DNV

WHEN TRUST MATTERS

COMPREHENSIVE STROKE CENTER CERTIFICATION PROGRAM REQUIREMENTS

Revision 22-1

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EFFECTIVE DATE

Comprehensive Stroke Center Certification Program Requirements (CSC), Revision 22-1.

Effective Date: January 1, 2022

Please Note: All new requirements and changes are marked in blue.

FEDERAL LAWS, RULES AND REGULATIONS

The Comprehensive Stroke Center Certification requirements are based in whole or in part on the most current recommendations from the Brain Attack Coalition (BAC), American Heart Association and the American Stroke Association (AHA/ASA) and the Center for Medicare and Medicaid (CMS) Conditions of Participation.

The most current version of Federal law and the Code of Federal Regulations referenced in this Certification Program document are incorporated herein by reference and constitute, in part, Comprehensive Stroke Center Certification requirements.

Comprehensive Stroke Centers through their association to hospitals participating in the Medicare and Medicaid program are expected to comply with current Conditions of Participation. When new or revised requirements are published, CSCs are expected to demonstrate compliance in a time frame consistent with the effective date as published by CMS in the Federal Register and/or as required by DNV Healthcare USA Inc.

For hospitals, outside of the United States, the Medicare requirement is not applied. If the country where the hospital is located has relevant rules, regulations or laws that affect the qualifications or requirements, those laws will be incorporated and adhered to.

Please Note:
American Heart Association/American Stroke Association will, on occasion, review the Guidelines for stroke care to provide an up-to-date comprehensive set of recommendations for clinicians. DNV's Comprehensive Stroke standards are reviewed and revised on a continual basis, and especially when a study becomes a new recommendation or when there has been a correction. It should be noted however, if new recommendations are not entered into this document, the CSC is still expected to follow any new recommendations within published guidelines from the AHA/ASA, much like that as required by CMS.

INTRODUCTION

The Comprehensive Stroke Certification (CSC) Program is offered by DNV Healthcare USA Inc. (DNV) and integrates requirements related to the CMS Conditions of Participation for Hospitals (CoPs), the Guidelines of the Brain Attack Coalition and Recommendations of the American Heart Association, the American Stroke Association.

CSCs are designed to be a part of a larger stroke system of care which will include all levels of stroke care. The CSC certification will mean that a hospital is equipped to evaluate, stabilize and to provide emergency care to all patients with acute stroke symptoms and admit the patient to a dedicated stroke unit or designated stroke beds. The intent of the CSC is to be fully capable to provide initial and complex diagnostic services, stabilization, emergent care and interventional therapies to patients with an acute stroke.

A CSC has the personnel, infrastructure, and expertise to diagnose, treat and support stroke patients who require highly intensive medical and surgical care, specialized tests, or interventional therapies. The types of patients who might use and benefit from a CSC include, but are not limited to, patients with ischemic strokes, large vessel occlusions, hemorrhagic strokes, or strokes from unusual etiologies that may require specialized testing or interventional therapies such as but not limited to clipping, coiling, thrombectomies, as well as other endovascular, and/or surgical procedures.

In addition, CSCs function as a resource center for other facilities in their region, such as Primary Stroke Centers (PSC), Primary Plus Centers (PSC + thrombectomy capable centers) and Acute Stroke Ready Hospitals (ASRs). This might include providing expertise about managing cases, offering guidance for triage of patients in collaboration with emergency medical service providers, making diagnostic tests or treatments available to patients treated initially at an ASR, PSC or PSC+ and being an educational resource for other hospitals and health care professionals.

REGULATORY AND POLICY REFERENCE

- The DNV Certification Process, Certification Requirements, and applicable CMS State Operations Manual (SOM) provide the framework for policies and procedures regarding certification activities.

- The Medicare Conditions of Participation for hospitals are in 42 CFR Part 482
  (For American hospitals, only)

- American Stroke Association / American Heart Association - Guidelines for Stroke Patients and Establishment of Stroke Systems of Care.

- Brain Attack Coalition – Pathways and Guidelines

Organizations seeking and maintaining a CSC certification must participate in the Medicare program and be following the Conditions of Participation (CoPs) of the Centers for Medicare and Medicaid Services (CMS). Compliance with the CMS CoPs may be demonstrated by maintaining accreditation with DNV or another accreditation organization, approved by CMS to deem healthcare organizations in compliance with the CoPs. (For American Hospitals, only)

This Certification Program document addresses healthcare organizations that are either applying to DNV Healthcare for certification of the Comprehensive Stroke Certification (CSC) Program or are currently certified by DNV. When a healthcare organization has applied for but not received DNV stroke certification, it is referred to as an “Applicant Organization.” When a healthcare organization is currently stroke certified by DNV, it is referred to as a “Certified Organization.”

The certification assessment survey is conducted separate and apart from a DNV Hospital Accreditation Survey or any other certification surveys. The CSC will be provided with advance notice of the upcoming survey at least one month prior to the assessment of the CSC.

ELIGIBILITY

Before the survey is scheduled, an organization must be able to demonstrate that they are eligible to become an applicant candidate.

CSC applicant organizations must be able to demonstrate that they:

- Are in current compliance with all Medicare Conditions of Participation at the time of application and at the time of the survey.
- Must have performed at least 15 thrombectomies on site at the applicant organization over the past 24 months from the date of application for initial eligibility.
- Provide care to 20 or more patients with a diagnosis of subarachnoid hemorrhage (non-traumatic and aneurysmal only) on site at the applicant organization over the past 24 months from the date of application for initial eligibility.
- Provide care for patients with a diagnosis of spontaneous intracerebral hemorrhage on site at the applicant organization. Provide volume for the past 24 months from date of application for initial eligibility. (No minimum volume requirement)
- Must have performed at least 10 endovascular or surgical procedures for aneurysm and arteriovenous malformations (AVM) treatment on site at the applicant organization over the past 24 months from the date of application for initial eligibility.
    - Example: coiling, clipping, liquid embolization, flow diverters, all types of aneurysmal embolization (May combine numbers.)
- Must have administered IV thrombolytics to at least 25 eligible patients on site at the applicant organization over the past 24 months from the date of application for initial eligibility.

  Note: IV thrombolytic that was given at another hospital based on tele-medicine recommendation by the CSC and transferred to the CSC may be counted in the eligibility numbers.

- Have advanced imaging capabilities:
    - CT scanning capability 24/7/365
    - CT angiography available on site 24/7/365
    - CT Perfusion (CTP) (only recommended at this time)
    - Magnetic resonance imaging (MRI) including diffusion weighted
    - Magnetic resonance angiography (MRA)
    - Carotid duplex ultrasound
    - Transcranial doppler
    - Transesophageal echocardiography
    - Transthoracic echocardiography

In addition, the applicant organization will:

- Have a designated neuro-intensive care unit (NICU)/ICU/designated beds for complex stroke patients that include staff and licensed independent practitioners with the expertise and experience to provide neuro-critical care.
- Participate in a stroke registry such as *Get With The Guidelines*, Coverdell, state required program, or healthcare system required program, etc. (For non- American hospitals, an equivalent data capture process will be identified)
- Participate in Institutional Review Board (IRB) reviewed stroke research.
- For initial eligibility requirements see PC.2.
- For ongoing eligibility requirements see PC.3.

SURVEY PROCESS

Before the Survey

Organizations that are in the process of becoming an applicant organization will receive support from the DNV stroke program staff. The sales team acts as an account manager right in the beginning of the process, giving information about DNV, the stroke program, and assisting through the application and contract development. A member of the team will build a quote for your organization, based on general rates and how many facilities may be involved in the application.

As an organization works its way through a review of the standards, there is a clinical team that is available to answer implementation, compliance, and interpretive guideline questions. The DNV stroke program staff know that your success in meeting the standards will mean better outcomes and success for your patients. The stroke program was developed to partner with healthcare organizations to improve the delivery of stroke care to the patients, their families and the communities that are served.

The organization will complete an application that will be reviewed for initial eligibility by the DNV stroke program director. Once eligibility has been determined, the application will be processed, a contract will be developed and sent to the applicant.

For a recertification survey, the organization is required to submit a recertification attestation and update form within 60 days before the scheduled survey.

The scheduling department will then contact the identified person listed on the application to work with the applicant organization to select dates that are available for survey. The stroke surveys are announced and conducted every year. This allows the applicant organization to arrange schedules and to send notices to everyone that would need to be at the facility during the stroke survey to represent their specific departments, processes, and responsibilities.

The assigned lead surveyor for the stroke survey will contact the stroke coordinator or other assigned person at the organization to introduce themselves, obtain any needed logistical information, answer any last-minute questions, and provide and review the proposed agenda.

During the Survey

Once on site, surveyors assess compliance with the certification requirements for services and locations in which the CSC operates for patient care services. The objective of assessment activities is to determine compliance with the requirements through observations, interviews, and document review.

The surveyors will focus attention on:

- actual and potential patient outcomes
- required processes
- the care and services provided, including the appropriateness of the care and services within the context of the certification requirements, and identified best practices.
- leadership involvement, commitment, and oversight of program

The surveyors will visit:

- the emergency department
- imaging locations
- interventional/surgical suites
- ICU, designated inpatient units
- rehabilitation areas
- other patient care settings, as appropriate to the level of services provided.

The surveyors will review:

- stroke program policies
- stroke program protocols
- stroke management order sets
- stroke committee meeting minutes
- transfer agreements
- telemedicine process and documentation
- on call schedules
- clinical records
- personnel files, competency, and required stroke education records
- provider credentialing files and required stroke education records
- other documentation necessary to validate information gained from observations and interviews.

After the Survey

Once the survey has been completed, you will receive your report within ten business days.

Survey Finding Definitions:

Nonconformance One (NC-1)

- Objective evidence exists that a certification requirement has not been addressed (intent), a practice differs from the defined system (implementation), or the system is not effective (effectiveness).
- The absence of one or more required system elements or a situation which raises significant doubt that the services will meet specified certification requirements.
- A group of NC-2 nonconformances indicating inadequate implementation or effectiveness of the system relevant to the certification requirement.
- An NC-2 nonconformance that is persistent (or not corrected as stated in the corrective action plan) shall be upgraded to NC-1, or a situation, that, on the basis of available objective evidence, may directly lead to unacceptable risk of patient harm or does not meet minimum standards of care.

Condition Level Finding

- A Condition Level finding is an NC-1 nonconformance in which the program is determined to be completely or substantially out of compliance with the certification requirements.
- A Condition Level finding will be identified as an NC- 1 nonconformance- Condition Level finding.
- All Condition Level findings will require a follow-up survey within sixty (60) calendar days from the last day of the survey.
- Certification cannot be continued until all Condition Level findings are reduced to an NC-1 nonconformance at the time of the follow-up survey.

Nonconformance Two (NC-2)

- A lapse of either discipline or control during the implementation of system/procedural requirements, which do not indicate a system breakdown or does not indicate a system breakdown that services will meet certification requirements. Overall system requirement is defined, implemented, and effective.
- As applicable, a finding as an NC-2 nonconformance may be:
  - An isolated non-fulfillment of a requirement that is otherwise properly documented and implemented, or
  - Inconsistent practice or,
  - Significant enough to warrant the client to take action to prevent future occurrence and/or has the potential for becoming a NC-1 nonconformance.

Client Follow-up Required for Nonconformances

A Corrective Action Plan (CAP) shall be sent to DNV within ten (10) calendar days from the date of the written report and address all reported elements of the nonconformances and/or all individual findings identified in the nonconformances.

The CAP shall:

- Identify the cause that led to the nonconformance
- Identify the actions taken to correct the nonconformance in the affected areas and/or processes
- Identify other areas and/or processes (if applicable) that have the potential to be affected by the same nonconformance
- Identify the process or system changes that will be made to ensure that the nonconformance does not recur including a staff training plan, as applicable
- Identify the time frame for the implementation of the corrective action measure(s) including specific dates of completion for corrections that have already been implemented before the CAP is submitted
- Identify the name of the person responsible for implementing the corrective action measure(s)
- Identify the performance measure(s) and/or other supporting evidence that will be monitored to ensure the effectiveness of the corrective action(s) taken.

DNV Follow-up with Client for Nonconformances

DNV will acknowledge receipt of the CAP and state any deficiencies and additional requirements with timelines for submission or declare acceptance of the submitted documentation. The organization is expected to implement corrective action measure(s) within sixty (60) days. When this is not feasible, DNV will consider and evaluate the circumstances involved and approve a suitable timeframe to enable the client to implement the corrective action measure(s). Although such instances for extending the timeframe will be evaluated on a case-by-case basis, it would be a rare occurrence for the extended timeframe for implementation of corrective action measure(s) to exceed six (6) months.

For NC-1 nonconformances, within sixty (60) business days of DNV acceptance, the client shall submit performance measure(s) data, findings, results of internal reviews (internal audits), or other supporting documentation, including timelines to verify the implementation of the corrective action measure(s).

If an NC-1 nonconformance results in a Condition Level finding, a follow-up survey prior to the next annual survey will also be required to determine compliance with the specific NC-1 nonconformance.

For NC-2 nonconformances. For level 2 non-conformities, once the corrective action plans have been accepted, there are no requirements to send further data or other information. Those findings and the accepted corrective action plan will be reviewed on site during the following year's survey for validation of implementation.

DNV will respond to the client regarding acceptance of the submitted documentation and identify any deficiencies and additional requirements with timelines for submission. Failure to comply with the requirements of the CAP regarding nonconformances may also result in a Condition Level finding. DNV, in its sole discretion, shall determine the need for a follow-up survey when compliance and implementation cannot be reasonably determined through written submission of objective evidence. The scope and extent of the follow-up survey will be determined based upon the complexity of the nonconformance, and one or more surveyors will be assigned to the follow-up survey. When possible, members of the survey team who conducted the survey when the nonconformance was issued will be assigned. When this is not feasible, DNV will assign a surveyor who is familiar with the process and has the qualifications to validate compliance.

Considerations

The client is under no obligation to respond to comments and direct observations that the surveyor and the program staff may have discussed during the survey. These considerations are in two categories:

Observations: An Observation is not a nonconformance, but something that could lead to a nonconformance if allowed to continue uncorrected; or an existing condition without adequate supporting evidence to verify that it constitutes a non-conformity.

Opportunities for Improvement: An Opportunity for Improvement relates to areas and/or processes of the stroke program which may meet the minimum requirements for certification, but which could be improved. An opportunity for improvement may be system or performance related and is normally addressed based on the experience of the surveyor team, knowledge of best practice from other hospitals or from practices within other units/departments.

Suspension of Certification Status

Suspension of certification status may occur at annual or recertification surveys and shall be based on any of the following:

- Lack of continual fulfillment of the conditions set out in the Certification Agreement
- Condition level non-conformance identified in a stroke certification survey
- Client fails to submit an acceptable CAP and/or related documentation
- Established reasonable timelines in a CAP are not met
- Client violates terms of the signed certification agreement, including non-payment of fees or refusal of access
- Failure to respond adequately to nonconformances identified during the program certification process
- Client makes false public claims regarding its certification status. (e.g., certification status is used in a way that is unjustifiable or deceptive in advertising)
- Information from stakeholders that could affect the status of the certified program (e.g., non-compliance with regulatory/statutory requirements)
- Individual is delivering patient care or providing services without a required valid license, certification, or registration
- Preventable issues that pose Immediate Jeopardy (has caused or is likely to cause serious injury, harm, impairment, or death)
- Non-compliance with statutory and regulatory requirements of state and/or federal law

The requirements that the certified program shall meet to be removed from suspension of certification status and the length of time a certified program may remain in suspension status shall be outlined in the Suspension of Certificate notification. Any extension shall be based on a progressing Corrective Action Plan that has been validated by a Special Survey.

For initial surveys, DNV awards the CSC certificate on the acceptance of the corrective action plan that has been submitted; however, there are some rare occasions where there is a valid concern about the organizations ability to address the non- conformities or if a serious patient issue is identified.

If that happens, the certificate will be delayed pending submission of corrective action data that is obtained to support that the issue is resolved or mitigated. At that time, further information and submitted data will be reviewed and a determination by the certification committee will be made. One recommendation may be to accept the submitted information and issue the certificate. One other recommendation may be that a surveyor needs to revisit on site for a day, to survey only those components that would be thought to need in person validation when on site would be required. Both processes as described, happen rarely, but they do happen. This is a risk-based approach to our process, and we need to have a high confidence level at the initial survey.

Some circumstances that could trigger a delay on awarding of certification could include but not be limited to issues such as:

- Significant inadequate monitoring of patient's condition post administration of thrombolytics, post thrombectomies or other endovascular and/or surgical/invasive interventions
- Lack of 24/7 coverage for critical care
- Continuous diversion for clipping, coiling and other neuro surgical interventions due to lack of coverage of neuro surgical services.
- Loss or lack of medical staff to perform neuro interventions
- Lack of privileging for medical staff for performed procedures
- Lack of identified medical director of the stroke program
- Lack of identified registered nurse stroke coordinator
- Extended interruption or cessation of services

ABBREVIATIONS AND DEFINITIONS

AANN	American Association of Neuroscience Nurses
ABEM	American Board of Emergency Medicine
ABNN	American Board of Neuroscience Nursing
ACEP	American College of Emergency Physicians
ACLS	Advanced Cardiac Life Support
Acute care phase	includes critical care units, intermediate care units, stroke units and general medical units
AHA	American Heart Association
AIS	Acute Ischemic Stroke
ASA	American Stroke Association
ASR	Acute Stroke Ready Organization that can provide timely access to stroke care but not able to meet all of the criteria of PSCs or CSCs
AF or Afib	an irregular heartbeat that puts the patient at a 5x greater risk for stroke. Afib may be detected by monitoring the heart's rhythm over time.
Alteplase	Tissue plasminogen activator tPA (thrombolytic medication)
AMA	American Medical Association
AOBEM	AOS Osteopathic Board Certification in Emergency Medicine
AVM	Arteriovenous malformation
BAC	Brain Attack Coalition
BLS	Basic Life Support
CDC	Centers for Disease Control and Prevention
CEA	Carotid Endarterectomy
CFR	Code of Federal Regulations
CMS	Centers for Medicare Medicaid Services
CNRN	Certified Neuroscience Registered Nurse
CNS	Clinical Nurse Specialist
CR	Certification Requirement.
CSC	Comprehensive Stroke Center
CSRN	Certified Stroke Registered Nurse
CTA	Computed Tomography Angiography
CTP	Computed Tomography Perfusion
DEA	Drug Enforcement Administration
ECG	Electrocardiogram
ED	Emergency Department
EMS	Emergency Medical Services
ENLS	Emergency Neurological Life Support
EVD	External Ventricular Drain

FDA	Food and Drug Administration
GCS	Glasgow Coma Scale
HHA	Home Health Agency
IAT	Rapid Local delivery of thrombolytic agent through a micro catheter placed near the site of occlusion
ICH	Intracerebral hemorrhage
ICP	Intracranial Pressure
ISMP	Institute for Safe Medication Practices
ISO	International Organization of Standardization
LIP	Licensed Independent Practitioner
LSC	Life Safety Code® National Fire Protection Association
MRA	Magnetic Resonance Angiography
MRI	Magnetic Resonance Imaging
mRS	Modified Rankin Scale
NIHSS	National Institutes of Health Stroke Scale
NFPA	National Fire Protection Association
OT	Occupational Therapist
PA	Physician Assistant
PT	Physical Therapist
PSC	Primary Stroke Center
PWI	Perfusion weighted imaging
QMS	Quality Management System
RN	Registered Nurse
SAH	Subarachnoid hemorrhage
SCRN	Stroke Certified Registered Nurse
SLP	Speech Language Pathologist
Tele-medicine	An approach to treating vascular disease that allows a neurologist to provide Tele-medicine remote treatment for a stroke victim. Electronic communications may include telephone, internet, or video conferencing, providing consultation and diagnostic services.
Tenecteplase	Tissue plasminogen activator TNKase (thrombolytic medication)
TIA	Transient ischemic attack
Troponin	Complex of three regulatory proteins (**troponin** C, **troponin** I, and **troponin** T) that is integral to muscle contraction in skeletal muscle and cardiac muscle. Often elevated after stroke.

PROGRAM MANAGEMENT (PM)

The stroke program shall establish, document, implement and maintain the stroke program and continually improve its effectiveness in accordance with the requirements of this Certification Program.

PM.1 Senior Management

CR.1 Senior management is responsible and accountable for ensuring the following:

CR.1a The stroke program is in compliance with all applicable State, Federal, and laws regarding the health and safety of its patients.

CR.1b The stroke program is licensed by the appropriate State or local authority responsible for licensing of stroke programs (if applicable).

CR.1c Criteria for hiring, appointments and privileging include aspects of individual character, competence, training, experience, and judgment. Criteria will be established for the selection of individuals working for the stroke program, directly or under contract.

CR.1d That all personnel working in the stroke program are properly licensed, certified or otherwise meet all applicable State, Federal, and local laws.

CR.1e Responsibilities and authorities are defined and communicated within the stroke program.

CR.1f Appointment, privileging and re-privileging of an identified medical director who is charged with the overall management of the stroke care provided by the stroke program.

CR.1g Appointment, privileging and re-privileging of all practitioners who are performing procedures or involved in stroke program activities that may require specific skills, training, or education.

CR.2 The medical director for the stroke program must have training and expertise in cerebrovascular disease. Qualifications for the stroke program medical director shall include greater than or equal to 2 of the following: (See MS.2)

- Board-certified neurologist, neurosurgeon or neurointerventional radiologist who has completed a stroke fellowship, neurointerventional radiology fellowship or vascular neurosurgery fellowship or has equivalent experience
- Completion of a vascular neurology fellowship or board certified in vascular neurology,
- A clinician who diagnoses and treats greater than or equal to 50 patients with cerebrovascular disease, annually.
- A clinician with greater than or equal to 5 peer-reviewed publications dealing with cerebrovascular disease.
- A clinician with greater than or equal to 8 continuing medical education (CME) credits (or equivalent educational experience) each year in areas directly related to cerebrovascular disease

and

- Other criteria agreed on by the medical staff and the host hospital governing body or other criteria as determined by the local health care system.

CR.3 The medical director or designee shall be currently credentialed and privileged to provide stroke care and is available 24 hours per day, 7 days per week, 365 days per year to provide leadership on medical, logistical, and administrative issues.

CR.4 The director shall be involved in the assessment of patients and provide consultative advice to other treating physicians.

CR.5 There shall be a written delineation of scope, coverage (including back up), authority and responsibilities of the stroke medical director.

CR.5a If there is a co-program medical director identified, there shall be a written delineation of scope, coverage (including back up), authority and responsibilities of each co-director.

PM.2 Management Commitment

Senior management shall provide evidence of its commitment to the development and implementation of the stroke program and continually improving its effectiveness by:

CR.1 Communicating to the stroke program the importance of meeting customer as well as statutory and regulatory requirements,

CR.2 Establishing and assisting in meeting the stroke programs mission, goals, and objectives,

CR.3 Ensuring the availability of resources and information necessary to support the operation.

PM.3 Program Leadership

The stroke program leadership shall:

CR.1 Define in writing the program's mission and scope of service which describes the design, implementation and evaluation of the processes needed for the stroke program service delivery.

CR.2 Determine criteria and methods needed for both the operations and consistent control of processes, to ensure effective care and treatment.

CR.3 Conduct program reviews at least annually to determine achievement towards goals, objectives, and outcomes

CR.4 Monitor, measure and analyze identified program processes, and

CR.4a Implement actions necessary to achieve planned results and continual improvement of those selected program processes.

CR.4b When the stroke center program requirements are changed, the stroke program shall ensure that relevant documents are amended and that relevant personnel are made aware of the changed requirements.

QUALITY MANAGEMENT (QM)

QM.1 Management

The governing body (or organized group or individual who assumes full legal authority and responsibility for operations of the stroke program), medical staff, and administrative officials are responsible and accountable for ensuring that the stroke program implements and is included in the host hospital quality management system. The host hospital will assure that adequate resources are allocated for measuring, assessing, improving, and sustaining the stroke center's performance and reducing risk to patients.

CR.1 The stroke center must be involved in and implement the host hospital's method for maintaining an ongoing system for managing quality and patient safety.

CR.2 The stroke center must implement quality assessment and performance improvement efforts to address priorities for improved quality of care and patient safety and that corrective and preventive actions are implemented and evaluated for effectiveness.

CR.3 The stroke center has established programmatic measurable quality objectives and the results are analyzed and addressed.

CR.4 Appropriate quality information from the stroke program has been submitted to the host hospital oversight group for review and management.

QM.2 Quality Outline/Plan

The stroke program shall clearly outline its methodology, practice, and related policies for addressing how quality and performance are measured, monitored, analyzed, and continually improved to improve health outcomes and reduce risks for patients.

QM.3 Quality Objectives

Program management shall ensure that stroke program's quality objectives, including those needed to meet requirements for the stroke center, are established. The quality objectives shall be measurable and consistent with the requirements of the stroke center certification program.

QM.4 Quality Representative

A quality representative shall be designated and shall have the responsibility and authority for ensuring that the monitoring requirements of the stroke program are implemented and maintained. (The registered nurse stroke coordinator may also be the quality representative.)

QM.5 Program Review

CR.1 Variations, deficiencies or non-conformities identified by the stroke center shall be addressed by the stroke committee. Corrective actions will be determined, applied, documented, and reviewed for outcomes.

CR.2 Program processes and data review will be performed at regular intervals, at a minimum of once a quarter, with an annual evaluation of the effectiveness of the stroke center program components and metrics.

QM.6 System Requirements

The stroke center will participate in and follow the system requirements of the host hospital in establishing a quality system. The stroke center will be required to have the following as a part of this system:

CR.1 An interdisciplinary stroke committee to oversee the stroke specific quality data that includes the medical director of the stroke program, the registered nurse stroke coordinator (stroke coordinator may be a registered nurse or advanced nurse practitioner) and a quality representative. This will be considered the Core Stroke Team. Other discipline representatives and practitioner members of the stroke committee are at the discretion of the stroke center leadership. This interdisciplinary stroke committee shall conduct quality and programmatic reviews.

Note: The registered nurse stroke coordinator may also be the quality representative.

CR.2 There shall be a written document defining the quality oversight process, to include the following components of the stroke center clinical and non-clinical services:

CR.2a Measurable Quality Objectives

CR.2b Goal measurement / prioritization of activities based in some manner to consider:

- Problem-prone areas, processes, or functions,
- The incidence, prevalence, and severity of problems in these areas, processes, or functions,
- Effect on health outcomes,
- Improving patient safety and quality of care.

QM.7 Measurement, Monitoring, Analysis

The stroke center should strive to optimize its overall effectiveness of processes and systems of the service. This goal should be accomplished by identifying performance measures for each component and for the system function as a whole including structure, process and outcomes measures. Evaluations of the stroke center should encompass overall patient outcomes, linkages among key components of the stroke center, as well as potential problems that may impede the care provided under the stroke center.

Measurement, monitoring and analysis of the processes of the stroke center require established measures that can detect variation, identify problem processes, identify both positive and negative outcomes and effectiveness of actions taken to improve performance and/or reduce risks.

The stroke center leadership shall be responsible for the development of performance measures and strategies for measuring, refining and reassessing. Stroke center leadership shall define the frequency and detail of the measurement for, at a minimum, the following key system components:

CR.1 Notification and EMS, including data exchange between EMS, ED and the Stroke Team so that relevant pre-hospital data can be incorporated into the evaluation of effectiveness of the stroke center.

Note: This data will capture stroke team response time to acute stroke patients, treatments used and patient disposition. It is the discretion of the stroke center to determine the collection of this data as to whether this is through written or electronic means and/or may be done retrospectively through chart reviews.

CR.2 Hyperacute stroke treatment with specific performance measures involving the timeliness and effectiveness of the acute treatment of both ischemic and hemorrhagic stroke and the prevention of complications.

CR.2a Door to ED physician/provider less than or equal to 10 minutes

CR.2b Door to stroke team in less than or equal to 15 minutes

CR.2c Door to CT interpretation less than or equal to 45 minutes

CR.2d Order to lab results less than or equal to 45 minutes, if ordered

CR.2e Connected contact (computer linkage, phone, or whatever form the organization utilizes) to telemedicine consultant from the time when determined medically necessary by ED physician less than or equal to 20 minutes.

CR.2f Achieving Door to Needle times (time of bolus) within 60 minutes in 75% or more of acute ischemic stroke patients treated with IV thrombolytics

AND

Achieving Door to Needle times (time of bolus) within 45 minutes in 50% or more of acute ischemic stroke patients treated with IV thrombolytics.

CR.2g Transfer of patients to PSC+/CSC in less than or equal to 2 hours of ED arrival, or when medically stable (Door-in-Door out (DIDO))

OR

CR.2h Door to monitored bed admission in less than or equal to 3 hours

Note: Monitored bed has the capability to have continuous monitoring of vital signs, pulse oximetry and other requirements, as needed. If the organization is keeping the patient in the emergency department as the monitored bed requirement prior to transfer or admission, adequate staffing with demonstrated competence shall be provided to meet the required stroke care as ordered by the admitting provider.

CR.3 There shall be secondary prevention measures of patient outcomes and avoidance of complications and recurrent strokes. (See Table Below)

#	STK	Stroke Measurement	Ischemic	Hemorrhagic
3a	1	*Venous Thromboembolism Prevention (VTE)*	**x**	**x**
3b	2	*Discharged on Antithrombotic Therapy*	**x**	
3c	3	*Anticoagulation Therapy for Atrial Fibrillation*	**x**	
3d	4	*Thrombolytic Therapy*	**x**	
3e	5	*Antithrombotic Therapy by end of day 2*	**x**	
3f	6	*Discharged on statin medication*	**x**	
3g	7	*Dysphagia Screen*	**x**	**x**
3h	8	*Stroke Education (patient and family)*	**x**	**x**
3i	10	*Assessed for Rehabilitation*	**x**	**x**

CR.4 There shall be rehabilitation performance measures to evaluate patient outcomes, functional status, and potential discharge needs and the percentage of stroke patients who receive the appropriate level of rehabilitation services in the system. (Applies only if stroke patients are admitted for more than end of life/comfort measures.)

CR.4a Assessment of the patient and identification of impairments within 24 hours of admission or when feasible once the patient is medically stable.

CR.4b There shall be a speech therapist available on site or on call to evaluate the stroke patient for dysphagia within 24 hours of admission if patient has been made NPO and/or failed a swallow screen.

CR.4c Assessment of barriers to participation in therapy during the hospital admission.

CR.4d Therapy should provide patients and family/caregivers with education and information to improve the understanding of stroke rehabilitation management in the acute care setting. (Education and/or materials need to be individualized to preferred learning methods)

CR.5 There shall be community education performance measures, evaluating community outreach initiatives by measuring the knowledge in the community about the causes, signs and symptoms of stroke as well as emerging stroke prevention strategies. The stroke center shall offer at least 2 programs per year to educate the public about stroke prevention, diagnosis, and/or the availability of acute therapies.

CR.6 Functional status and discharge outcome measures

CR.6a Pre-Morbid Modified Rankin Score by or at discharge. (Applies to all stroke patients who are admitted for more than end of life/comfort measures).

CR.6b Modified Rankin Score at time of discharge from the stroke center. (Applies to all stroke patients who are admitted for more than end of life/comfort measures).

CR.6c Modified Rankin Score 90-days after discharge (Applies only to stroke patients who have been treated with thrombolytics and/or with an endovascular recanalization procedure).

CR.7 The stroke center shall monitor perioperative complication rates and overall outcomes.

CR.7a The mortality rate for thrombolytic administration, aneurysm clipping, coiling and other surgical or interventional procedures, should be documented and reviewed (as applicable).

CR.7b A formal Morbidity and Mortality process shall review all cases that meet defined quality indicators. Records of the results of the Morbidity and Mortality review and actions arising from the review shall be documented and maintained.

QM.8 Patient Safety System

CR.1 The stroke center shall follow and participate in the host hospital's program for establishing clear expectations for identifying and detecting the prevalence and severity of incidents that impact or threaten stroke patient safety.

CR.1a This may include data such as falls, medication errors, safety initiatives etc. The host hospital will determine data designation for inclusion in program as well as any indicators specific to the safety of the stroke programs population as determined by the stroke committee. (i.e., sepsis, central line associated bloodstream infection (CLABSI), catheter associated urinary tract infection (CAUTI), dysphagia/aspiration pneumonia, ventriculitis)

QM.9 Stroke Center Metrics for Measuring Processes and Quality

(See Addendum A: Metrics for Measuring Processes and Quality)

(See Addendum B: DNV GWTG Data Crosswalk)

PATIENT CARE SERVICES (PC)

PC.1 Planning for Service Delivery

CR.1 The stroke center, with other disciplines, shall plan and develop the processes needed for stroke center service delivery. Planning of the stroke center service delivery shall be consistent with the certification requirements of the processes of the stroke center program. In planning stroke center services delivery, the stroke center shall determine the following, as appropriate:

CR.1a Quality objectives and requirements for the stroke center.

CR.1b The need to establish processes, documents and resources specific to the stroke center;

CR.1c Required verification, validation, monitoring, and measurement, specific to the stroke center.

CR.1d Records needed to provide evidence that the processes meet requirements. The output of this planning shall be in a form suitable for the stroke center's method of operations.

PC.2 Review of Initial Eligibility

CR.1 The applicant stroke center shall review the requirements related to the desired level of stroke center certification program. This review shall be conducted prior to the stroke center's commitment to provide services to patients and shall ensure that:

CR.1a The stroke center has the ability to meet the defined requirements.

CR.1b Records (i.e. meeting minutes) of the results of reviews and actions shall be maintained.

CR.1c Acute Stroke Team available 24/7/365

CR.1d Written protocol for stroke identification, triage, diagnosis and treatment

CR.1e Written agreement/plan with primary EMS agency

CR.1f Provide care to at least 20 or more patients with a diagnosis of subarachnoid hemorrhage (non-traumatic and aneurysmal only) on site at the applicant organization over past 24 months from the date of application for initial eligibility.

CR.1g Provide care for patients with a diagnosis of spontaneous intracerebral hemorrhage on site at the applicant organization. Provide volume for the past 24 months from date of application for initial eligibility. (No minimum volume requirement)

CR.1h The CSC must have performed at least 10 endovascular or surgical procedures for aneurysm /arteriovenous malformation treatment on site at the applicant organization over the past 24 months from the date of application for initial eligibility.
Example: coiling, clipping, liquid embolization, flow diverters, all types of aneurysmal embolization (May combine numbers of procedures.)

CR.1i The CSC shall have performed at least 15 thrombectomies onsite at the applicant organization over the past 24 months from the date of application for initial eligibility.

CR.1j The CSC shall have administered IV thrombolytics to at least 25 eligible patients over the past 24 months from the date of application for initial eligibility. The following condition may be applied to the eligible patient numbers in addition to the administration of thrombolytics at the CSC site.

Note: IV thrombolytics that were given at another hospital based on tele-stroke recommendation by the CSC and transferred to the CSC when the patient is stable for continued care may be counted in the eligibility number of thrombolytic administrations.

CR.1k Provide care for patients with a diagnosis of transient ischemic attack on site at the applicant organization. Provide volume for the past 24 months from date of application for initial eligibility. (No minimum volume requirement)

CR.1l The CSC shall provide the full spectrum of treatment capabilities and options including but not limited to: IV thrombolytics, AVM treatment, thrombectomies, endovascular embolization, clipping, coiling, stenting of carotids, etc.

CR.1m The CSC shall have collected, analyzed and presented to the stroke quality committee, at least one quarter of required metrics data for initial eligibility

CR.1n Shall participate in Institutional Review Board (IRB) reviewed stroke research.

PC.3 Recertification Process and Requirements

CR.1 The stroke center shall submit a recertification attestation and update within 60 days before the scheduled recertification survey.

CR.1a Thrombectomies - at least 25 thrombectomies required over the past 24 months for recertification

CR.1b Endovascular or surgical procedures for aneurysm /arteriovenous malformation treatment on site at the organization - at least 20 required over the past 24 months for recertification.

CR.1c Provide care for at least 20 or more patients with a diagnosis of subarachnoid hemorrhage (non-traumatic and aneurysmal only) on site at the organization over the past 24 months for recertification

CR.1d Provide care for patients with a diagnosis of spontaneous intracerebral hemorrhage, on site at the recertifying organization. Provide volume for the past 24 months. (No minimum volume requirement)

CR.1e Administered IV thrombolytics to at least 25 eligible patients over the past 24 months for recertification

CR.1f Provide care for patients with a diagnosis of transient ischemic attack, on site at the recertifying organization. Provide volume for the past 24 months for recertification. (No minimum volume requirement)

CR.1g Changes to leadership such as nurse stroke coordinator, stroke medical director, primary contact, practitioners,

CR.1h New Services offered, or previous services discontinued

CR.1i Interruption of services lasting over a two-week time period

CR.1j Change of hospital name or healthcare system/affiliation,

CR.1k Research - current and/or closed

PC.4 Emergency Department

CR.1 The stroke center is responsible for developing and maintaining pathways, protocols and processes to rapidly identify, evaluate and treat potential stroke patients.

CR.2 Emergency department practitioners and staff can demonstrate knowledge and understanding of the stroke protocol in place, including effective communication with EMS personnel, notification of the stroke team and initiation of the stroke protocol concurrent with the ED evaluation and management.

CR.3 The emergency department practitioners and staff demonstrate knowledge in the delivery of acute therapies that can improve a patient's outcome with a variety of strokes, when indicated, including, but not limited to:

- Intravenous thrombolytics
- Management of relevant comorbidities
- Reversal of coagulopathies
- Control and reduction of elevated intracranial pressure
- Control of seizures
- Blood pressure management
- Oxygenation management

CR.4 Documentation supports (that):

CR.4a The patient has been assessed and treatment decisions have been made within 45 minutes of the arrival to the emergency department

CR.4b Performance of all assessments are timed and recorded,

CR.4c The patient has passed a dysphagia screen before receiving any oral medications, food or fluids,

CR.4d Blood glucose levels assessed before IV thrombolytic eligibility is determined,

CR.4e The acute stroke patient has been assessed with the NIH Stroke Scale by a certified/qualified nurse or physician member of the Acute Stroke Team. (See QM.9 CR.1 Metric 1)

CR.4f Intravenous thrombolytic administered to eligible ischemic stroke patients within 4.5 hours of onset of stroke symptom recognition, (See QM.9 CR.2 Metric 2)

CR.4g The assessment and treatment of signs and symptoms of blood pressure and neurological deterioration during and post IV thrombolytic therapy per current AHA/ASA guidelines are as follows:

Thrombolytic Monitoring Requirements	Pre-Bolus	Tenecteplase Post-Bolus	During Alteplase Infusion	Post Alteplase Infusion
Neurological assessment	No more than 15 minutes before bolus	Every 15 minutes for two hours	Every 15 minutes during the one-hour infusion	Every 15 minutes for the first hour after infusion
		Every 30 minutes for next 6 hours		Every 30 minutes for next 6 hours
		Hourly from eighth hour post bolus until 24 hours after bolus		Hourly from eighth post infusion hour until 24 hours after infusion
Vital Signs	No more than 15 minutes before bolus	Every 15 minutes for two hours	Every 15 minutes during the one-hour infusion	Every 15 minutes for the first 1 hour after infusion
		Every 30 minutes for the next 6 hours		Every 30 minutes for the next 6 hours
		Hourly from eighth hour post bolus hour until 24 hours after bolus		Hourly from eighth post infusion hour until 24 hours after infusion

CR.4h Recognition, assessment, and management of complications of acute stroke and treatments (vital signs, neuro status, angioedema etc.) and the process for notification of deterioration to medical staff and others.

CR.4i In the event an eligible patient with ischemic stroke does not receive IV thrombolytic therapy, documentation will support the rationale.

CR.5 All patients who arrive within 24 hours of onset of stroke symptom recognition, are assessed for endovascular treatment options whether receiving IV thrombolytic therapy or not a candidate for IV thrombolytic therapy. Documentation must be present as to the decision by the treating physician.

CR.6 There are specified timeframes addressed within the stroke protocol related to the initial assessment, treatment, and management as applicable to the emergency department (See QM.7 CR.2)

CR.7 Maintain a current and complete call schedule (including back up) with contact information of the physicians on staff and/or available for the stroke center.

CR.8 The Emergency Department/Stroke Program will maintain a log that includes:

CR.8a Documentation of patient arrival, stroke alert call initiation, response times, patient diagnoses, treatments, outcomes and dispositions will be kept and used for quality data review

CR.8b The stroke center must maintain a log of times it notifies EMS that it is on diversion and unable to provide services for stroke patients in accordance with local policies and procedures.

CR.8c The stroke center must maintain a log documenting when the referral CSCs were not able to provide neurosurgical and/or endovascular services.

PC.5 Emergency Medical Services

The Emergency Medical Service (EMS) plays a key role with the timely recognition, treatment, transfer, and outcomes of patients with acute stroke. The stroke center has established a strong relationship with the community EMS. Interagency collaboration with development and review of policies/procedures and education is strongly encouraged.

CR.1 A document of cooperation between the stroke center and the EMS is in place. This document is a written plan for transporting and receiving patients with stroke symptoms via the EMS system

CR.2 The hospital collaborates with emergency medical services (EMS) providers to make certain of the following:

CR.2a The program has a relationship with EMS providers that include notification when a patient with a suspected stroke is being transported to the hospital to activate the stroke alert and has a process to give feedback on patient outcomes. (Refer to applicable state limitations on notification in transit).

CR.2b The program has access to treatment protocols utilized by EMS providers and pre-hospital personnel in response to patients reporting symptoms of stroke

CR.2c The program has stroke patient priority destination protocols utilized by EMS providers that address transport of stroke patients, in accordance with law and regulation

CR.2d The program works collaboratively with EMS to establish that personnel have specific training in the use of at least one accepted field assessment tool such as the Cincinnati Pre-hospital Stroke Scale or other accepted tool.

CR.2e The program and EMS will outline circumstances for which the stroke center would be on diversion and not able to accept patients.

CR.2f The program works collaboratively with EMS to establish that personnel have annual training in stroke diagnosis and treatment. This EMS training may be co-sponsored with other healthcare facilities in the community.

PC.6 Telemedicine/Tele-stroke

CR.1 The organization must have a written description of telemedicine technologies available on site at the stroke center, if utilized.

Note: This may be a range of technologies from a phone call consultation to remote visual interactive physical exam with real time viewing of the patient and/or their neuroimaging studies.

CR. 2 The medical professionals providing remote medical guidance will have evidence of training and expertise that is required.

CR. 3 The telemedicine link or neuro consultant should be available within 20 minutes of when it is deemed necessary by the emergency physician.

PC.7 Acute Stroke Team (AST)

CR.1 The organization must have a designated interdisciplinary acute stroke team (AST). This team may be divided into two main parts.

Part one is the code team members who respond to a stroke code, either through the emergency department and/or in-house stroke alerts.

Part two of the stroke team organization works together daily to facilitate the adherence to stroke program policies, procedures, protocols and access to care for patients.

All members of the stroke team should have current job descriptions available that contain the experience, educational and performance expectations for their role on the stroke team.

This may be an addendum to a job description, program narrative and/or in program specific competencies.

CR.1a Annual/periodic performance evaluations shall include performance of stroke related duties, activities and fulfillment of education requirements.

CR.1b The stroke center shall define the qualifications, roles, and responsibilities required for designation of qualified practitioners, professionals, and other personnel assigned to the AST through plans and policies.

CR.1c The Acute Stroke Team will be comprised of personnel that may be employed, contracted or otherwise available in some manner to the CSC to encompass the following areas of expertise:

- Neurologist or Neurosurgeon, board certified or eligible;
- Interventionalists with expertise in performing mechanical thrombectomies,
- Surgeons with expertise in treating intracranial and extracranial disease,
- Physicians with expertise in cerebrovascular disease;

- Emergency department personnel
- Emergency Medical Services (EMS)
- Mobile Stroke Unit personnel, if applicable
- Nursing staff trained in the care of acute stroke patients,
- Diagnostic Radiologists
- Radiology technologists (including MRI and CT technologists),
- Rehabilitation therapists with expertise in treatment of acute stroke patients,
- Rapid response team designated members, if applicable
- Case manager or social worker, as indicated
- Other qualified professionals with expertise defined by the medical staff and CSC team, as indicated

CR.2 The AST (code team) is available and on call 24 hour/day, 7 days a week.

CR.2a The AST should respond to suspected patients with an acute stroke who are in the emergency department or on an inpatient unit in the host hospital.

Note: Although their presence in the hospital is preferred, members of the AST may reside outside of the hospital as long as they can be at the bedside within 15 minutes of being called.

CR.3 Members of the AST will receive initial orientation and ongoing education and trainings that are related to or focused on cerebrovascular disease and treatment of acute stroke patients to ensure competence of personnel.

Note: The stroke center may determine the personnel assigned to the AST that could be required to receive less than the minimal required hours of education and training. This will be at the discretion of the stroke center to exclude any personnel, with justification, when they are not specifically dedicated to the stroke center.
(See SM.2 CR.4 for detailed requirements)

CR.4 The stroke center shall include an Advanced Practice Practitioner as part of the stroke center team.
(See SM.2 CR.4 for detailed requirements)

Note: Stroke advanced practice providers may include a nurse practitioner, a master's prepared clinical nurse specialist, stroke certified nurse, physician's assistant.

PC.8 Protocols

CR.1 The stroke center shall develop stroke protocols (pathways), based on current evidence-based practice for the treatment of emergent and ongoing care for acute stroke patients. This will be shared with emergency department practitioners, EMS providers, and ICU and/or Stroke Unit for the care of acute stroke patients. There shall be written protocols for emergent and ongoing patient care including but not limited to:

CR.1a TIA

CR.1b Ischemic stroke

CR.1c Hemorrhagic stroke (ICH and SAH)

CR.1d EVD placement and management

CR.1e Telemedicine/Tele-stroke consultation

CR.1f IV thrombolytic administration and post monitoring

CR.1g Dysphagia screening (evidence-based tool)

CR.1h Transfer (both receiving to the CSC and out to another CSC)

CR.1i In-house stroke alert

CR.1j Post-operative/post endovascular procedure monitoring

CR.1k Recognition and treatment of angioedema and other adverse conditions

CR.1l Protocols and or pathways are to be reviewed and updated, as needed, at least annually by the medical staff.

Note: Consider the AHA recommendations on using epinephrine as described in the in Table 7. Management of Orolingual Angioedema Associated With IV Alteplase Administration for AIS AHA/ASA. (2019) *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 A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association*

CR.2 The response process shall include an early implementation of stroke protocol (pathway) and notification to the acute stroke team upon entry to the ED or prior upon notification from EMS personnel.

CR.3 The stroke protocols (pathways) will include standardized order sets for the diagnosis, evaluation and management of the acute stroke patient following current AHA guidelines that address:

CR.3a Vital signs and neurological assessment frequency

CR.3b Blood pressure management parameters

CR.3c Blood glucose control

CR.3d Temperature regulation parameters

CR.3e Oxygenation management parameters

CR.3f Blood tests (including point of care)

CR.3g Brain imaging

CR.3h Thrombolytic/endovascular therapy inclusion and exclusion criteria

CR.3i ICP monitoring and management parameters

CR.4 The stroke center shall have a fully functioning operating room 24/7 and appropriate qualified neurosurgical staff in-house within two hours when deemed medically necessary.

CR.4a There is documentation for any event in which neurosurgical services were not available within 90 minutes of identified need.

PC.9 Transfer Agreement

The stroke center has evidence to support that coverage for essential stroke related services is in place or arrangements (transfer agreements) have been made with another facility that provides these services.

CR.1 The stroke center shall have a written transfer protocol and a transfer agreement or a memorandum of understanding (MOU) with at least one facility capable of providing timely essential stroke related services in the event that a CSC cannot provide services within two hours, 24 hours a day, seven days a week (24/7). The transfer agreement will include:

CR.1a 24/7 emergency contact information for the acute stroke/receiving team at the authorized accepting transfer facility.

CR.1b The ability to transfer the patient 24/7, the ability of the receiving facility to accept the patient 24/7

CR.1c The ability to affect a transfer in a timely manner, as appropriate, for patient needs. Target timeframe for transfer must be identified in the transfer agreement for essential stroke related services.

CR.1d Clinical criteria for transfer and processes for obtaining consultation for transfer decisions.

CR.1e Patient monitoring personnel required during transfer, dependent on patient's condition and related to the therapy required.

CR.2 There is a written document/transfer agreement with a transportation vendor that covers ground ambulance and if utilized, air ambulance transfer.

CR.3 There shall be a protocol for bypass or diversion.

PC.10 Plan of Care

CR.1 Nursing staff shall develop a standardized plan of care for the admitted stroke patient which will include identified individual needs for the patient based on their condition and the family's needs. Documentation of interdisciplinary findings shall be included in the plan of care, as appropriate.

CR.2. Nursing staff will initiate a plan of care prepared by qualified individuals for each patient within 24 hours of admission. They will maintain an ongoing plan that reflects the input of other disciplines, as appropriate documentation of interdisciplinary findings, protocols, and plans, including but not limited to as indicated:

CR.2a Pain assessment and management, as indicated

CR.2b Vital signs and neurological assessment time frames and parameters for management:

CR.2b (1) Temperature monitoring and management
CR.2b (2) Blood pressure evaluation and management
CR.2b (3) Neurological assessments as defined by policy/order
CR.2b (4) Assess for any neurological deterioration, sudden marked changes in vital signs, changes in level of consciousness, nausea, vomiting, diaphoresis, new headache

CR.2c Cardiac monitoring, as indicated/ordered

CR.2d Positioning of head of bed as indicated/ordered

CR.2e Oxygenation

CR. 2e (1) O_2 goal greater than 94%

CR.2f Aspiration/Swallowing/Dysphagia/Oral Hygiene Protocol

Note: Patients may not be able to clear secretions and could be at high risk for aspiration.

CR.2g Fluid intake/Fluid management

Note: Fluid management is crucial for the patient with acute stroke; both volume overload and depletion should be avoided

CR.2h Patient/family stroke education on individual/modifiable risk factors as well as general risk factors.

Note: Documentation shall indicate that individualized/modifiable risk factors were identified for the patient and family.

CR.2i Potential complications specific to treatment:

- Bleeding with thrombolytic therapy (IV sites, urine, gums, skin, emesis, etc.)
- Angioedema
- Assess arterial puncture sites for signs of bleeding (pain, pallor, distal pulses, paresthesia, paralysis, limb temperature)

CR.2j Blood Glucose Monitoring

CR.2k Infection prevention

CR.2l Bowel/Bladder care, as indicated

CR.2m Mobility/Falls

CR.2n Pulmonary Embolism/DVT

Note: In immobile stroke patients without contraindications, intermittent pneumatic compression in addition to routine care (aspirin and hydration) is recommended over routine care to reduce the risk of DVT.

Note: Recommend removal of compression stockings on order sets if present.

CR.2o Skin Care

- Minimize or eliminate skin friction, to minimize skin pressure, to provide appropriate support surfaces, to avoid excessive moisture, and to maintain adequate nutrition and hydration to prevent skin breakdown.
- Regular turning, good skin hygiene, and use of specialized mattresses, wheelchair (Braden Skin Assessment)

CR.2p Nutrition

- Potential for dehydration due to reluctance to drink fluids/fear of choking
- Dehydration is a predictor of poor outcomes
- Dysphagia
- Appropriate food consistency for assessed condition
- Increased risk of respiratory complications and aspiration pneumonia

CR.3 The plan of care will include relevant co-morbidities, as indicated.

CR.4 The plan of care is updated at each phase of care and as patient's conditions changes.

CR.5 Patient and family members (or identified significant others) are involved in the planning of care, including discharge planning.

CR.6 The plan of care will include initial discharge planning for continuing care and treatment based on needs, condition and prognosis of the patient.

Note: The plan of care may be demonstrated in many forms such as: including interdisciplinary protocols, a separate document or standardized format within nursing/admission notes.

PC.11 Medication Management

CR.1 There shall be a pharmacy service that meets the needs of the patients. Medications will be administered in accordance with accepted professional principles.

CR.2 All medications shall be administered by or under the supervision of nursing or other qualified personnel in accordance with applicable State and Federal laws. All drugs and biologicals shall be administered only upon the orders of the practitioner responsible for the care of the patient in accordance with approved medical staff policies and procedures, approved protocols and accepted standards of practice.

CR.3 All compounding, packaging, and dispensing of medication shall be under the supervision of a pharmacist.

CR.4 The medical staff and/or pharmaceutical oversight group shall select and maintain a list (formulary) of medications to be available. The formulary shall be available to all appropriate staff at all times.

CR.4a The formulary will include IV thrombolytic therapy medications for treatment of ischemic stroke.

CR.4b There shall be polices/protocols in place to ensure that IV thrombolytic therapy for treatment of stroke is being used in accordance with established guidelines for administration.

CR.5 Emergency department practitioners shall have access to qualified personnel for consultation regarding the use of IV thrombolytic therapy.

CR.6 Emergency department practitioners can demonstrate safe and effective use of thrombolytics:

CR.6a Alteplase
- Indications for use
- Exclusion /contraindication criteria
- Follow manufacturer guidelines
- Administer via a dedicated IV line in which no other medications are being simultaneously injected or infused
- Excess alteplase discarded to ensure proper dosing.
- The bolus will be given over one minute and the infusion is to start immediately, within, but not to exceed five minutes after the bolus administration is completed.
- Time of bolus and time of initiation of infusion must be documented.
- Flush to complete the ordered dose must be documented.
- Physician order for normal saline flush to be infused at the same rate as dose of alteplase
- Alteplase infusion must be completed within 60 minutes to complete the ordered dose

CR.6b Tenecteplase
- Indications for use
- Exclusion /contraindication criteria
- Administer via a dedicated IV line in which no other medications are being simultaneously injected or infused
- Flush dextrose containing IV lines with normal saline prior to and following administration of tenecteplase. Precipitation may occur when tenecteplase is administered in an IV line containing dextrose.
- Reconstituted tenecteplase should be administered as a single IV bolus over five seconds
- Time of bolus shall be documented

CR.6c Monitoring protocols for identification of post thrombolytic physiological/neurological status (See PC.4 CR.4g)

CR.6d Monitor for recognition and treatment of angioedema and other adverse conditions.

CR.6e Transfer safety with medication administration/dosing: When IV alteplase administration will continue during transfer, the time will be verified for the estimated time of completion.

PC.12 Diagnostic Tests

CR.1 Diagnostic services must be in house and available 24/7 to complete and interpret initial tests within 45 minutes of being ordered.

CR.1a Documentation should include completed diagnostic studies including complete blood count, chemistries, coagulation studies, troponin, as ordered, and, when indicated, an ECG, chest x-ray, pregnancy test, etc. as indicated.

Note: If laboratory turnaround times cannot meet this target, point-of-care testing may be performed in the emergency department, according to the stroke center's policy.

Note: Baseline troponin assessment is recommended in patients presenting with AIS but should not delay initiation of IV thrombolytics.

Note: Glucose testing performed by EMS prior to arrival may be accepted, according with the policy of the stroke center and EMS services.

CR.2 Non-contrast computed tomography (CT) must be available 24/7 and Basic Magnetic Resonance Imaging (MRI) must be available, when needed, 24/7. A radiology technologist trained in CT techniques must be available in house, 24/7.

CR.2a An MRI technologist may be on call and available (but not required in house) within these parameters:

i. If using for critical decision rather than a CT, the same time frame as written for CT, must be available in house.
ii. If using for acute treatment decision, then two hours from the order is the standard.
iii. For all other purposes, the hospital can make its own determination of time frame.

CR.2b Documentation should include completed and interpreted CT exams for patients who are candidates for treatment with thrombolytics within 45 minutes.

CR.2c The brain imaging study should be interpreted by a physician with expertise in reading CT studies

CR.2d A diffusion-weighted MRI These services shall be made available 24/7 when needed.

CR.2e MR angiography (MRA). These services shall be made available 24/7 when needed.

CR.2f Catheter Angiography (CA) These services shall be made available 24/7 when needed

CR.2g Transcranial Doppler (TCD) shall be available when needed.

CR.2h Transthoracic (TTE) and Transesophageal Echocardiography (TEE) shall be available.

CR.2i Computed tomography perfusion (CTP) may be useful for guiding emergent therapy.

PC.13 Rehabilitation Services

Rehabilitation services should be implemented as soon as possible. Mobilization of the stroke survivor and resumption of self-care activities should occur as soon as medically feasible. Both inpatient and outpatient rehabilitation programs can improve outcomes and prevent deterioration.

CR.1 The CSC provides rehabilitation, physical therapy, and audiology or speech pathology services. The service(s) shall be provided in a manner that ensures the patient's health and safety.

CR.2 Post Stroke rehabilitation assessments shall focus on:

CR.2a Training for maximum recovery,

CR.2b Prevent and treat comorbid conditions,

CR.2c Enhance psychosocial coping,

CR.2d Promote integration into the community,

CR.2e Prevent recurrent strokes and other vascular events,

CR.2f Enhance quality of life.

CR.3 Rehabilitation services should be implemented as soon as possible. Mobilization of the stroke patient and resumption of self-care activities should occur as soon as medically feasible. Both inpatient and outpatient rehabilitation programs can improve outcomes and prevent deterioration.

CR.4 The stroke center shall require physical, occupational and speech therapists to be readily available 7 days per week by consultation for patient assessment and therapy during the patient

hospitalization. Consults and assessments will be completed, when possible, within 24 hours of admission or when feasible once the patient is medically stable.

Documentation in the medical record of attempts to perform a patient assessment and reason why it was not able to be performed, is required.

If the stroke center does not have inpatient rehabilitation services on site, there shall be a documented referral protocol in place and knowledge of nearby facilities offering this service. Documentation of referrals shall be in the medical record. (See QM.7 CR.4)

CR.5 Therapists, social workers, and nurse case managers must meet requirements for certification or state licensure as applicable.

CR.6 The nurse case managers and social workers must have an adequate knowledge of inpatient rehabilitation facilities and community resources in their geographic regions.

CR.7 The rehabilitation services department shall have a written treatment plan that is in accordance with orders from practitioners who are authorized by the medical staff to order rehabilitation services. The orders, treatment plan and results, notes, and other related documentation shall be maintained in the patient's medical record.

PC.14 Patient/Family/Community Education

CR.1 The stroke center will ensure that it provides for the involvement of patients and/or family members in:

CR.1a making decisions about the plan of care goals during hospitalization,

CR.1b discussing and planning for lifestyle changes to manage disease/condition,

CR.1c discussing and planning for post hospital care and needs, including possible placement.

CR.2 The CSC shall offer at least 2 annual programs to educate the public about stroke prevention, diagnosis, and/or the availability of acute therapies.

CR.3 Community outreach education programs are designed to be delivered through various means to address:

CR.3a Risk factors, signs, symptoms for stroke or other cardiovascular diseases

CR.3b General prevention efforts that target modifiable risk factors, such as smoking, obesity, diabetes, etc.

CR.3c Management of hypertension, lipid levels, atrial fibrillation, and medication adherence,

CR.3d Other issues as identified by the stroke center.

CR.4 The stroke center shall evaluate the community outreach initiatives by measuring the knowledge in the community about the causes, signs and symptoms of stroke, as well as emerging stroke prevention strategies.
(See QM.7 CR.5)

MEDICAL STAFF (MS)

MS.1 Credentialing and Privileges

CR.1 The governing body shall appoint members of the medical staff and approve clinical privileges after considering the recommendations of the members of the medical staff and ensure that the medical staff is accountable to the governing body for the quality of care provided to patients

CR.2 All individuals who are permitted by the organization and by state law to provide patient care services independently in the organization shall have delineated clinical privileges.

CR.3 There shall be a provision in the medical staff bylaws for a mechanism to ensure that all individuals with clinical privileges provide services only within the scope of privileges granted.

CR.4 The medical staff is required to develop and use criteria to review individual practitioner performance when granting and maintaining clinical privileges. Analysis of data variation shall be used to identify the need for training or proctoring that may be required.

MS.2 Stroke Program Medical Director

CR.1 The stroke program medical director for the stroke program must have significant training and expertise/knowledge as delineated in PM.1 CR.2.

CR.2 The stroke program medical director or designee shall be available 24 hours per day, 7 days per week (24/7) to provide leadership and manage medical, logistical, and administrative issues.

CR.3 The stroke program medical director shall be involved in the assessment of patients and provide consultative advice to other treating physicians.

CR.4 There shall be a written delineation of scope, coverage, authority and responsibilities of the stroke program medical director.

CR.4a If there is a co-program director identified, there shall be a written delineation of scope, coverage, authority and responsibilities of each co-director.

MS.3 Admission Requirements

Patients are admitted to the stroke unit/designated stroke beds only on the recommendation of a licensed practitioner permitted by the host hospital and the State to admit patients to the stroke program.

CR.1 The stroke program shall ensure that every patient is under the care of a:

CR.1a Doctor of Medicine or Osteopathy who may delegate such care to other qualified health care professionals to the extent allowed by State law and qualified as;

CR.1a (1) A Neurologist or Neurosurgeon, board certified or eligible
or
CR.1a (2) Physician with expertise in cerebrovascular disease
or
CR.1a (3) Other qualified professional with expertise defined by the medical staff.

CR.2 The medical staff shall ensure that:

CR.2a A Doctor of Medicine or Osteopathy with expertise in cerebrovascular disease is on duty or on call at all times.

CR.2b A Doctor of Medicine or Osteopathy is responsible for the care of each patient presenting to the stroke center with a confirmed diagnosis or signs of acute stroke at the time of admission or that develops during hospitalization.

MS.4 Consultation

CR.1 Medical professionals providing remote consultations have training and expertise to meet the host hospital requirements for telemedicine consultations.

CR.2 The medical staff shall define in its bylaws the circumstances and criteria under which consultation or management by a physician or other qualified licensed independent practitioner is required to address any co-morbidities of the patients under the care of the stroke program as required.

CR.3 Emergency Department physicians have 24-hour access to a consultation about use of thrombolytics from a physician experienced in the diagnosis and treatment of ischemic stroke.

Note: Consultation may be in person or by telemedicine.

CR.4 The stroke program should have at least one or more physicians with expertise in cerebrovascular disease on call in order to ensure 24 hours per day, 7 days per week coverage.

CR.4a One or more neurologists (preferably) with fellowship training in vascular neurology;

CR.4b Neurologist should be available to answer emergency calls per telephone/tele-video within 20 minutes; and,

CR.4c Is available in-house within 45 minutes when needed, unless covered by telemedicine services.

MS.5 Neurosurgical Services Coverage

CR.1 Neurosurgical coverage is described in a written coverage plan that includes the types of practitioners and services provided by covering neurosurgeon and any involved facilities.

CR.2 A current Neurosurgical call schedule is available in the emergency department.

CR.3 If the stroke center needs to transfer patients for neurosurgical services, the patient must leave the transferring facility within two hours of it being determined as necessary.

CR.4 Written protocols for transfer include communication from other facilities that are transferring in as well as a transfer out to another CSC facility.

CR.5 The stroke center shall have a fully functioning operating room 24/7 and appropriate qualified neurosurgical staff within a maximum of two hours when determined to be immediately needed for a patient.

CR.6 Each neurosurgeon should participate in a case review of at least 10 of their clipping cases annually.

When there are fewer than 10 cases for each practitioner, the organization may:

- receive data from another hospital where the practitioner has performed more clippings.
- If this is not possible, other types of cases reviewed and that were performed in the applicant facility and could also include but not be limited to CEAs, craniotomies, EVD placement, etc.

MS.6 ICU /Critical Care Management and Coverage

CR.1 The stroke center should have physicians with training in critical care medicine or neurocritical care for managing patient care in the ICU or neuroscience ICU in order to care for complex ischemic stroke patients as well as for hemorrhagic stroke cases and others. These clinicians shall have the following:

CR.1a Board-certified or board eligible neurologist, neurosurgeon, pulmonologist, anesthesiologist or internist who has completed either a critical care fellowship or neuro critical care fellowship; and

CR.1b Care for at least 20 patients with acute strokes per year; and

CR.1c For required education hours see SM.2 CR.4 education grid

CR.2 Intensivists/practitioners that meet criteria set by the medical staff to provide critical care coverage in the ICU that contains the dedicated neuro beds under the condition that there is a neurologist/neurosurgeon on call for consultation 24 hours a day / 7 days per week and shall be in house within 45 minutes when required, unless covered by telemedicine services.

CR.2a Criteria set by medical staff shall be in writing.

CR.2b There shall be documentation of review of individual intensivists/practitioners meeting criteria and peer review of cases.

MS.7 Endovascular Services

CR.1 CSC shall have the ability and equipment to perform revascularization procedures and microvascular surgery. The CSC will provide neurosurgical and endovascular Services for the treatment of cerebrovascular diseases including the following:

CR.1a Neuro endovascular treatment for aneurysms

CR.1b Intracranial/extracranial angioplasty (stents, balloons, retrievers, liquid embolic agents)

CR.1c Thrombectomies

CR.2 CSC shall track perioperative complications of revascularization and microvascular procedures. Perioperative complications shall be tracked prospectively.

ANESTHESIA SERVICES (AS)

AS.1 Organization

Anesthesia services, including Deep and Moderate Sedation shall be provided in an organized manner, and function under the direction of a qualified Doctor of Medicine or Osteopathy. The anesthesia service is responsible for all anesthesia services provided throughout the hospital. Areas where anesthesia services are furnished may include (but are not limited to):

- Operating room suites, both inpatient and outpatient
- Radiology department
- Emergency department
- Interventional Radiology (IR)

CR.1 Anesthesia shall only be administered by the following:

CR.1a A qualified anesthesiologist or a Doctor of Medicine or a Doctor of Osteopathy, or Nurse Anesthetist.

CR.1b The medical staff, together with anesthesia services, will define (in writing) the criteria and qualifications for those physicians and practitioners who have privileges for administering anesthesia/sedation in accordance with hospital policy, State and Federal laws and acceptable standards of practice.

CR.1c The criteria shall include, at a minimum, any required certification and/or documented proficiencies in airway management.

Note: Board Certified Emergency Room physicians are exempt per ACEP, ABEM, and AOBEM, unless the medical staff and/or host hospital requires it.

CR.2 The medical staff, together with anesthesia services, will determine appropriate qualifications for a Licensed Independent Practitioner (LIP), other than an anesthesiologist, to provide anesthesia services including deep and moderate sedation.

CR.2a Non-anesthesiologists providing anesthesia services will demonstrate proficiency in anesthesia protocols and in the administration of anesthetic medications.

CR.2b Non-anesthesiologists providing anesthesia services will demonstrate proficiency in rescue capability.

CR.2c The hospital must ensure that procedures are in place to rescue patients whose level of sedation becomes deeper than initially intended, for example, patients who inadvertently enter a state of deep sedation/analgesia when moderate sedation was intended. All personnel assisting in a procedure carried out under moderate sedation or higher must have current documented proficiency commensurate with their role.

CR.2d RNs will have documented, current ACLS or similar documented proficiency. Technicians, such as CT techs, IR techs will have documented, current BLS

AS.2 Anesthesia Services

CR.1 Anesthesia services shall be appropriate to the scope of the services offered.

CR.2 The stroke center will follow the host hospital's criteria as well as State and Federal Laws and requirements and acceptable standards of care with regard to pre-anesthesia screening and assessment and post anesthesia follow-up.

CR.3 The stroke center will assure that the anesthesiology department is notified, and the anesthesiology department follows up on cases where complications occurred and/or rescue medications were required to be used.

NURSING SERVICES (NS)

NS.1 Nursing Service

CR.1 The stroke center must have a well-organized nursing service with a plan of administrative authority and delineation of responsibilities for delivery of patient care for patients under the stroke center.

CR.2 There shall be 24-hour nursing services and a registered nurse must supervise and evaluate the nursing care for each stroke center patient. A registered nurse shall be on duty at all times.

CR.2a Nursing staff assigned to the response stroke team should have current job description available that contains the experience, educational and physical requirements, and performance expectations, including continuing education regarding the care of acute stroke patients.

Note: Stroke Center specific education and other requirements may be in an addendum to the job description, program narrative or in program specific competencies.

CR.2b The stroke center nurses' training will include, but not be limited to, care provided appropriate to the scope of service:

CR.2b (1) Nursing assessment and management of the function of ventriculostomy and external ventricular monitoring and drainage apparatus,
CR.2b (2) Treatment of increased intracranial pressure,
CR.2b (3) Nursing care of patients with ICH and SAH,
CR.2b (4) Nursing care of patients during and post thrombolytic therapy,
CR.2b (5) Treatment of blood pressure abnormalities with parenteral vasoactive agents,
CR.2b (6) Management of intubated/ventilated patients,
CR.2b (7) Detailed neurologic assessments and scales, at a minimum NIHSS and Glasgow Coma Scale.
CR.2b (8) Management of post thrombectomy and other invasive/surgical patients

Note: Training can be documented by attendance at in-service sessions, participation in regional or national courses, and other modalities, as established by the stroke center staff and the host hospital.

CR.2c CSC nurses (as defined by the organization) shall:
CR.2c (1) Be certified and/or qualified, in NIHSS or equivalent standard neurologic assessments and scales,
CR.2c (2) Have a working knowledge of the organizations stroke protocols, order sets and/or care maps,
CR.2c (3) Be familiar and involved in ongoing research projects,
CR.2c (4) Be aware of new patient care techniques related to stroke.

CR.2d Nursing staff not assigned to the stroke program, shall receive initial orientation and annual education, training and direction for identifying a stroke and, accessing the stroke team as well as basic emergency care of acute stroke patients.

CR.3 There shall be adequate numbers of licensed registered nurses, licensed practical nurses, supervisory, and other staff to provide nursing care to all patients of the stroke center as needed. A registered nurse must be immediately available for the bedside care of every patient, as required by State and Federal law.

CR.3a The nurse to patient ratio in the stroke unit/dedicated beds for care of stroke patients should be 1:3 or 1:4. This may be modified accordingly based on both volume and acuity of patients.

Note: As staffing patterns are usually 1:2 in ICUs, the above number does not denote that a higher ratio should apply in ICU.

CR.4 A registered nurse shall make any decisions regarding delegation of nursing care to other nursing staff, based on individual patient need and staff qualifications.

CR.5 Non-employee licensed nurses who are working in the stroke program must adhere to the policies and procedures of the program. The director of the stroke program must provide for the adequate supervision and evaluation of the clinical activities of non-employee nursing personnel that occur within the responsibility of the nursing service.

CR.6 Each stroke program nurse coordinator/manager should attend a national or regional meeting every other year that focuses on some aspect of cerebrovascular disease.

STAFFING MANAGEMENT (SM)

SM.1 Personnel

Personnel performing work in the stroke center, shall be competent based on the requirements for appropriate education, training, skills and experience.

CR.1 The stroke center shall have a policy and practice for outlining and verifying that each staff member possesses a valid and current license or certification as required by the stroke center and Federal and State law.

SM.2 Competence, Training and Awareness

The stroke center shall:

CR.1 Determine the necessary competencies for personnel in the stroke center.

CR.2 Have documented evidence to demonstrate initial orientation and ongoing training in the care of acute stroke patients for individuals assigned to the stroke center patients.

CR.3 Where applicable, provide training or take other actions to achieve the necessary competence.

CR.4 At least annually, provide continuing education or other equivalent educational activity to staff members as appropriate to the care practitioners' level of responsibility.
(See Annual Stroke Education and Training Table below.)

SM.2 CR.4 Annual Stroke Education and Training Table

PLEASE NOTE: One grid cannot completely capture all the positions in all the hospitals that may have some responsibility for stroke patients. We expect that if your organization has a title or a person who is not on this grid, that you will read the grid and find the area that most closely matches who you are trying to find. Decide amongst yourselves and be able to tell us why you chose that number of hours. Most likely, there are no wrong answers here if your team has decided and you are comfortable with your decision that was based on your own criteria.

Position	Annual Hours	Notes
Stroke Core Team*		
Stroke Medical Director Nurse Stroke Coordinator Stroke Advanced Practice Provider	8 PSC, PSC+, CSC stroke education hours 4 ASR stroke education hours	Stroke Advanced Practice Providers May include: Nurse Practitioner Stroke-certified nurse Masters prepared clinical nurse specialist Physician Assistant *Stroke Advanced Practice Provider not required on Core Team for ASR, PSC and while not required, desirable for PSC+ and required for CSC
Stroke Quality Representative	4 ASR, PSC, PSC+, CSC stroke education hours	The Stroke Quality Representative is a required member of the Stroke Core Team. If the Quality Representative is also the Nurse Stroke Coordinator, then the 8 hours of annual stroke education applies. *May include others as identified by stroke Leadership
Acute Stroke Team (AST)/Response Team	8 stroke education hours	This education requirement is for direct care members of the AST who respond to Stroke Codes/Alerts. The organization can delineate education requirements for other members of the Stroke Team (i.e., Social Service, Dietician, etc.).
Rapid Response Team (RRT)	8 stroke education hours Stroke Alert Protocol	If rapid response teams answer in-house stroke alerts, at least one member of the rapid response team must meet the education requirement of the AST and be included on the stroke committee. All Rapid Response Team members will have training on the stroke alert protocol, identification of stroke and use of hospital required stroke identification tools (i.e., NIHSS)

Position	Annual Hours	Notes
Neuro-Interventionalist Neuro-Interventional Radiologists Endovascular Neurosurgeons Neurologists Neurosurgeons Neuro-Intensivists	6 hours of stroke specific education over the course of an individual practitioners' two-year credentialing cycle. 9 education hours if the credentialing cycle is 3 years	Any practitioner that is not specified in this grid and works with the stroke patients needs to be included in this category. Applies only to these practitioners who provide their specialty services to the stroke center. (i.e., a hospital may have 20 neurosurgeons but only 2 provide services to the stroke program)
Emergency Department Physicians Hospitalists Intensivists Stroke Advance Practice Providers*	6 hours of stroke specific education over the course of an individual practitioners' two-year credentialing cycle. 9 education hours if the credentialing cycle is 3 years	Medical staff might require further neuro specific training (i.e., ENLS or equivalent.) depending on an evaluation by the medical staff of individual practitioners training and experience. This applies only to those hospitalists, intensivists and advanced practice providers that care for stroke patients. *Stroke Advanced Practice Providers May include: Nurse Practitioner Stroke-certified nurse Masters prepared clinical nurse specialist Physician Assistant
Emergency Department Nurse Manager ICU Nurse Manager Stroke Unit Nurse Manager Step Down Unit Nurse Manager NIHSS Requirement	6* stroke education hours	If clinical supervision is assigned to a stroke resource nurse (i.e., nurse educator) rather than a nurse manager, the resource nurse must then meet the educational requirement of 6 hours. *ASR 6 hours applies only if patients are admitted for more than end of life/comfort measures *ASR 2 hours applies only if patients are admitted for end of life/comfort measures * Applicable to any unit routinely admitting stroke patients and not just an occasional admit

Position	Annual Hours	Notes
Neuro-Dedicated -ICU RNs Stroke Unit Step Down Mixed Population ICU RNs NIHSS Requirement	6* stroke education hours	Requirement is for those nurses who work with stroke patients, not necessarily all neuro patients *ASR—6 hours apply only if stroke patients are admitted for more than end of life/comfort measures *ASR 2 hours applies only if patients are admitted for end of life/comfort measures * applicable to any unit routinely admitting stroke patients/not just an occasional admit
ED nurses PACU Nurses* Interventional nurses Interventional techs NIHSS Requirement	4 stroke education hours	Nurses/techs that work in these settings with stroke patients *(PACU only if utilized for stroke patients-post thrombectomy/clipping/coiling/other interventions)
Pharmacists Pharmacy Technicians	2 stroke education hours	For Pharmacy—All who are involved with the stroke program and/or preparation of thrombolytics.
Rehabilitation Therapists	2* education hours	For rehab—All who work with or are assigned to stroke patients (OT, PT, SLP) *ASR—applies only if stroke patients are admitted for more than end of life/comfort measures
Nurses not assigned to stroke units such as Med Surg, Obstetrics, etc.	1 education hour	Should include, but not be limited to: Recognition of stroke signs and symptoms and policy/process for in-house stroke alert.
All other staff (clinical and non-clinical)	1 stroke recognition/awareness activity	FAST, BEFAST training (or equivalent) could be an option and would be acceptable;
PLEASE NOTE: One grid cannot completely capture all the positions in all the hospitals that may have some responsibility for stroke patients. We expect that if your organization has a title or a person who is not on this grid, that you will read the grid and find the area that most closely matches who you are trying to find. Decide amongst yourselves and be able to tell us why you chose that number of hours. Most likely, there are no wrong answers here if your team has decided and you are comfortable with your decision that was based on your own criteria.		

CR.5 Maintain appropriate records of education, training, skills and experience.

Note: This annual requirement may be met in a variety of ways, including online continuing medical credits, attendance at grand rounds, regional and national meetings and various educational courses. Education should be specifically related to diagnosis / assessment and management of acute stroke / cerebrovascular disease (may be policy / competency driven).

Note: The stroke center may determine which personnel are required to receive the minimum hours of education and training. It is at the discretion of the stroke center to exclude any personnel, with justification, when they are not specifically dedicated to the stroke center.

SM.3 Determining and Modifying Staffing

CR.1 The stroke center shall develop a method for determining and modifying staffing.

SM.4 Job Description

CR.1 All personnel, whether clinical or supportive, including contract staff, shall have available a current job description that contains the experience, educational and physical requirements, and performance expectations for that position.

Note: Stroke center specific requirements may be in an addendum to the job description, program narrative or in program specific competencies.

SM.5 Orientation

CR.1 All personnel, whether clinical or supportive, including contract staff, shall receive an orientation to specific job duties and responsibilities, and their work environment, as required by hospital policy, State and Federal law. The stroke center shall determine orientation content that must take place prior to the individual functioning independently in their job.

SM.6 Staff Evaluations

CR.1 The performance/competency evaluation shall contain indicators that will objectively measure the ability of staff to perform all job duties as outlined in the job description, hospital policies and any additional stroke program specific competencies.

CR.2 The staff shall be evaluated initially and on an on-going basis.

CR.3 The stroke center shall follow the host hospital requirement that each staff member, including contract staff, participate in continuing education as required by individual licensure/certification, professional association, law or regulation.

PATIENT RIGHTS (PR)

PR.1 Specific Rights

The stroke center shall protect and promote each patient's rights as required by the host hospital policies. The stroke center shall inform, whenever possible, each patient and/or legal representative (as allowed under State law) of the patient's rights in advance of providing or discontinuing care and allow the patient to exercise his or her rights accordingly. The written listing of these rights shall be provided to the patient and /or family and shall include policies and procedures that address the following:

CR.1 Patient and/or family participation and means for making informed decisions regarding their plan of care;

CR.2 Information to the patient or family of patient and to involve the patient and family to make informed decisions regarding their planning for care and treatment, including the requesting and/or refusing treatment, their health status, not to be construed as a demand for the provision of treatment or services deemed medically unnecessary or inappropriate.

CR.3 Personal privacy;

CR.4 Provision of care in a safe setting;

CR.5 Confidentiality of clinical records;

CR.6 Procedure for submission of a written or verbal grievance. (See PR.5 Grievance Procedure)

CR.7 Pain Management.

PR.2 Advance Directive

The stroke center must allow the patient to formulate advance directives and to have stroke center staff and practitioners comply with the advance directives in accordance and in participation with the host hospital policies as well as State and Federal law, rules and regulations.

PR.3 Language and Communication

The stroke center shall communicate with the patient and/or legal representative in language or format that the patient and/or legal representative understand.

CR.1 The stroke center, through the host hospital policy and practice, provides for competent individuals to interpret the patient's language for individuals who do not speak English or provide alternative communication aids for those who are deaf, blind, or otherwise impaired.

PR.4 Informed Consent

CR.1 The stroke center shall obtain an informed consent from each patient or authorized representative for the provision of medical care under the stroke center. The consent shall include an explanation of risks, benefits, and alternatives for procedures, diagnostic tests, and participation in activities related to the stroke center, as defined by the medical staff, State and Federal law. Unless required by local practices, a signed informed consent document is not required.

CR.2 If the patient lacks capacity and no patient representative can be found after a reasonable effort, then the physician may administer the medication based on the principle of implied consent for emergency treatment. The physician shall document the patient's absence of decision-making capacity, that attempts to contact a patient representative were unsuccessful, and that there is an urgent medical need to proceed with treatment in the absence of consent.

Note: Regardless of whether written or verbal consent is required, physicians shall document the informed consent discussion in the medical record.

CR.3 Informed consent for thrombectomy, CEA, stroke related or other surgical interventions shall follow the rules of the host hospital, State and Federal other applicable local laws.

PR.5 Grievance Procedure

The stroke center shall participate in and follow the host hospital formal grievance process and procedure for submission of a patient's written or verbal grievance.

MEDICAL RECORDS (MR)

MR.1 Organization

CR.1 Administrative responsibility for medical records shall rest with the medical record service of the host hospital. This includes paper records, electronic medical records and any reports from other sources such as patient transfer documents.

CR.2 The stroke center shall maintain the host hospitals policies on an accurately recorded, promptly completed medical record for all patients in the organizations system.

CR.3 The host hospital organization shall have a process for providing services for the completion, filing, and retrieval of medical records. The process for completion of the medical record must address timeframes.

CR.4 Authenticity and security of all record entries shall be safeguarded.

MR.2 Confidentiality

CR.1 Confidentiality of patient records shall be assured.

CR.2 Individuals who are authorized by the patient to receive information from or copies of records shall follow processes designed to protect improper or inadvertent release of private information to unauthorized individuals.

CR.3 The organization shall ensure that the medical record cannot be altered or accessed by unauthorized individuals.

MR.3 Record Content

CR.1 The medical record shall contain information to:

CR.1a Justify treatment, admission and/or continued hospitalization

CR.1b Support the diagnosis; and,

CR.1c Describe the patient's progress and response to all medications and services provided.

CR.2 All entries shall be:

CR.2a Legible, complete, dated and timed; and,

CR.2b Authenticated by the person responsible for providing or evaluating the services provided consistent with the host hospital and stroke center policy.

Note: Authentication may include written signatures or initials. Electronic authentication is permissible.

CR.3 The stroke center shall follow the host hospital system to identify the author of each entry into the medical record.

CR.4 All orders must be dated, timed and authenticated promptly by the prescribing practitioner.

CR.5 Verbal orders must be in accordance with State and Federal law and authenticated by the practitioner, or a practitioner responsible for the care of the patient, within time frame required by the host hospital and/or State and Federal law.

CR.5a Telephone or verbal orders are to be used infrequently and when used must be accepted only by personnel authorized by the medical staff and in accordance with State and Federal law.

MR.4 Required Documentation

CR.1 All records must document the following, as appropriate.

CR.1a Evidence of a physical examination, including a health history must be performed on all patients admitted for inpatient care and/or prior to surgery or procedure requiring anesthesia services, except in emergencies.

CR.1b Admitting diagnosis (if admitted),

CR.1c Results of all consultative evaluations of the patient and appropriate findings by clinical and other staff involved in the care of the patient,

CR.1d Documentation of complications, organization acquired infections, and unfavorable reactions to drugs and anesthesia,

CR.1e Properly executed informed written consent forms for procedures and treatments specified by the medical staff, or by State and Federal law if applicable, signed by the patient or their authorized representative,
(See PR.4 for informed consent policy),

CR.1f All practitioners' orders, nursing notes, assessments, reports of treatment, medication administration, radiology, laboratory reports, vital signs and any other information necessary to diagnose, treat or monitor the patient's condition.

CR.2 Documentation indicating reason if an eligible ischemic stroke patient does not receive IV thrombolytic therapy.

CR.3 Documentation indicating the assessments of all stroke patients, whether they received IV thrombolytic therapy or not, to determine the eligibility/recommendation for endovascular intervention.

CR.4 Assessments, re-assessments, interventions and monitoring (i.e., post thrombolytics / post endovascular procedures) per protocol and/or hospital policy.

CR.5 Discharge summary with outcome of hospitalization, disposition of case, and provisions for follow up care.

PHYSICAL ENVIRONMENT (PE)

PE.1 The stroke center shall participate in the facility and safety management systems for maintaining the physical environment in place under the operation of the host hospital, including applicable National Fire Protection Association (NFPA) standards, applicable CMS Conditions of Participation and any additional accreditation organization (AO) requirements.

ADDENDUM A: DNV COMPREHENSIVE STROKE CENTER METRICS FOR MEASURING PROCESSES AND QUALITY

QM.9 Metrics for Measuring Quality of CSC Care

The CSC Program shall ensure that it provides the following core quality metrics that are listed in Metrics for Measuring Quality of Care in Comprehensive Stroke Centers American Heart Association/American Stroke Association Recommendations: A Statement for Healthcare Professionals from the Detailed Follow-Up to Brain Attack Coalition Comprehensive Stroke Center Stroke 2011, 42:849-877.

For Get With The Guidelines crosswalk CSTKs to DNV metric numbers and description of the metrics, please **see Addendum B.**

CR.1
Metric 1: Percent of all ischemic, hemorrhagic stroke /TIA patients who have a deficit at the time of the initial RN note, ED Physician or Neurology consultation note for whom an NIHSS score is documented.

Numerator:
Number of patients with an ischemic, hemorrhagic stroke or TIA with a deficit at the time of the initial admitting note (or neurological consultation note) for whom an NIHSS is documented.

Denominator:
All patients who have a suspected ischemic, hemorrhagic stroke or TIA.

CR. 2
Metric 2:
Percent of acute ischemic stroke patients who arrive at the hospital within 210 minutes (3.5 hours) of time last known well and for whom IV thrombolytic was initiated at this hospital within 270 minutes (4.5 hours) of time last known well.

Numerator:
Patients who arrive within 3.5 hours of last known well are candidates for thrombolytics up to 4.5 hours since last known well and are treated with thrombolytics within this time, are to be included in the numerator.

Denominator:
Patients who arrive within 3.5 hours of last known well and are candidates for thrombolytics up to 4.5 hours after last known well are included in the denominator.

Note: For patients with an in-hospital stroke, the time of arrival should be the time that the deficit was first discovered.

Patients who are transferred to the CSC after thrombolytics are started at another hospital, should be excluded from this metric for the receiving CSC, unless the CSC was consulted on diagnosis and treatment.

CR. 4
Metric 4:
Time from arrival to the start of advanced (CTA, CTP, MRA, MRI) imaging workup for all patients who arrive within 24 hours of last known well.

No numerator/denominator

Note: Advanced imaging includes, but not limited to, CTA/CTP, MRI/MRA. Patients should be excluded from this if there is a documented reason for not performing imaging quickly. For patients with an in-hospital stroke, the time of arrival should be the time that the deficit was first discovered.

CR.6
Metric 6:
Median time from hospital arrival to the time of skin puncture to access the artery (e.g., brachial, carotid, femoral, radial) selected for endovascular treatment (EVT) of acute ischemic stroke.

No numerator/denominator

Note: The start of treatment is defined here as the time of skin puncture to access the artery selected for endovascular treatment, (e.g. brachial, carotid, radial, femoral) or intra-arterial thrombolytic infusion, of acute ischemic stroke.

Metric 6a:
Median time from hospital arrival to the time of skin puncture to access the artery (e.g., brachial, carotid, femoral, radial) selected for endovascular treatment (EVT) of acute ischemic stroke in patients who are transferred from another hospital.

No numerator or denominator

Metric 6b:
Median time from hospital arrival to the time of skin puncture to access the artery (e.g., brachial, carotid, femoral, radial) selected for endovascular treatment (EVT) of acute ischemic stroke in patients who present directly to your hospital OR mode of arrival not documented.

No numerator or denominator

Note: For patients with an in-hospital stroke, the time of arrival should be the time that the deficit was first discovered.

CR.7
Metric 7:
Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration greater than or equal to 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within (less than or equal to) 36 hours after the onset of treatment with intra-venous (IV) or intra-arterial (IA) thrombolytic therapy, or mechanical endovascular reperfusion procedure (i.e., mechanical endovascular thrombectomy with a clot retrieval device).

Numerator:
Ischemic stroke patients who develop a symptomatic intracranial hemorrhage less than or equal to 36 hours after the onset of treatment with IV thrombolytic therapy, or IA thrombolytic therapy, or mechanical endovascular reperfusion therapy

Denominator:
Ischemic stroke patients treated with IV thrombolytic therapy only or IA thrombolytic therapy, or who undergo mechanical endovascular reperfusion therapy

CR. 7a
Metric 7a:
Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration greater than or equal to a 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within less than or equal to 36 hours after the onset of treatment with intra-venous (IV) thrombolytic therapy only

Numerator:
Ischemic stroke patients who develop a symptomatic intracranial hemorrhage less than or equal to 36 hours after the onset of treatment with IV thrombolytic therapy only

Denominator:
Ischemic stroke patients treated with IV thrombolytic therapy only

CR. 7b
Metric 7b:
Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration greater than or equal to a 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within less than or equal to 36 hours after the onset of treatment with IA thrombolytic therapy or mechanical endovascular reperfusion therapy (i.e., mechanical endovascular thrombectomy with a clot retrieval device).

Numerator:
Ischemic stroke patients who develop a symptomatic intracranial hemorrhage less than or equal to 36 hours after the onset of treatment with IA thrombolytic therapy or mechanical endovascular reperfusion therapy

Denominator:
Ischemic stroke patients treated with IA thrombolytic therapy or mechanical endovascular reperfusion therapy

CR. 9
Metric 9:
Percent of acute ischemic stroke patients who are treated with intravenous thrombolysis or who undergo endovascular recanalization procedure for whom there is documentation of a 90-day mRS score.

Numerator:
All patients with ischemic stroke acutely treated with intravenous thrombolysis or with an endovascular recanalization procedure who had an mRS performed approximately 90 days after discharge, either in person or by telephone if it was not possible to perform in person.

Denominator:
All patients admitted with ischemic stroke acutely treated with intravenous thrombolysis or with an endovascular recanalization procedure.

Note: The mRS should be conducted by a trained person using a standardized interview. The mRS may be based on information obtained from the patient, family member or caregiver. The mRS should be performed within 2 weeks of the date (before or after) at which it has been 90 days after hospital discharge.

CR.12
Metric 12:
Subarachnoid hemorrhage (SAH) and intracerebral hemorrhage (ICH) stroke patients for whom a severity measurement (i.e., Hunt and Hess Scale for SAH patients or ICH Score for ICH patients) is performed prior to surgical intervention (e.g. clipping, coiling, or any surgical intervention) and documented in the medical record; **OR**
documented within 6 hours of arrival at the hospital emergency department for patients who do not undergo surgical intervention.

Numerator:
The number of SAH patients for whom the Hunt and Hess Scale is documented and the number of ICH patients for whom the ICH Score is documented in the medical record prior to surgical intervention.
OR
documented within 6 hours of hospital arrival for patients who do not undergo surgical intervention.

Denominator:
The sum of the number of SAH patients and the number of ICH patients admitted for acute care. Patients admitted directly to “Comfort Care” or “Hospice” may be excluded.

Note: For a patient to be counted in the numerator, the Hunt and Hess for SAH patients and the ICH scores for the ICH patients should be documented in the initial neurological or neurosurgical admitting or consultation note or in a separate earlier note and should be evaluated before the start of any endovascular or surgical procedure.

Note: This combined ratio should be calculated as the primary metric, but separate ratios should also be calculated for each scale.

CR.12a
Metric 12a:
SAH stroke patients for whom a severity measurement is performed prior to surgical intervention and documented in the medical record; **OR**
documented within 6 hours of hospital arrival for patients who do not undergo surgical intervention.

Numerator:
The number of SAH patients for whom the Hunt and Hess Scale is performed prior to surgical intervention and documented in the medical record; **OR**
documented within 6 hours of hospital arrival for patients who do not undergo surgical intervention.

Denominator:
The number of SAH patients that were admitted for acute care. Patients admitted directly to “Comfort Care” or “Hospice” may be excluded.

CR.12b
Metric 12b
ICH stroke patients for whom a severity measurement is performed prior to surgical intervention and documented in the medical record; **OR**
documented within 6 hours of hospital arrival for patients who do not undergo surgical intervention.

Numerator:
The number of ICH patients for whom the ICH score is performed prior to surgical intervention and documented in the medical record; **OR**
documented within 6 hours of hospital arrival for patients who do not undergo surgical intervention.

Denominator:
The number of ICH patients that were admitted for acute care. Patients admitted directly to “Comfort Care” or “Hospice” may be excluded.

CR.15
Metric 15:
Percentage of patients with documented aneurysmal SAH for whom Nimodipine treatment (60 mg every 4 hours or 30 mg every 2 hours) is started within 24 hours of diagnosis and for whom such treatment is continued until 21 days after the hemorrhage or until discharge if they are discharged less than 21 days after the SAH.

Numerator:
Patients with documented aneurysmal SAH treated with Nimodipine 60 mg every 4 hours (or 30 mg every 2 hours) within 24 hours of diagnosis and who continue this treatment until 21 days after their hemorrhage, or until discharge if they are discharged less than 21 days after the SAH, or until they develop a contraindication to Nimodipine.

Denominator:
All patients with a diagnosis of aneurysmal SAH.

Note: Acceptable contraindications include documentation of intractable hypotension or allergy to Nimodipine.

Patients whose dose of Nimodipine is reduced or discontinued during the hospital stay because of hypotension or other reasons, will be documented by the provider to be considered in compliance with this metric.

Patients who have a known contraindication to Nimodipine and are therefore not treated with it will also be considered to be in compliance with this metric.

CR.18
Metric 18:
Complication rates for aneurysm endovascular and/or surgical treatment

Numerator:
Patients undergoing endovascular and/or surgical treatment of a ruptured or un-ruptured brain aneurysm who have complications of death, stroke or bleeds within 24 hours of the procedure or any re-bleeding and/or second treatment for residual aneurysm within 30 days of the procedure.

Denominator:
All patients undergoing endovascular and/or surgical treatment of a ruptured or un-ruptured brain aneurysm.

CR.18a
Metric 18a Numerator:
Patients with unruptured brain aneurysms undergoing endovascular treatment with complications.

Denominator:
All patients undergoing endovascular treatment of an unruptured brain aneurysm

CR.18b
Metric 18b Numerator:
Patients with a ruptured brain aneurysm undergoing endovascular treatment with complications

Denominator:
All patients undergoing endovascular treatment of a ruptured brain aneurysm

CR.18c
Metric 18c Numerator:
Patients with unruptured brain aneurysms undergoing surgical treatment with complications

Denominator:
All patients undergoing surgical treatment of an unruptured brain aneurysm

CR.18d
Metric 18d Numerator:
Patients with ruptured brain aneurysms undergoing surgical treatment with complications

Denominator:
All patients undergoing surgical treatment of a ruptured brain aneurysm

Note: Bleeding complications should be classified by pre-procedural (such as bleeding leading to herniation), procedural, and post procedural if within the first 30 days. The three distinct classifications of bleeds should be tracked separately.

CR.20
Metric 20:
Percent of patients undergoing surgical or endovascular treatment of an AVM with stroke or death within 30 days of the procedure.

Numerator:
Patients undergoing surgical or endovascular treatment of an AVM with new intracranial hemorrhage or ischemic stroke or death within 30 days of the procedure.

Denominator:
All patients undergoing surgical or endovascular treatment of an AVM.

CR.24
Metric 24:
Percent of patients who have a diagnosis of ischemic or hemorrhagic stroke who undergo external ventricular drain (EVD) and then develop ventriculitis.

For this metric, ventriculitis is defined as the presence of positive cerebrospinal fluid cultures in a patient with EVD if there is no documentation in the medical record stating that the culture results are thought to be the result of a contaminant or of some other process (e.g., preexisting infection or infection resulting from another surgical procedure).

Numerator:
All diagnosed stroke patients who developed ventriculitis after EVD placement.

Denominator:
All diagnosed stroke patients who undergo EVD placement.

CR. 27
Metric 27
Ischemic stroke patients with a post-treatment reperfusion grade of TICI 2B or higher in the vascular territory beyond the target arterial occlusion at the end of mechanical endovascular reperfusion therapy.

Numerator:
Ischemic stroke patients with a post-treatment reperfusion grade of TICI 2B or higher

Denominator:
All ischemic stroke patients treated with mechanical endovascular reperfusion therapy.

CR.28
Metric 28:
Ischemic stroke patients with a large vessel cerebral occlusion (i.e., internal carotid artery (ICA) or ICA terminus (T-lesion; T-occlusion), middle cerebral artery (MCA) M1 or M2, basilar artery) who receive mechanical endovascular reperfusion (MER) therapy (time of first pass or deployment of device) within 120 minutes of hospital arrival and achieve TICI 2B or higher at the end of treatment

Numerator:
Ischemic stroke patient who achieve TICI 2B or higher for the primary vessel occlusion within 120 minutes of hospital arrival

Denominator:
Ischemic stroke patients treated with mechanical endovascular reperfusion therapy for a large vessel occlusion (LVO)

CR.29
Metric 29:
Ischemic stroke patients with a large vessel cerebral occlusion (i.e., internal carotid artery (ICA) or ICA terminus (T-lesion; T-occlusion), middle cerebral artery (MCA) M1 or M2, basilar artery) who receive mechanical endovascular reperfusion (MER) therapy and achieve TICI 2B or higher less than or equal to 60 minutes from the time of skin puncture.

Numerator:
Ischemic stroke patients who achieve TICI 2B or higher for the primary vessel occlusion less than or equal to 60 minutes from the time of skin puncture.

Denominator:
Ischemic stroke patients treated with mechanical endovascular reperfusion therapy for a large vessel occlusion (LVO)

ADDENDUM B: DNV / GWTG Data Crosswalk Utilize if the organization enters data into the AHA/ASA GWTG Patient Management Tool			
Required DNV QM.9 Metric	**DNV Accepts GWTG Definition**	**Equivalent GWTG Measure**	**GWTG Definition**
Metric 1	**No** - Utilize CR.1 Metric 1	NA	NA
Metric 2	Yes	ASA Definition	Percent of acute ischemic stroke patients who arrive at the hospital within 210 minutes (3.5 hours) of time last known well and for whom IV thrombolytic was initiated at this hospital within 270 minutes (4.5 hours) of time last known well.
Metric 4	No - Utilize CR.4 Metric 4	NA	NA
Metric 6	Yes	CSTK-09	Median time from hospital arrival to the time of skin puncture to access the artery (e.g., brachial, carotid, femoral, radial) selected for endovascular treatment (EVT) of acute ischemic stroke.
Metric 6a	Yes	CSTK-09a	Median time from hospital arrival to the time of skin puncture to access the artery (e.g., brachial, carotid, femoral, radial) selected for endovascular treatment (EVT) of acute ischemic stroke in patients who are transferred from another hospital.

Required DNV QM.9 Metric	DNV Accepts GWTG Definition	Equivalent GWTG Measure	GWTG Definition
Metric 6b	Yes	CSTK-9b	Median time from hospital arrival to the time of skin puncture to access the artery (e.g., brachial, carotid, femoral, radial) selected for endovascular treatment (EVT) of acute ischemic stroke in patients who present directly to your hospital, OR mode of arrival not documented.
Metric 7	Yes	CSTK-05	Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration greater than or equal to 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within less than or equal to 36 hours after the onset of treatment with intra- venous (IV) or intra-arterial (IA) thrombolytic (t-PA) therapy, or mechanical endovascular reperfusion procedure (i.e., mechanical endovascular thrombectomy with a clot retrieval device).
Metric 7a	Yes	CSTK-05A	Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration greater than or equal to 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within less than or equal to 36 hours after the onset of treatment with intra- venous (IV) thrombolytic (t- PA) therapy only

Required DNV QM.9 Metric	DNV Accepts GWTG Definition	Equivalent GWTG Measure	GWTG Definition
Metric 7b	Yes	CSTK-05B	Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration greater than or equal to 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within less than or equal to 36 hours after the onset of treatment with IA thrombolytic (t-PA) therapy or mechanical endovascular reperfusion therapy (i.e., mechanical endovascular thrombectomy with a clot retrieval device).
Metric 9	**No** - Utilize CR.9 Metric 9 (not available in GWTG)	NA	NA
Metric 12	Yes	CSTK-03	Subarachnoid hemorrhage (SAH) and intracerebral hemorrhage (ICH) stroke patients for whom a severity measurement (i.e., Hunt and Hess Scale for SAH patients or ICH Score for ICH patients) is performed prior to surgical intervention (e.g. clipping, coiling, or any surgical intervention) in patients undergoing surgical intervention and documented in the medical record; OR documented within 6 hours of arrival at the hospital emergency department for patients who do not undergo surgical intervention.
Metric 12a	Yes	CSTK-03a	SAH stroke patients for whom a severity measurement is performed prior to surgical intervention in patients undergoing surgical intervention and documented in the medical record; OR documented within 6 hours of hospital arrival for patients who do not undergo surgical intervention.

Required DNV QM.9 Metric	DNV Accepts GWTG Definition	Equivalent GWTG Measure	GWTG Definition
Metric 12b	Yes	CSTK-03b	ICH stroke patients for whom a severity measurement is performed prior to surgical intervention in patients undergoing surgical intervention and documented in the medical record; OR documented within 6 hours of hospital arrival for patients who do not undergo surgical intervention.
Metric 15	**No** - Utilize CR.15 Metric 15 (DNV metric more detailed than GWTG)	NA	NA
Metric 18	**No** - Utilize CR.18 Metric 18 (not available in GWTG)	NA	NA
Metric 18a	**No** - Utilize CR.18a Metric 18a (not available in GWTG)	NA	NA
Metric 18b	**No** - Utilize CR.18b Metric 18b (not available in GWTG)	NA	NA
Metric 18c	**No** - Utilize CR.18c Metric 18c (not available in GWTG)	NA	NA
Metric 18d	**No** - Utilize CR.18d Metric 18d (not available in GWTG)	NA	NA
Metric 20	**No** - Utilize CR.20 Metric 20 (not available in GWTG)	NA	NA
Metric 24	**No** - Utilize CR.24 Metric 24 (not available in GWTG)	NA	NA
Metric 27	Yes	CSTK-08	Ischemic stroke patients with a post-treatment reperfusion grade of TICI 2B or higher in the vascular territory beyond the target arterial occlusion at the end of mechanical endovascular reperfusion therapy

Required DNV QM.9 Metric	DNV Accepts GWTG Definition	Equivalent GWTG Measure	GWTG Definition
Metric 28	Yes	CSTK-11	Ischemic stroke patients with a large vessel cerebral occlusion (i.e., internal carotid artery (ICA) or ICA terminus (T-lesion; T-occlusion), middle cerebral artery (MCA) M1 or M2, basilar artery) who receive mechanical endovascular reperfusion (MER) therapy within 120 minutes (>/= 0 min. and </= 150 min.) of hospital arrival and achieve TICI 2B or higher at the end of treatment.
Metric 29	Yes	CSTK-12	Ischemic stroke patients with a large vessel cerebral occlusion (i.e., internal carotid artery (ICA) or ICA terminus (T- lesion; T-occlusion), middle cerebral artery (MCA) M1 or M2, basilar artery) who receive mechanical endovascular reperfusion (MER) therapy and achieve TICI 2B or higher less than (<) or equal to 60 minutes from the time of skin puncture.

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Revision 22-1 01-01-2022