2023 North Dakota Cardiac and Stroke Conference

October 25-26, 2023

Cardiac and Stroke Systems of Care Updates

Christine Greff, BSN, RN, SCRN
Emergency Medical Systems Unit

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American Heart Association.

Cardiac System of Care

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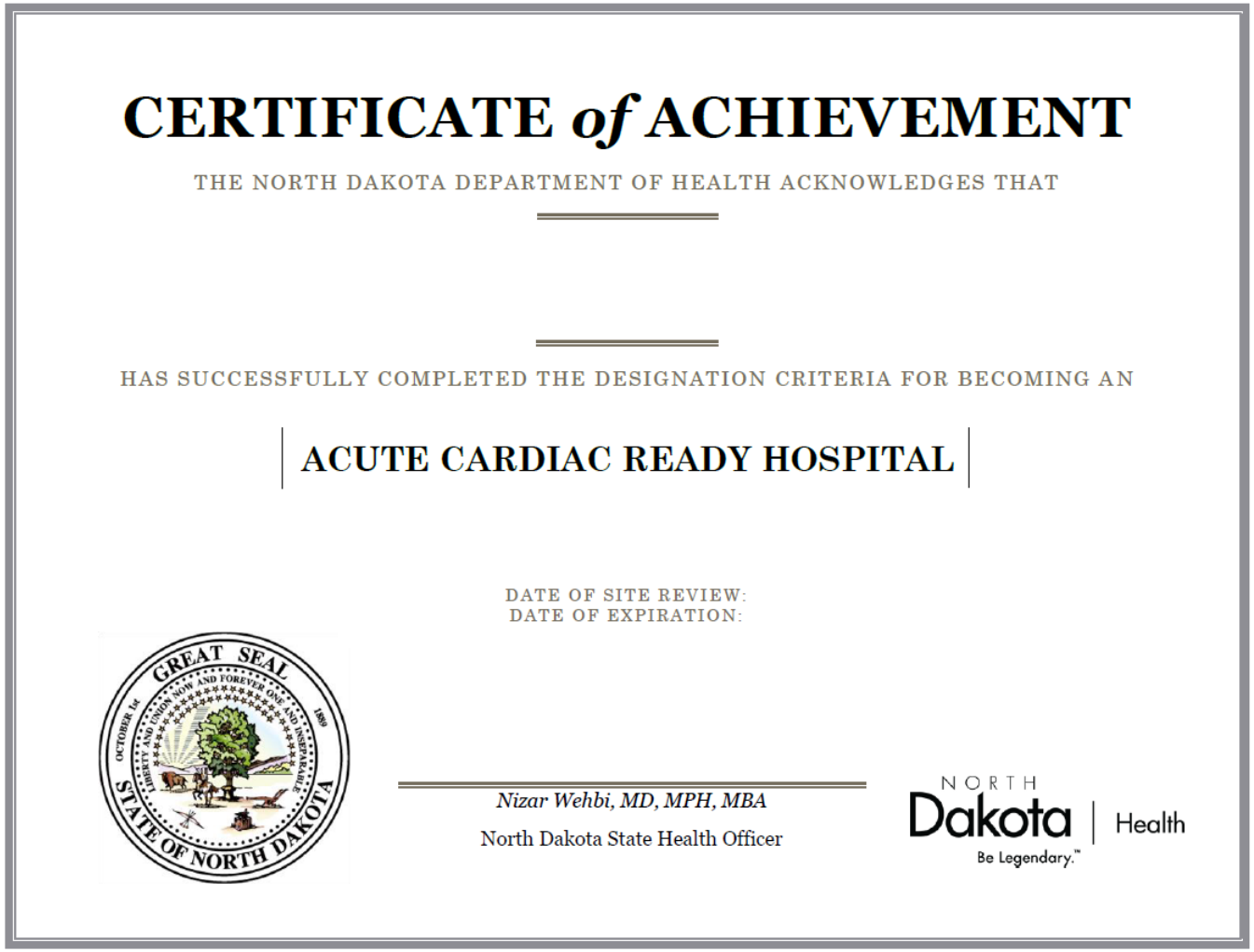
Acute Cardiac Ready (ACRH) Hospital Designation

It's as easy as 1, 2, 3…

1. Enroll and contribute to the state cardiac registry, GWTG- CAD
2. Meet established ACRH designation criteria
3. Apply to be designated as a STEMI referring center by the state



CERTIFICATE *of* ACHIEVEMENT

THE NORTH DAKOTA DEPARTMENT OF HEALTH ACKNOWLEDGES THAT

HAS SUCCESSFULLY COMPLETED THE DESIGNATION CRITERIA FOR BECOMING AN

ACUTE CARDIAC READY HOSPITAL

DATE OF SITE REVIEW:
DATE OF EXPIRATION:

Nizar Wehbi, MD, MPH, MBA
North Dakota State Health Officer

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ACRH Hospital Designation Benefits

- Designated by the state as a STEMI referring center
- Get recognized for your exceptional STEMI care
- Involvement in education and outreach
- Guidance on best practice STEMI treatment
- Contribute to the collection of statewide STEMI data
- Participate in statewide performance improvement

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Statewide Cardiac Registry FAQ

- What registry was chosen?
- What is the purpose?
- Is participation mandatory?
- How do I share data if I use a different registry?
- How is the registry paid for?

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Stroke System of Care

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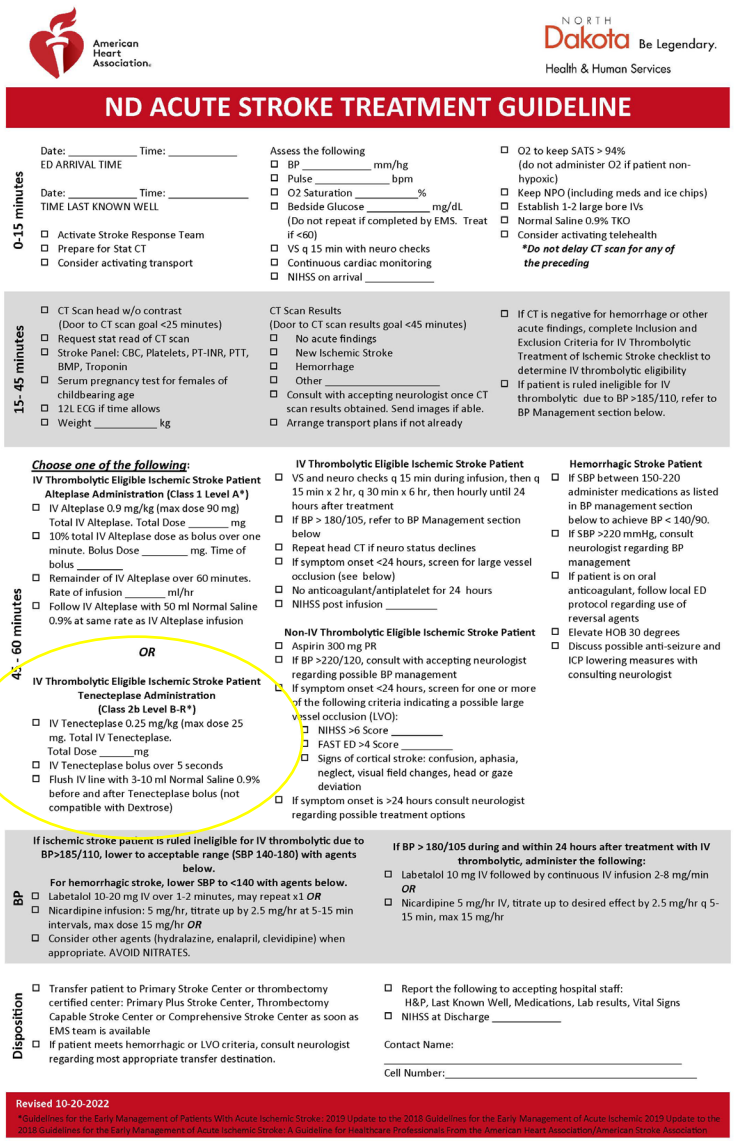
North Dakota Acute Stroke Treatment Guidelines

- Updated to include the option of giving Tenecteplase in stroke
- The Stroke Task Force recommends utilization of one thrombolytic for stroke treatment
- If you are making the transition to Tenecteplase, please utilize the Tenecteplase Transition Resource



American Heart Association.

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ND ACUTE STROKE TREATMENT GUIDELINE

0-15 minutes

Date: _____ Time: _____
ED ARRIVAL TIME

Date: _____ Time: _____
TIME LAST KNOWN WELL

- ☐ Activate Stroke Response Team
- ☐ Prepare for Stat CT
- ☐ Consider activating transport

Assess the following
- ☐ BP _____ mm/hg
- ☐ Pulse _____ bpm
- ☐ O2 Saturation _____%
- ☐ Bedside Glucose _____ mg/dL (Do not repeat if completed by EMS. Treat if <60)
- ☐ VS q 15 min with neuro checks
- ☐ Continuous cardiac monitoring
- ☐ NIHSS on arrival _____

- ☐ O2 to keep SATS > 94% (do not administer O2 if patient non-hypoxic)
- ☐ Keep NPO (including meds and ice chips)
- ☐ Establish 1-2 large bore IVs
- ☐ Normal Saline 0.9% TKO
- ☐ Consider activating telehealth

Do not delay CT scan for any of the preceding

15- 45 minutes

- ☐ CT Scan head w/o contrast (Door to CT scan goal <25 minutes)
- ☐ Request stat read of CT scan
- ☐ Stroke Panel: CBC, Platelets, PT-INR, PTT, BMP, Troponin
- ☐ Serum pregnancy test for females of childbearing age
- ☐ 12L ECG if time allows
- ☐ Weight _____ kg

CT Scan Results
(Door to CT scan results goal <45 minutes)
- ☐ No acute findings
- ☐ New Ischemic Stroke
- ☐ Hemorrhage
- ☐ Other _____
- ☐ Consult with accepting neurologist once CT scan results obtained. Send images if able.
- ☐ Arrange transport plans if not already

- ☐ If CT is negative for hemorrhage or other acute findings, complete Inclusion and Exclusion Criteria for IV Thrombolytic Treatment of Ischemic Stroke checklist to determine IV thrombolytic eligibility
- ☐ If patient is ruled ineligible for IV thrombolytic due to BP >185/110, refer to BP Management section below.

45 - 60 minutes

Choose one of the following:

IV Thrombolytic Eligible Ischemic Stroke Patient Alteplase Administration (Class 1 Level A*)
- ☐ IV Alteplase 0.9 mg/kg (max dose 90 mg) Total IV Alteplase. Total Dose _____ mg
- ☐ 10% total IV Alteplase dose as bolus over one minute. Bolus Dose _____ mg. Time of bolus _____
- ☐ Remainder of IV Alteplase over 60 minutes. Rate of infusion _____ ml/hr
- ☐ Follow IV Alteplase with 50 ml Normal Saline 0.9% at same rate as IV Alteplase infusion

OR

IV Thrombolytic Eligible Ischemic Stroke Patient Tenecteplase Administration (Class 2b Level B-R*)
- ☐ IV Tenecteplase 0.25 mg/kg (max dose 25 mg. Total IV Tenecteplase. Total Dose _____mg
- ☐ IV Tenecteplase bolus over 5 seconds
- ☐ Flush IV line with 3-10 ml Normal Saline 0.9% before and after Tenecteplase bolus (not compatible with Dextrose)

IV Thrombolytic Eligible Ischemic Stroke Patient
- ☐ VS and neuro checks q 15 min during infusion, then q 15 min x 2 hr, q 30 min x 6 hr, then hourly until 24 hours after treatment
- ☐ If BP > 180/105, refer to BP Management section below
- ☐ Repeat head CT if neuro status declines
- ☐ If symptom onset <24 hours, screen for large vessel occlusion (see below)
- ☐ No anticoagulant/antiplatelet for 24 hours
- ☐ NIHSS post infusion _____

Non-IV Thrombolytic Eligible Ischemic Stroke Patient
- ☐ Aspirin 300 mg PR
- ☐ If BP >220/120, consult with accepting neurologist regarding possible BP management
- ☐ If symptom onset <24 hours, screen for one or more of the following criteria indicating a possible large vessel occlusion (LVO):
  - ☐ NIHSS >6 Score _____
  - ☐ FAST ED >4 Score _____
  - ☐ Signs of cortical stroke: confusion, aphasia, neglect, visual field changes, head or gaze deviation
- ☐ If symptom onset is >24 hours consult neurologist regarding possible treatment options

Hemorrhagic Stroke Patient
- ☐ If SBP between 150-220 administer medications as listed in BP management section below to achieve BP < 140/90.
- ☐ If SBP >220 mmHg, consult neurologist regarding BP management
- ☐ If patient is on oral anticoagulant, follow local ED protocol regarding use of reversal agents
- ☐ Elevate HOB 30 degrees
- ☐ Discuss possible anti-seizure and ICP lowering measures with consulting neurologist

BP

If ischemic stroke patient is ruled ineligible for IV thrombolytic due to BP>185/110, lower to acceptable range (SBP 140-180) with agents below.
For hemorrhagic stroke, lower SBP to <140 with agents below.
- ☐ Labetalol 10-20 mg IV over 1-2 minutes, may repeat x1 ***OR***
- ☐ Nicardipine infusion: 5 mg/hr, titrate up by 2.5 mg/hr at 5-15 min intervals, max dose 15 mg/hr ***OR***
- ☐ Consider other agents (hydralazine, enalapril, clevidipine) when appropriate. AVOID NITRATES.

If BP > 180/105 during and within 24 hours after treatment with IV thrombolytic, administer the following:
- ☐ Labetalol 10 mg IV followed by continuous IV infusion 2-8 mg/min ***OR***
- ☐ Nicardipine 5 mg/hr IV, titrate up to desired effect by 2.5 mg/hr q 5-15 min, max 15 mg/hr

Disposition
- ☐ Transfer patient to Primary Stroke Center or thrombectomy certified center: Primary Plus Stroke Center, Thrombectomy Capable Stroke Center or Comprehensive Stroke Center as soon as EMS team is available
- ☐ If patient meets hemorrhagic or LVO criteria, consult neurologist regarding most appropriate transfer destination.

- ☐ Report the following to accepting hospital staff: H&P, Last Known Well, Medications, Lab results, Vital Signs
- ☐ NIHSS at Discharge _____

Contact Name: _____
Cell Number: _____

Revised 10-20-2022

*Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

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Tenecteplase Transition Resource

Tenecteplase Kit for Acute Ischemic Stroke

Kit Contents:

1 – Tenecteplase 50 mg vial
1 – Preservative Free Sterile Water 10 mL vial
2 – Alcohol swabs
1 – 10 mL syringe for dilution
2 – Needleless Med Prep Cannula
1 – 5 mL syringe for administration
1 – Tenecteplase Stroke Dilution, Dosing & Admin Card
1 – Label for Tenecteplase Stroke syringe bolus

eplase Dilution, Dosing & Admin Information

Acute Ischemic Stroke

uctions:
50 mg vial with 10 mL preservative free sterile water to = 5 mg/mL
L GENTLY - DO NOT SHAKE.

m dose calculation with dose on MAR
Dose: 0.25 mg/kg (actual body weight)
num Dose = 25 mg

ple Dose Calculation: 70 kg patient: 70 kg x 0.25 mg/kg = 17.5 mg, $\frac{17.5\ mg}{5\ mg/mL} = 3.5\ mL$

Calculation: ____kg patient: ____kg x 0.25 mg/kg = ____mg (max dose 25 mg)

e to draw up in 5 mL syringe: $\frac{mg}{5\ mg/mL} = \_\_\_\_\ mL$

Chart for Double Check

Patient Weight (kg)	DOSE RANGE Tenecteplase dose (mg) in this weight range	VOLUME RANGE Volume Tenecteplase to be administered (mL)
60 kg or less	15 mg or less	3 mL or less
61 kg to 70 kg	15.5 - 17.5 mg	3.1 - 3.5 mL
71 kg to 80 kg	18 - 20 mg	3.6 - 4 mL
81 kg to 90 kg	20.5 - 22.5 mg	4.1 - 4.5 mL
91 kg or greater	23 - 25 mg	4.6 - 5 mL

Administration:

- DOSE IS NEVER the FULL Vial - Do **NOT** administer entire contents of vial
- Flush line with 10 mL 0.9% Sodium Chloride before & after administration
- Administer IV Push over 5 seconds

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Transition to Tenecteplase Checklist

- ☐ Involve all stakeholders. This should include pharmacy, providers, stroke program leadership, and administration
- ☐ Determine if this is a feasible change for your facility--the decision to switch is determined by your facility and providers*
- ☐ Consider following the State recommendations on dosing of Tenecteplase in stroke
- ☐ Develop a Tenecteplase order set
- ☐ Update all current stroke protocols and resources
- ☐ Develop education/competency check off for nursing, pharmacy, and providers
- ☐ Develop process to safely differentiate stroke and MI Tenecteplase dosing
- ☐ Set a timeline (Do not be afraid to extend timeline to ensure safe transition)
- ☐ Develop education for patients

Transition Tips

- ✓ Consider making a full transition to Tenecteplase rather than alternating between Tenecteplase and Alteplase
- ✓ Medication safety is the priority--utilize Tenecteplase rather than TNK or TNKase to avoid confusion with tPA or TXA
- ✓ Do not underestimate the number of places Alteplase verbiage can be found
- ✓ Share updated acute stroke order set with telemedicine services
- ✓ Update dot phrases and downtime forms with new order sets and protocols
- ✓ Be mindful that Tenecteplase cannot be exchanged if premixed and not administered

*The transition to Tenecteplase is a facility specific choice. The North Dakota Stroke Task Force does not endorse the use of one thrombolytic over the other.

1/2023

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STROKE LITERATURE

- Guidelines for the Early Management of Patients with Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke
- Tenecteplase Thrombolysis for Acute Ischemic Stroke

DOSING

Tenecteplase dose for **STROKE** is 0.25mg/kg (actual body weight) with a **MAXIMUM DOSE** of **25 mg**

- IV push over five seconds
- Not compatible with any dextrose containing solutions
- Flush IV with Normal Saline before and after Tenecteplase administration
- You will never administer a full vial to treat stroke
- The stroke dosage is NOT listed on the box

INCLUSION/EXCLUSION CRITERIA

Please refer to the ND Inclusion and Exclusion Criteria for IV Thrombolytic Treatment of Ischemic Stroke

COMPLICATIONS

- Oral Angioedema
- Hemorrhagic Transformation
- Systemic Bleeding

REVERSAL

If the patient experiences hemorrhage post-Tenecteplase administration, follow the Neurocritical Care Society and the Society of Critical Care Medicine Guidelines for reversal of thrombolytics:

- Cryoprecipitate 10 units IV

If Cryoprecipitate is contraindicated or unavailable, administer:

- Tranexamic acid 10 to 15 mg/kg IV push over 20 minutes

OR

- Aminocaproic acid 4 to 5 mg IV

MONITORING

-Vital signs and neuro checks every 15 minutes x 2 hours, every 30 minutes x 6 hours, then hourly until 24 hours after treatment

-If blood pressure is greater than 180/105, notify provider

-Repeat head CT if neuro status declines

-NIHSS – Post administration and with any neuro changes

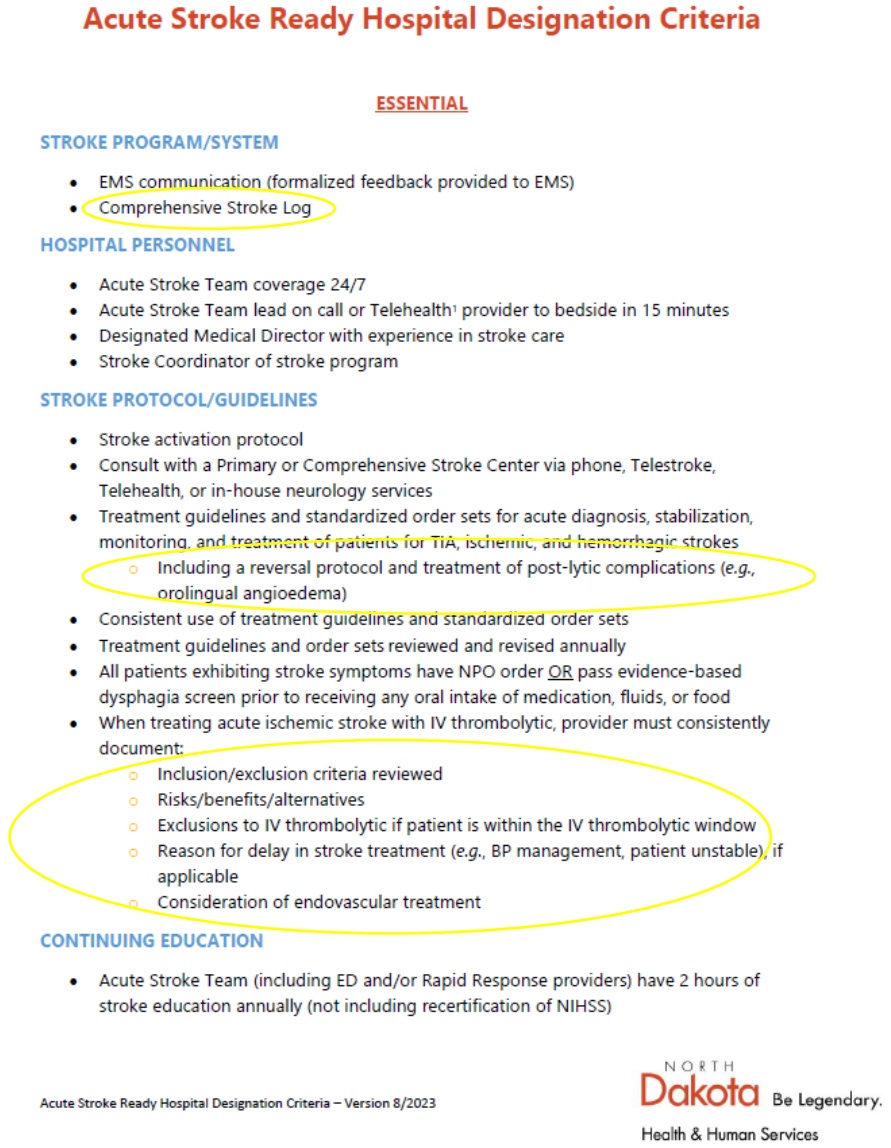
-No anticoagulant/antiplatelet for 24 hours

-Monitor for complications

2024 Acute Stroke Ready Hospital Designation Criteria

Essential updates include:

- Comprehensive stroke log
- Protocol for reversal and treatment of post-lytic complications
- Provider documentation requirements



Acute Stroke Ready Hospital Designation Criteria

ESSENTIAL

STROKE PROGRAM/SYSTEM

- EMS communication (formalized feedback provided to EMS)
- Comprehensive Stroke Log

HOSPITAL PERSONNEL

- Acute Stroke Team coverage 24/7
- Acute Stroke Team lead on call or Telehealth[1] provider to bedside in 15 minutes
- Designated Medical Director with experience in stroke care
- Stroke Coordinator of stroke program

STROKE PROTOCOL/GUIDELINES

- Stroke activation protocol
- Consult with a Primary or Comprehensive Stroke Center via phone, Telestroke, Telehealth, or in-house neurology services
- Treatment guidelines and standardized order sets for acute diagnosis, stabilization, monitoring, and treatment of patients for TIA, ischemic, and hemorrhagic strokes
  - Including a reversal protocol and treatment of post-lytic complications (*e.g.*, orolingual angioedema)
- Consistent use of treatment guidelines and standardized order sets
- Treatment guidelines and order sets reviewed and revised annually
- All patients exhibiting stroke symptoms have NPO order OR pass evidence-based dysphagia screen prior to receiving any oral intake of medication, fluids, or food
- When treating acute ischemic stroke with IV thrombolytic, provider must consistently document:
  - Inclusion/exclusion criteria reviewed
  - Risks/benefits/alternatives
  - Exclusions to IV thrombolytic if patient is within the IV thrombolytic window
  - Reason for delay in stroke treatment (*e.g.*, BP management, patient unstable), if applicable
  - Consideration of endovascular treatment

CONTINUING EDUCATION

- Acute Stroke Team (including ED and/or Rapid Response providers) have 2 hours of stroke education annually (not including recertification of NIHSS)

Acute Stroke Ready Hospital Designation Criteria – Version 8/2023

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2024 Acute Stroke Ready Hospital Designation Criteria

Essential updates include:

- Written CT downtime protocol
- Utilization of clinical practice guidelines blood pressure management medications
- Comprehensive performance improvement program and up to date with data submission (within 90 days)

- All AST members performing National Institute of Health Stroke Scale (NIHSS) must be NIHSS certified
- Orientation of new staff (including travelers and locums) to include stroke code process and protocols

LABORATORY

- Available 24/7
- Basic blood tests
- Coagulation studies

DIAGNOSTIC IMAGING

- Diagnostic radiology staff available 24/7
- Brain imaging with non-contrast CT
- 12 lead ECG (not to delay stroke treatment)
- Written CT downtime protocol

MEDICATIONS

- IV thrombolytic available 24/7 (Alteplase or Tenecteplase)[3]
- First-line antihypertensive medications available 24/7
- Utilize clinical practice guidelines blood pressure management medications including Labetalol, Hydralazine, Nicardipine

PERFORMANCE IMPROVEMENT PROGRAM

- Participation in North Dakota State Stroke Registry
- Comprehensive quality improvement program that tracks quality metrics, identifies opportunities for improvement, provides formal feedback to staff, and develops action plans to improve practice
- Data submission into stroke registry current (90 days prior to the site visit)
- Performance Improvement Program
  - Must include, but is not limited to, tracking the following metrics:
    - Pre-notification by EMS
    - Documentation of LKW
    - Initial NIHSS reported
    - Door to CT initiation <25 min
    - Door to CT Interpretation <45 minutes
    - Dysphagia Screen
    - IV thrombolytic arrive in 2 treat in 3
    - IV thrombolytic arrive in 3.5 treat in 4.5
    - Door to Needle <60 min
    - Door to Transfer to another hospital time reported (median time)
- Review of hospital and pre-hospital stroke care

Acute Stroke Ready Hospital Designation Criteria – Version 8/2023

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2024 Acute Stroke Ready Hospital Designation Criteria

Recommended updates include:

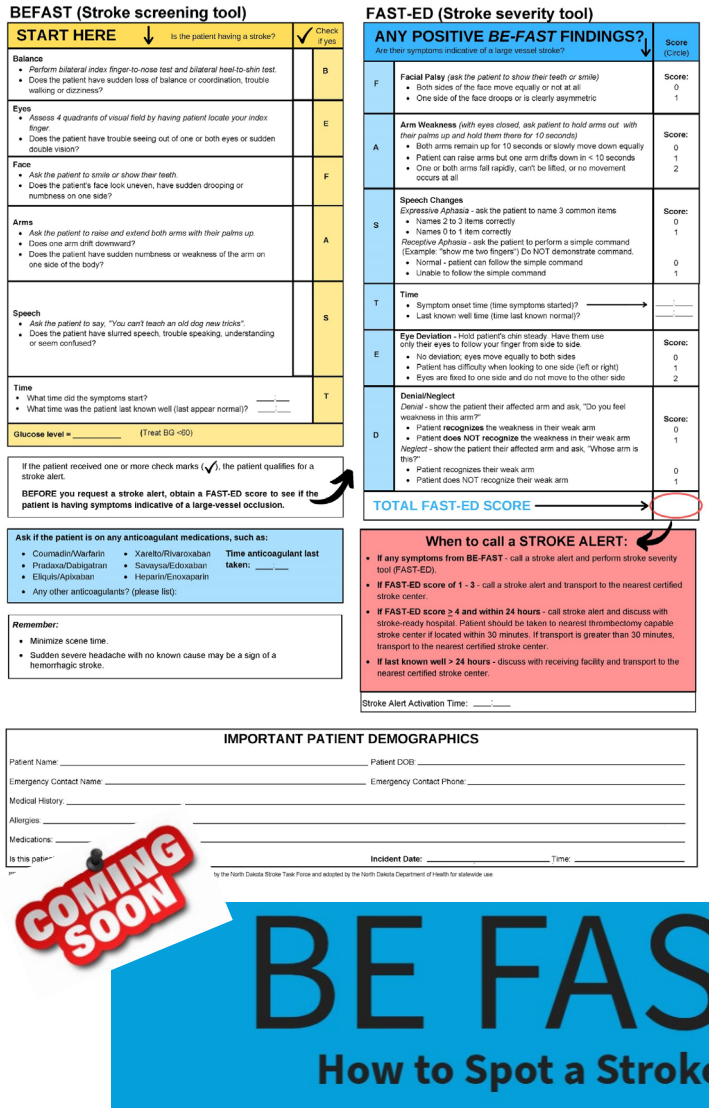
- Utilization of telehealth services to assist with management of stroke code
- BEFAST education provided to all staff
- Community outreach on stroke recognition and activation of the emergency response system
- Subacute stroke care resource awareness

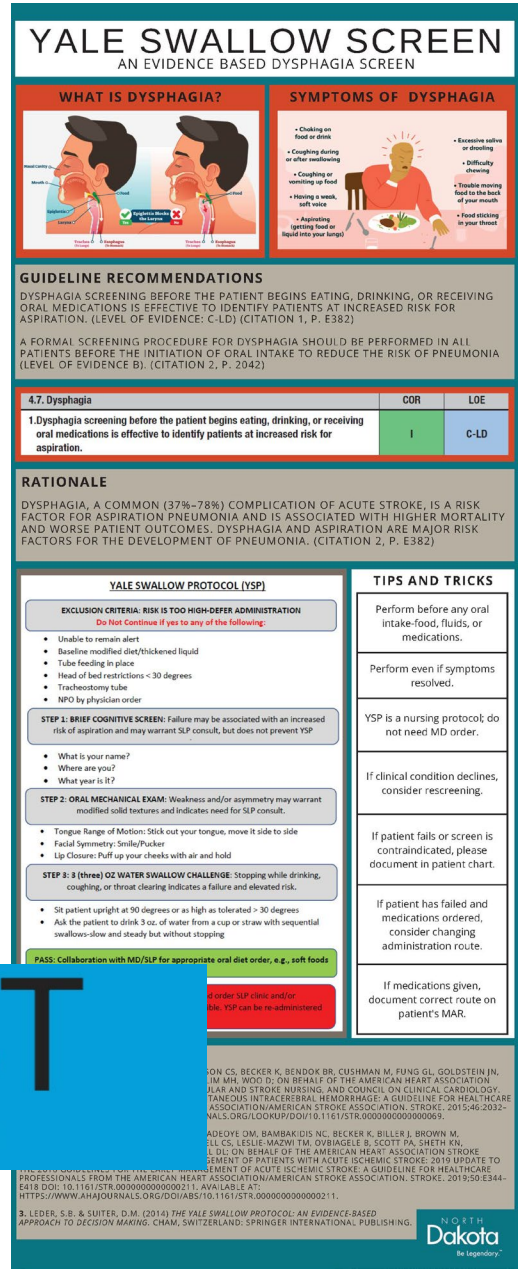
Performance Improvement

The Stroke System of Care collects statewide data on determined quality measures. We then analyze the data, identify areas of improvement, and develop a plan to improve outcomes.

- BEFAST/FAST-ED Algorithm
- Dysphagia Screen Infographic
- Public Facing BEFAST Poster (coming soon)

STROKE SCREENING TOOLS:





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Cardiac Ready Community Program

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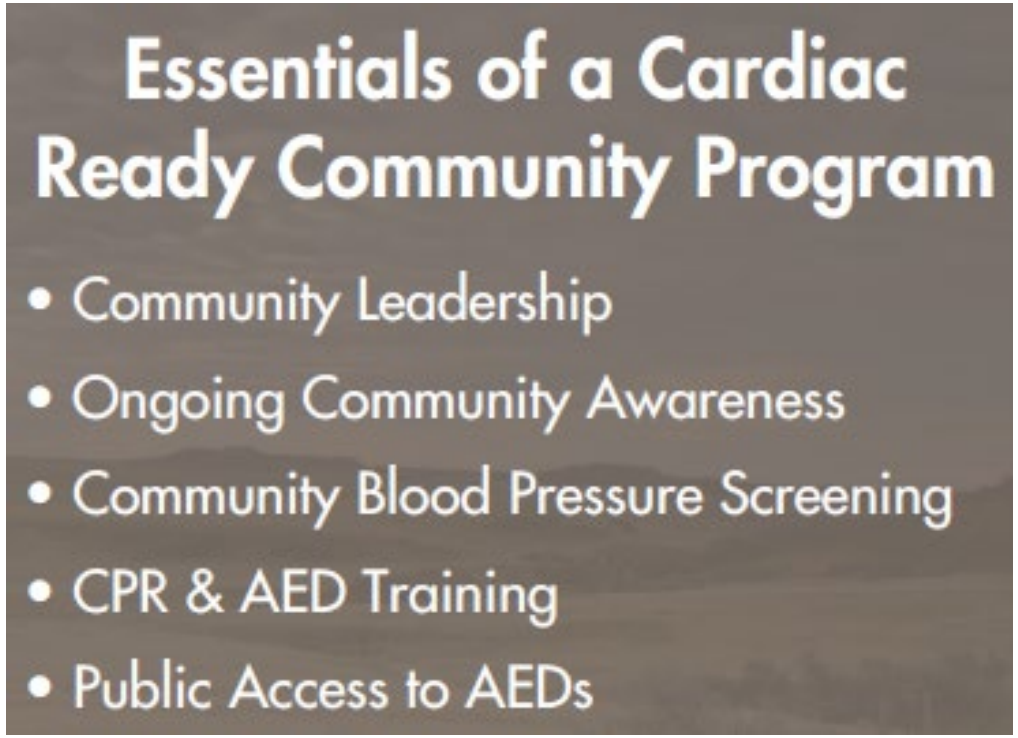
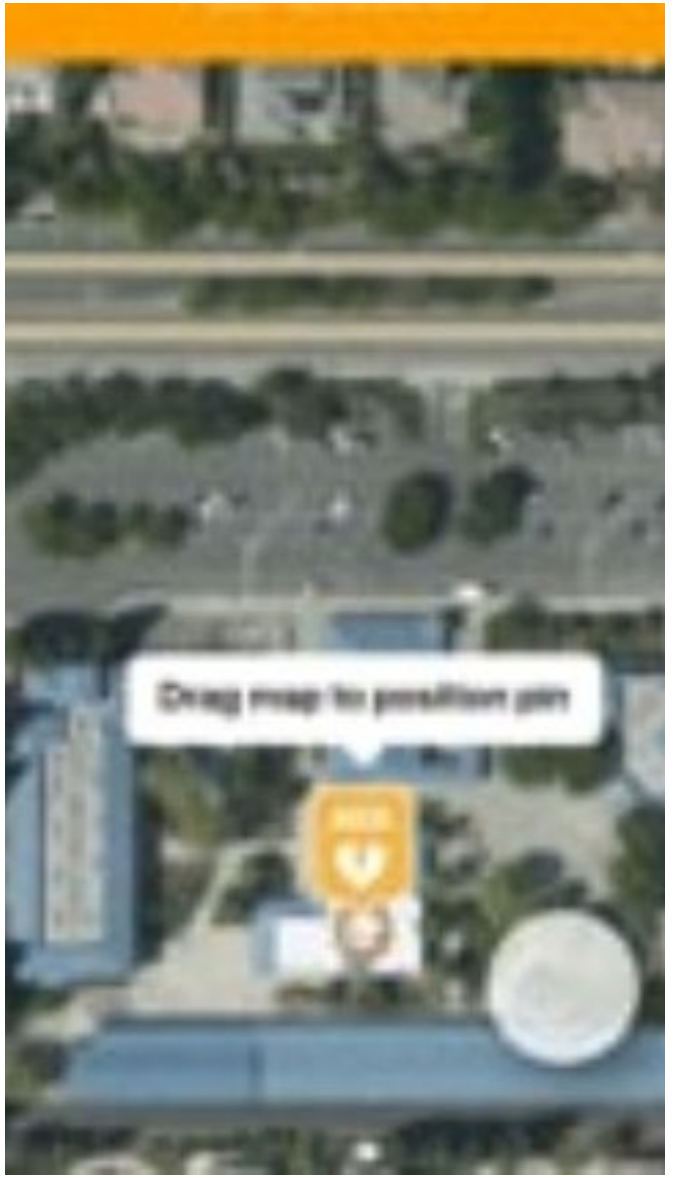
Cardiac Ready Community Program

Designed to promote survival from a cardiac event, such as sudden cardiac arrest outside of the hospital setting (OHCA). The goal is to prepare community members to recognize, respond, and assist with cardiovascular emergencies. The CRC Community program promotes the American Heart Association Chain of Survival, which can improve the chances of survival and recovery for heart attack, stroke, or sudden cardiac arrest victims.



PulsePoint AED Registry

- In the revised Cardiac Ready Community Guidelines, one designation criterion under the Public Access to AEDs section is to enter AEDs in your community into the free PulsePoint AED application.
- The application is free, easy to use, and enables you to build an AED registry for your community. Making it easier to find an AED when a cardiac emergency strikes.
- AEDs managed using the PulsePoint AED application are accessible to emergency dispatchers, including nearby citizens trained in CPR and off-duty professionals.



North Dakota Law Enforcement AED Project

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The Helmsley Charitable Trust

- In 2020, a grant from the Helmsley Charitable Trust awarded the North Dakota Department of Health and Human Services $4.3 million dollars to equip law enforcement first responders statewide with the next generation “connected” Automated External Defibrillators (AEDs).
- Over 1,600 devices have been distributed to local, state, tribal, and federal law enforcement agencies.

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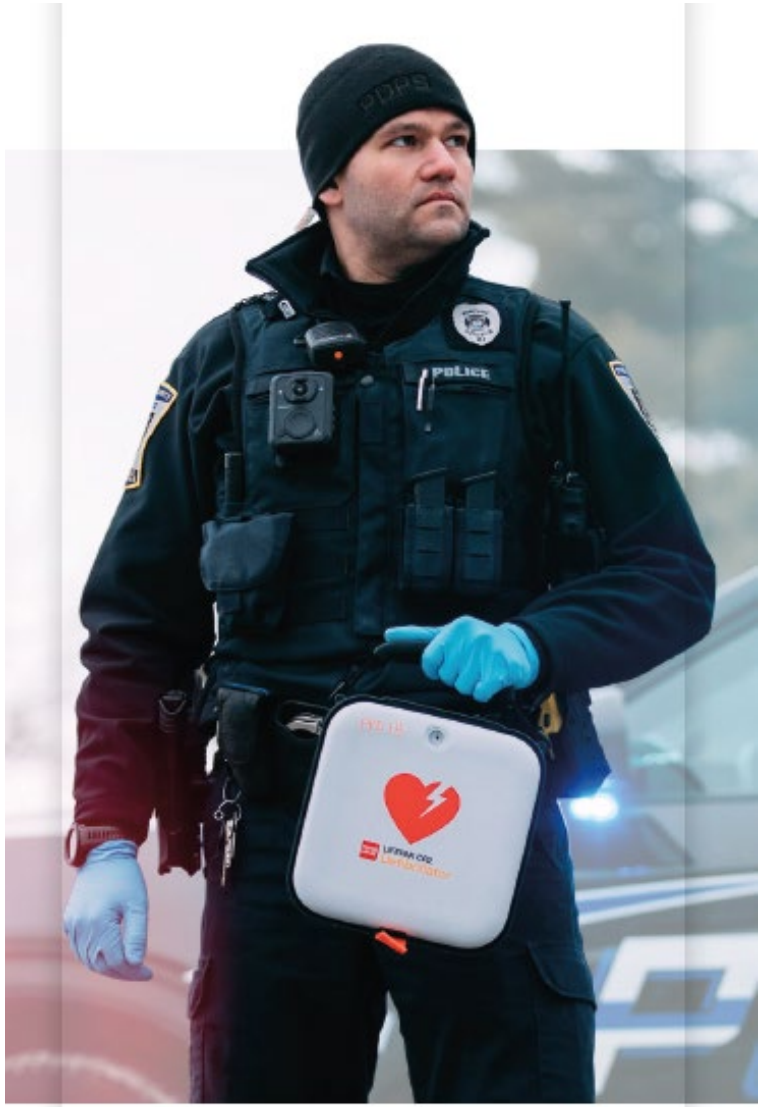
Hearts on Duty

When a LIEFPAK CR2 AED funded by the Helmsley Charitable Trust is used to save a life during a sudden cardiac arrest, the Hearts on Duty Program gives an AED to the officer involved in the save to donate to a community organization of their choice on the survivor's behalf.



Hearts on Duty Recognizes Sergeant Joseph Minwegen

Sgt. Minwegen has been with the Divide County Sheriff's Office since March 20, 2019. Before starting with the Divide County Sheriff's Office, he worked a year with the Minnesota State Patrol as a patrol trooper. Due to his excellent leadership skills, Sgt. Minwegen has quickly moved through the Divide County Sheriff's Office ranks. He is a wonderful asset to Divide County as he is always willing to help its citizens and treats them with respect and dignity regardless of the call for service. The Divide County Sheriff's Office is proud to have Sgt. Minwegen as a member of its team.

For questions, please contact:

Christine Greff, BSN, RN, SCRN
Cardiac and Stroke Systems Coordinator

- 701.328.4577 • cgreff@nd.gov

Visit our website at: https://www.hhs.nd.gov/health/EMS