggested time intervals are intended to facilitate time interval benchmarking and quality improvement efforts towards achieving the Target: Stroke™ and D TO GOALs. The interval benchmarks may be modified as needed. Individual institutions may wish to modify these to achieve ultimate intervention within recommended time frame.
Appendix G1: Target: Stroke Time Tracker

**ACUTE ISCHEMIC STROKE TREATMENT GOAL:**
- DTN Time Within 60 Minutes
- DTN Time Within 45 Minutes
- DTN Time Within 30 Minutes
- DTD Time Within 90 Minutes (Direct Arriving)
- DTD Time Within 60 Minutes (Transfers)

**Last Known Well Date:** __________  
**Time:** __________

**Weight:** _________ (kg)  
**Total IV thrombolytic Dose:** _________ (mg)  
**IV thrombolytic Bolus:** _________ (mg)

**Clock starts for Door-to-Needle (DTN) and/or Door-to-Device (DTD):**

**Patient Arrival:**
- Stroke Team Activation:
- Stroke Team Arrival:
- ED Physician Assessment:
- Brain Imaging Ordered:
- Brain Imaging Initiated:
- Brain Imaging Interpreted:
- Lab Tests Ordered:
- Lab Test Completed:
- IV thrombolytic Ordered*
- IV thrombolytic initiated: (Goal < 60, 45 or 30 minutes)

**Interventional team activated:**
**Interventional team arrival:**

**Patient arrival in interventional suite:**
**Puncture:**

- **First pass of mechanical reperfusion device (Goal < 60, 90 minutes)**
- **Reperfusion (TICI Grade 2B/3 achieved)**

**Date only needs to be entered once, unless the time span crosses midnight and date changes**
*If IV thrombolytic not given or delayed, select reasons for non-treatment within the Patient Management Tool™ (PMT). See Get With The Guidelines® coding instructions for definitions.

- **DTN Time data feedback provided.**

**DOOR TO DEVICE (DTD):**
**If mechanical reperfusion not achieved or delayed, select reason(s) for non-treatment within the Patient Management Tool™ (PMT). See Get With The Guidelines® coding instructions for definitions.**

- **DTD Time data feedback provided**

**How patient arrived at your hospital:**
- Direct Presentation
- Transfer

**Patient Care Team Members**

Patient time tracker sheets are valuable quality improvement tools. Using time tracker sheets raises stroke team members’ awareness of DTN time. Reviewing sheets can help identify problem areas or aid in spotting patterns to target for process change.

Geriatric is a National Supplier of the American Heart Association’s Target Stroke – Phase III

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**TIME LOST IS BRAIN LOST. Learn more at heart.org/targetstroke.**

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Appendix G2: Sample Stroke Code Case Review Form

Stroke Code Feedback Form

Date

Name/DOB
MRN

Age/Gender

Mode of Arrival
ANW

STROKE code staff

ER Physician

ER Nurse

Stroke Code Components

Arrival time/mode OSH

Stroke Code called/time

"UKW" documented/time

NIHSS score

BG documented/time

Weight documented/time

50cc NS bag documented after tPA administered

<table>
<thead>
<tr>
<th>Door to MD Assess/order</th>
<th>Door to One Call/Neuro Teleconnect</th>
<th>Door to CT Scan</th>
<th>Door to tPA order</th>
<th>Door to INR Results if applicable</th>
<th>Door to tPA Administered</th>
<th>Door to dc from OSH</th>
<th>NIHSS et dc from ANW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Time: &lt; 10 mins</td>
<td>Goal Time: &lt; 10 mins</td>
<td>Goal Time: &lt; 10 mins</td>
<td>Goal Time: &lt; 35 mins</td>
<td>Goal Time: &lt; 40 mins</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pt Scenario:

Opportunities:

STROKE CODE Follow Up:
Appendix G3: Sample Tracking PI Project Form

<table>
<thead>
<tr>
<th>PI Project Form</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Department/Service Area:</strong></td>
<td>Emergency Department/Radiology</td>
</tr>
</tbody>
</table>
| **Problem/Indicator:** | Stroke code activations door to CT metric.  
Goal time for door to CT is 25 minutes.  
Average time for door to CT is currently 30 minutes.  
40% of stroke code activations are within goal time for door to CT metric. |
| **Goal:** | Decrease average door to CT for stroke code activations to 20 minutes or less resulting in higher percentage within goal time. |
| **Study Timeframe:** | Start: 01/07/2019  
End: 03/04/2019 |
| **Actions:** EMS stroke code activations that are stable will stay on the EMS cot and go straight to CT.  
Private vehicle arrivals will be triaged quickly. Once stroke code activated they will be transported straight to CT instead of roomed. | **Outcome:** EMS stroke code arrivals will see a decrease in door to CT time to average 15 minutes or less. 80% of EMS arrivals will be within goal.  
Private vehicle stroke code activations will achieve a decrease in door to CT time to average 15 minutes or less. 80% of private vehicle arrivals will be within goal.  
**Plan:** Data to track/evaluate: Door to CT for overall stroke code activations, % within goal time, door to CT for EMS arrivals, door to CT for private vehicle arrivals.  
Data to track/evaluate: Door to CT for overall stroke code activations, % within goal time, door to CT for EMS arrivals, door to CT for private vehicle arrivals.  
Review above outcome data at Stroke committee meeting on 04/08/2019.  
Include successes and barriers.
Appendix H: Sample Stroke Specific Transfer Protocol

Saint Elizabeth's Medical Center
MINISTRY HEALTH CARE

PROTOCOL: Transfer of the stroke patient

New: 3/15/17 Reviewed:

PURPOSE:
To quickly and correctly identify and stabilize patients who will require transfer to a tertiary stroke center for definitive management.

INDICATIONS/PROTOCOL:

Stroke patients will require evaluation by the emergency department providers and consultation with a stroke neurologist at the receiving stroke center before the decision to transfer is made.

Once the decision to transfer has been made, it should not be delayed. At this point, focus of the emergency department staff is on treatment with t-PA (if appropriate) and stabilization with the goal of minimizing the patient's length of stay in the emergency to less than 2 hours.

Early consideration should be given to method of transfer. Ground transport can be used if the patient is not an air transport candidate or if the air transport cannot fly. All patient's must be transferred under the care of personnel who are adequately trained to manage a stroke victim.

PROCEDURE:

1. After becoming aware of a stroke code patient, who will likely require emergent transfer, is en route, the emergency department staff activated the stroke code team.
2. The provider identifies and contacts the receiving facility physician to accept transfer. They should discuss the physiological status of the patient, further testing or treatments to be done prior to the transfer and the optimal timing of transfer.
3. The provider identifies the appropriate mode of transport (air versus ground) and qualifications of the transport personnel.
4. Nursing staff arranges for transport then calls to give nurse to nurse at the receiving facility and approximated arrival time to the receiving facility.
5. Nursing asks Radiology to push scan to D-reads if going to Mayo at Rochester or asks a CD of the scan be made to send with the patient. Labs, preliminary radiology reports, documentation are either sent with the patient or faxed.
6. Prior to dismantling the team a review of case, what went right and what did not go right.

TH/Stroke folder 3/17
Appendix H1: Sample MOA

MEMORANDUM OF AGREEMENT

THIS MEMORANDUM OF AGREEMENT (the “MOA”) is made and entered into as of March 28, 2018 between Allina Health System, dba Regina Hospital and Allina Health System, dba United Hospital.

A. PARTIES. The parties in this agreement are Allina Health System, dba Regina Hospital, an Acute Stroke Ready Hospital and Allina Health System, dba United Hospital, a DNV-GL Certified Comprehensive Stroke Center with 24/7 neurosurgery and endovascular capabilities.

B. PURPOSE. This MOA is a voluntary agreement among the hospitals that establishes an agreement for transfer for stroke patients requiring neurosurgical evaluation or endovascular evaluation and/or treatment.

C. AGREEMENTS. Allina Health System, dba Regina Hospital agrees to perform neurological assessment and diagnostic procedures to determine neurosurgical or endovascular intervention eligibility according to current guidelines. Allina Health System, dba Regina Hospital agrees to established transfer protocol to access neurosurgical or endovascular consultation with Allina Health System, dba United Hospital, including, but not limited to:

1. Consultation through telestroke or phone consult as an initial point of contact.
2. Providers from both hospitals discuss physiological status of the patient and decide on the appropriate medical procedures and mode of transfer (air or ground).
3. Allina Health System, dba Regina Hospital contacts Allina Health System, dba United Hospital for transfer through the Allina Health System, dba United Hospital Patient Placement priority line at 651-241-4700 and determines the appropriate aero medical or ground transportation and obtains an estimated time of arrival.
4. Allina Health System, dba Regina Hospital makes copies of all available documentation to accompany the patient (examples include the EMS run sheet, CT scans, and lab results).

D. TRANSFER PROTOCOL. An Interfacility Transfer Agreement supplements this MOA.

E. TERMS. The term of this agreement is for three (3) years, commencing on date of final signature. Either party may terminate this relationship, with or without cause, upon fifteen (15) days written notice to the other party.

REMAINDER OF THIS PAGE LEFT INTENTIONALLY BLANK
Accepted and agreed to by:

Allina Health System, dba Regina Hospital

By: __________________________
Name: __________________________
Title: __________________________
Date: __________________________

Allina Health System, dba United Hospital

By: __________________________
Print: __________________________
Name: __________________________
Title: __________________________
Date: __________________________
Appendix I: Stroke Leadership Letter

This is a letter on hospital letterhead, co-signed by the CEO, designated Stroke Medical Director, and designated Stroke Coordinator. This needs to state that each person agrees to serve in the capacity for the hospital.
Acute Stroke Ready Hospital Designation Checklist

Use this checklist to organize your documents to ensure that you have considered all relevant materials to submit a complete application.

✓ **Activation Log as evidence of Acute Stroke Team availability 24/7**

- Activation log: complete with the last years activations. Log to include - Activation Date and Time, Time of AST response, Diagnosis, Treatment, and Final Diagnosis.

✓ **Written stroke protocols or algorithms for acute treatment in the ED**

- **Protocol that reflects ED process for stroke**
  - Roles and Responsibilities of AST staff
  - Time goals [Door to Provider, Door to Telestroke, Door to CT, Door to CT read, Door to Needle, Door to Door (Transfer out)]
  - Time Frame for Activation/ Clock Time Last Known Well
  - Symptoms and criteria for Activation
  - Labs (glucose, coags, etc.)
  - IV access
  - Vitals and BP parameters and BP meds
  - NIHSS/Neuro assessment
  - Non-contrast Head CT (do you also provide CTA? Add this into narrative/protocol/algorithm)
  - Consultation with Neurology/Tele-stroke
  - Consideration of treatment by times from last known well (consideration of alteplase, endovascular, hemorrhage)
  - Inclusion/Exclusion criteria for alteplase
  - Alteplase dosing and administration (accurate weights)
  - Post-alteplase management and consideration of complications
  - Endovascular consideration

- **Algorithm that depicts stroke code process**
- **Protocol/policy for inpatient stroke code**
- **Inclusion/Exclusion criteria**
- **Order sets** to support protocol/algorithm
- **ED order sets** (ischemic with/without alteplase, which include the initial work-up and management of stroke) to include at a minimum the following:
  - Weights
  - Vital signs and neuro checks
  - BP parameters (Notify MD if BP >220/120, if alteplase candidate >185/110)
  - Pre-checked labs
  - Radiology orders
  - Dysphagia screen/order for strict NPO until screened
  - IV access
- **Alteplase order set** and/or supporting documentation (this can be included in above order set)
  - Alteplase Dosing and administration instructions (bolus and infusion)
• Patient monitoring during and after alteplase infusion
  ▪ Vital signs and neuro checks
  ▪ BP parameters during infusion and meds
  ▪ Complications to monitor for and actions to take if they occur
  ▪ Avoid antiplatelets, anticoagulants, IV starts, etc.
  ▪ Transfer (if not admitted)

• For those who admit IV alteplase patients:
  ▪ **Letter** describing the circumstances when you will admit an alteplase patient, signed by the stroke coordinator.
  ▪ **Admission order sets for stroke with alteplase** (only if your hospital routinely keeps patients who have received IV alteplase).
    ▪ Vital signs and neuro assessments
    ▪ BP parameter and BP meds
    ▪ Imaging - CT/CTA, MRI/MRA, CUS, echocardiogram, TEE
    ▪ Labs
    ▪ Dysphagia screening
    ▪ Core measure related orders
    ▪ PT/OT/SLP
    ▪ Meds - ASA, Plavix, statins
    ▪ Stroke education
    ▪ Cardiac monitoring
    ▪ When to call the provider
  ▪ **Dysphagia screening protocol**

✓ **EMS**

• EMS stroke protocol

*Optional:* Interfacility Transport Protocol for Alteplase Patients (Drip and Ship)

✓ **Education**

• A detailed table of the stroke education plan for the next three years with estimated date, staff targeted (AST) and expected educational hours. Locums and casual providers should also be included if used at your facility.

• Onboarding education for new hires is required to be included in the education plan.

• For locum providers or casual providers it is acceptable to use an attestation letter completed by the provider detailing the date and stroke education completed elsewhere.
✓ **Lab**

- **Scope of Service** showing 24/7 availability - including on-call response times. If missing from SOS, attach a letter from laboratory co-signed by coordinator.
- **STAT labs** reflected in order set

✓ **Radiology**

- **Scope of Service** that contains the below. If missing from SOS, attach a letter from radiology co-signed by coordinator to describe following:
  - CT tech on site or on call, specify hours, specify expected response time when called in
  - Radiologist on site or teleradiology, specify hours, specify expected turnaround time (read back) for stroke
  - STAT read for stroke (can be in order sets)

✓ **PI**

- **Evidence of data collection** – Reports should be from 2017 to current date and uploaded into your application.
  - Door to stroke team activation
  - Door to provider
  - Door to telestroke activation
  - Door to imaging initiated
  - Door to imaging read
  - Door to needle
  - Door in door out

  You may provide this information in another format.

- **Evidence of utilization of data for performance improvement.** Upload projects around performance improvement efforts. This may include action plans, data tracking sheets, meeting minutes, and results.
- **Upload Stroke Committee Meeting agendas and meeting minutes** from the last year.
- **Upload case review or feedback forms.**

✓ **Transfer agreements**

- **Protocol or algorithm** that describes how you prepare a patient to transfer out of your ED. Must contain:
  - Phone number to call for transfer to next level of care (transfer center or similar at receiving facility – if you commonly transfer to more than one facility, include contact information for each)
  - Who makes decisions on air vs ground transport
  - Phone number to call for EMS (or who contacts them if done by receiving facility)
- Handoff to EMS: Consideration of tubing and pump exchange if sending with alteplase infusion
- Consideration of how to get records to next hospital (if no shared electronic health record, which records/imaging is sent?)
- Report to next facility

- MOA or transfer agreement
  - Stroke-specific, including mechanical thrombectomy and neurosurgical capabilities
  - Signed by CEO or designee of both hospitals
  - Must be active

- **Stroke Leadership**
  - Letter co-signed by CEO, stroke coordinator and stroke medical provider, attesting to roles
  - Stroke coordinator and medical director must have some time on-site to manage stroke program.
  - MD should be on-site and can have medical direction provided through telestroke with engaged case review.