



DNV GL HEALTHCARE

# COMPREHENSIVE STROKE CENTER CERTIFICATION PROGRAM REQUIREMENTS

Version 18-0

DNV GL Healthcare USA, Inc.  
400 Techne Center Drive, Suite 100  
Milford, OH 45150  
Phone 513-947-8343 • Fax 513-947-1250



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## Effective Date

Comprehensive Stroke Center Certification Requirements (CSC), Version 18-0.

Effective Date: October 1, 2018.

### **Please Note:**

New metrics that have been added will be expected to start collection from October 2018 and will be surveyed starting January 2019. All other metrics will continue to be surveyed with no break except for the retired metrics.

All new requirements and changes are italicized and 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 GL Healthcare.

*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 GL 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 in to 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 GL Healthcare USA, Inc. (DNV GL HC) 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 and most recently, the World Stroke Organization

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, Level 1 CSCs function as a resource center for other facilities in their region, such as Primary Stroke Centers (PSC), *Primary Plus Centers (PSC Plus is DNV GL's thrombectomy capable centers)* and Acute Stroke Ready Hospitals (ASRs). This might include providing expertise about managing cases, offering guidance for triage of patients, making diagnostic tests or treatments available to patients treated initially at a PSC, and being an educational resource for other hospitals and health care professionals.

## Regulatory and Policy Reference

- The DNV GL 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 in compliance with 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 GL or another accreditation organization, approved by CMS to deem healthcare organizations in compliance with the CoPs. (For American Hospitals, only)

This Certification Program addresses healthcare organizations that are either applying for DNV GL Healthcare. for certification of the Comprehensive Stroke Certification (CSC) Program or are currently certified by DNV GL.

When a healthcare organization has applied for but not received DNV GL certification, it is referred to as an "Applicant Organization." When a healthcare organization is currently certified by DNV GL, it is referred to as a "Certified Organization."

The Certification Assessment is conducted separate and apart from a DNV GL 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 on-site 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:

- Meet the requirements of a Primary Stroke Center and have current certification for at least one year.
- OR
- If an organization is a Primary+ organization, they must have current certification as a PSC for at least one year and at least 4 months as a PSC+ for initial eligibility.
- Are in current compliance with all Medicare Conditions of Participation at the time of application and at the time of the survey.
- Validate adequate case volume of *15 thrombectomies* for the initial application year.
- Provide care to 20 or more patients per year with a diagnosis of subarachnoid hemorrhage.
- Accomplished at least 10 endovascular coiling or surgical clipping (may combine numbers) procedures per year for aneurysm treatment.
- Have administered IV Alteplase to an average of 25 eligible patients over a two-year time frame.
- Have performed 25 thrombectomies over a two-year period*

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

If the patient is not transferred to the CSC, but there is evidence of follow up monitoring, that patient may also be counted in the eligibility number.

(These cases must be added to the programs indicators tracking to be included 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)*
- Magnetic resonance imaging (MRI) including diffusion weighted
- Magnetic resonance angiography (MRA)
- Carotid duplex ultrasound
- Extracranial ultrasonography
- Transcranial Doppler



- Transesophageal echocardiography
- Transthoracic echocardiography

In addition, the applicant organization will:

- Have a *designated* neuro-intensive care unit (ICU)/*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 *INSTOR, GWTG, State required program etc. (For non- American hospitals, an equivalent data capture process will be identified)*
- Participate in IRB stroke research.

## **Survey Process**

### **Before the Survey**

*Organizations that are in the process of becoming an applicant organization will receive support from the DNV GL stroke program staff. The sales team acts as an account manager right in the beginning of the process, giving information about DNV GL, 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 GL stroke program staff know that your success in meeting the guidelines 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 eligibility by the stroke program manager. Once eligibility had been determined, the application will be processed, a contract will be developed and sent to the applicant.*

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

*The assigned lead surveyor for the 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 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 room*
- imaging locations*
- interventional/surgical suites*
- ICU, designated inpatient units*
- rehabilitation areas and*
- other patient care settings, as appropriate to the level of services provided.*

*The surveyors will review:*

- policies*
- protocols*
- transfer agreements*
- telemedicine capability and documentation*
- clinical records*
- personnel files and training records,*
- credentialing files and*
- 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. You will be expected to write a corrective action plan for each finding and submit to DNV GL within ten calendar days. The corrective action plan (CAP) will be reviewed to determine if the CAP addresses each finding until the full report is complete and accepted. If there are questions or clarifications needed during the review process, a technical review team member will contact your organization for clarification.*

*(For non-American hospitals, there may be some changes in the time allotted as to when reports and corrective actions are due.)*

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*

*For level 1 non-conformities, you will need to send specific requested data within 90 days to validate that the corrective action is in place and that it was effective in addressing the non-conformities.*

***For initial surveys, DNV GL 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 those components only that would be thought to need in person validation 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 Alteplase, post thrombectomies or other surgical 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.*
- Lack of designated medical director or nurse stroke coordinator*
- 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 nurse stroke coordinator*

## Abbreviations and Definitions

AANN	American Association of Neuroscience Nurses
ABNN	American Board of Neuroscience Nursing
Acute care phase	includes critical care units, intermediate care units, stroke units, and general medical units
AHA	American Heart Association
AIS	Acute Ischemic Stroke
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
<i>AF or Afib</i>	<i>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.</i>
Alteplase	tissue plasminogen activator tPA (thrombolytic medication)
AMA	American Medical Association
AVM	Arteriovenous malformation
BAC	Brain Attack Coalition
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
CR	Certification Requirement.
CSC	Comprehensive Stroke Center
CSRN	Certified Stroke Registered Nurse
<i>CTA</i>	<i>Computed Tomography Angiography</i>
<i>CTP</i>	<i>Computed Tomography Perfusion</i>
DEA	Drug Enforcement Administration
EMS	Emergency Medical Services
FDA	Food and Drug Administration

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GCS	Glasgow Coma Scale score
HHA	Home Health Agency
IAT	Rapid local delivery of thrombolytic agent through a micro catheter placed near the site of occlusion
ICH	Intracerebral hemorrhage
ISMP	Institute for Safe Medication Practices
ISO	International Organization of Standardization
LSC	Life Safety Code® National Fire Protection Association
MRA	Magnetic Resonance Angiography
mRs	Modified Rankin Scale
NIHSS	National Institutes of Health Stroke Scale
NFPA	National Fire Protection Association
PSC	Primary Stroke Center
PWI	Perfusion weighted imaging
QMS	Quality Management System
SAH	Subarachnoid hemorrhage
SCRN	Stroke Certified Registered Nurse
Tele-stroke/ Tele-medicine	an approach to treating vascular disease that allows a neurologist to provide remote treatment for a stroke victim. Electronic communications may include telephone, internet or video conferencing, providing consultation and diagnostic services.
<i>Tenecteplase</i>	<i>tissue plasminogen activator</i> <i>Tnkase (thrombolytic medication)</i>
TIA	Transient Ischemic Attack
Troponin	Complex of three regulatory proteins ( <b>troponin C</b> , <b>troponin I</b> , and <b>troponin T</b> ) that is integral to muscle contraction in skeletal muscle and cardiac muscle. Often elevated after stroke.

## Program Management (PM)

The CSC shall establish, document, implement and maintain the CSC 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 CSC is in compliance with all applicable Federal and State laws regarding the health and safety of its patients;

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

CR.1c *Hiring, Appointments and privileging* criteria include aspects of individual character, competence, training, experience and judgment is established for the selection of individuals working for the CSC, directly or under contract; and,

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

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

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 CSC.

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

CR.2 The medical director for the CSC must have significant amount of training and expertise knowledge and be a neurologist, neurosurgeon or other medical professional.

Qualifications for the CSC Director shall include greater than or equal to 2 of the following:

CR.2a Board-certified neurologist, neurosurgeon or Interventional Neuro-radiologist that has completed a stroke fellowship, Interventional Neuroradiology fellowship or vascular neurosurgery fellowship or has equivalent experience

CR.2b Completion of a vascular neurology fellowship or board certified in vascular neurology,

CR.2c A clinician who diagnoses and treats greater than or equal to 50 patients with cerebrovascular disease, annually,

CR.2d A clinician with greater than or equal to 5-10 peer-reviewed publications dealing with cerebrovascular disease;

CR.2e A clinician with greater than or equal to 8 continuing medical education (CME) credits each year in areas directly related to cerebrovascular disease and

CR.2f 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 (24/7) 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. If there is a co-program director identified, there shall be a written delineation of scope, coverage, 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 CSC Program and continually improving its effectiveness by:

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

CR.2 Establishing the CSC Program and ensuring that objectives are established,

CR.3 Conducting Program reviews and ensuring the availability of resources.

## **PM.3 Program Leadership**

The CSC program leadership shall:

CR.1 Determine the processes needed for the CSC Program and their application throughout the CSC,

CR.2 Determine criteria and methods needed to ensure that both the operation and control of these processes is effective,

CR.3 Ensure the availability of resources and information necessary to support the operation and monitoring of these processes,

CR.4 Monitor, measure where applicable, and analyze these processes, and

CR.5 Implement actions necessary to achieve planned results and continual improvement of these processes.

## 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 Comprehensive Stroke Center), medical staff, and administrative officials are responsible and accountable for ensuring that the Comprehensive Stroke Center (CSC) implements and maintains an effective quality management system. The host hospital will assure that adequate resources are allocated for measuring, assessing, improving, and sustaining the CSCs performance and reducing risk to patients.

CR.1 The CSC must be involved in and implement the host hospitals method for maintaining an ongoing system for managing quality and patient safety.

CR.2 The CSC 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 CSC has established programmatic measurable quality objectives and the results are analyzed addressed; and

CR.4 Appropriate information from the CSC has been submitted to the host hospital oversight group for quality management, as directed.

### QM.2 Quality Outline/Plan

The CSC 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 CSC Program quality objectives, including those needed to meet requirements for the CSC Program are established. The quality objectives shall be measurable and consistent with the requirements of the CSC 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 CSC program are implemented and maintained. *(This may be the stroke coordinator in some facilities.)*

## QM.5 Program Review

CR.1 Variations, deficiencies or non-conformities identified by the CSC shall be addressed by the stroke committee *with members defined by the stroke program management.*

*CR.1a Variations or non-conformities identified in CSC certification survey reports shall be addressed by the stroke committee.*

*CR.1b Corrective actions* will be determined, applied, and *reviewed for improvement.*

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 CSC program components and metrics.

**Note:** Documentation of activities may take the form of a Failure, Mode and Effect Analysis, Root Cause Analysis, Performance Report, Non-Conformity Report, specific Improvement Project analysis, etc.

## QM.6 System Requirements

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

CR.1 An Interdisciplinary group to oversee the CSC specific quality data that *must* include *at least* the medical director of the CSC, the nurse stroke coordinator (and/or nurse practitioner or physician's assistant) and a quality facilitator. *This will be considered the Core Stroke Team.* Other discipline representatives and practitioner members *that are included* are at the discretion of the CSC. This interdisciplinary group shall conduct quality and programmatic reviews;

CR.2 There shall be a written document defining the quality oversight process, to include all components of the CSC clinical and non-clinical services, as needed.

CR.3 Measurable Quality Objectives; and,

CR.4 Goal Measurement / Prioritization of activities based in some manner to:

CR.4a problem-prone areas, processes or functions,

CR.4b consider the incidence, prevalence and severity of problems in these areas, processes or functions,

CR.4c and effect on health outcomes; improve patient safety and quality of care.

## **QM.7 Measurement, Monitoring, Analysis**

The CSC 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 CSC should encompass overall patient outcomes, linkages among key components of the CSC, *as well as* potential problems that *may* impede the care provided under the CSC.

Measurement, monitoring and analysis of processes of the CSC 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 CSC *leadership shall be responsible for the development of performance measures and strategies for measuring, refining and reassessing. CSC leadership shall* define the frequency and detail of the measurement *for, at a minimum, the following key system components:*

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

**Note:** This data will capture stroke team response time to acute stroke patients, treatments used and patient disposition. It is the discretion of the CSC 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 Hyper acute stroke treatment shall have 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 physician  $\leq 10$  minutes

CR.2b Door to stroke team  $\leq 15$  minutes

CR.2c Door to CT/MRI initiation  $\leq 20$  minutes

CR.2d Door to CT interpretation  $\leq 45$  minutes

CR.2e Order to lab results  $\leq 45$  minutes, if ordered

CR.2f Connected contact (computer linkage, phone, or whatever form the organization utilizes) to telemedicine consultant from the time when

determined medically necessary by ED physician ≤20 minutes

CR.2g Door to IV Alteplase bolus (≥75% compliance) ≤60 minutes

**AND**

Door to IV Alteplase bolus (≥50% compliance) ≤45 minutes

CR.2h Transfer of patients to CSC ≤2 hours of sending ED arrival (or when medically stable)

CR.2i Door to monitored bed admission ≤3 hours

**Note:** Achieving Door to Needle times (time of bolus administration) within 60 minutes in 75% or more of acute ischemic stroke patients treated with IV Alteplase

**AND**

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

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 room as the monitored bed requirement, adequate staffing with demonstrated competence to physiologically monitor the patient must also be provided.*

CR.3 *There shall be secondary prevention measures of patient outcomes and avoidance of complications and recurrent strokes.*

#	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 (mortality, functional status, and community discharge) and the percentage of stroke patients who receive the appropriate level of rehabilitation services in the system. (Only applicable to patients who are admitted)

*4a Pre-Morbid Modified Rankin Score by or at discharge*

*4b Modified Rankin Score at discharge*

*4c Modified Rankin Score 90 days after discharge (See Addendum B)*

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.

- CR.6 The CSC shall monitor perioperative complication rates and overall outcomes for comparison with national benchmarks after correcting for various comorbidities.
- CR.7 The perioperative mortality rate for aneurysm clipping, coiling and other surgical or interventional procedures should be documented, reviewed, and compared with published outcomes. A formal M&M process shall review all cases that meet defined quality indicators.
- CR.7a Records of the results of the M&M review and actions arising from the review shall be documented and maintained.

## **QM.8 Patient Safety System**

- CR.1 The CSC shall follow and participate in the host hospitals program for establishing clear expectations for identifying and detecting the prevalence and severity of incidents that impact or threaten patient safety.

**Note:** 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*.

## **QM.9 DNV GL Healthcare Comprehensive Stroke Center Metrics For Measuring Processes And Quality**

See Addendum [A and B](#)

## **Patient Care Services (PC)**

### **PC.1 Planning For Service Delivery**

The CSC *team, with other disciplines*, shall plan and develop the processes needed for CSC service delivery. Planning of the CSC service delivery shall be consistent with the certification requirements of the processes of the CSC Program. In planning CSC services delivery, the CSC shall determine the following, as appropriate:

- CR.1 Quality objectives and requirements for the CSC;
- CR.2 The need to establish processes and documents, and to provide resources specific to the CSC;

- CR.3 Required verification, validation, monitoring, and measurement, specific to the CSC,
- CR.4 Records needed to provide evidence that the processes meet requirements. The output of this planning shall be in a form suitable for the CSC's method of operations.

## **PC.2 Review of Eligibility and Ongoing Requirements Related to CSC Service Delivery**

The CSC *core team, with other* disciplines, shall review the requirements related to the CSC Program. This review shall be conducted prior to the CSC's commitment to provide services to patients and shall ensure that

- CR.1 CSC Program requirements are defined,
- CR.2 The CSC has the ability to meet the defined requirements.
- CR.3 *Records of the results of review and actions shall be maintained.*
- CR.4 When the CSC Program requirements are changed, the CSC shall ensure that relevant documents are amended and that relevant personnel are made aware of the changed requirements.
- CR.5 The CSC shall care for greater than or equal to 20 SAH patients *over the last 24 months from the time of application.*
- CR.6 The CSC shall accomplish greater than or equal to 10 clippings and/or coiling's (combined) per year for aneurysm treatment.
- CR.7 The CSC shall have performed 25 thrombectomies over last 24 months from the time of application.*
- CR.8 The CSC shall have administered IV Alteplase to an average of 25 eligible patients over the last 24 months from time of application. The following two conditions may be applied to the eligible patient numbers in addition to the administration of Alteplase at the CSC site.*

**Note:** IV Alteplase that was 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 Alteplase administrations.

**OR**

If the patient is not transferred to the CSC, *but* there is evidence of follow up monitoring, can be counted in the eligibility number (These cases must be added to the programs indicators tracking to be included in the eligibility numbers.).

CR.9 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.*

### **PC.3 Control of Service Delivery**

The CSC shall plan and carry out services under controlled conditions. Controlled conditions shall include, as applicable:

CR.1 The availability of information that describes the characteristics of the CSC Program,

CR.2 The availability of policies, procedures, protocols, as necessary,

CR.3 The availability, use, and monitoring of suitable equipment.

### **PC.4 Emergency Department**

CR.1 The CSC is responsible for developing and maintaining efficient 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 *Alteplase*
- Tenecteplase, if administered*
- Reversal of coagulopathies
- Control and reduction of elevated intracranial pressure
- Control of seizures
- Blood pressure 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 Times of all assessments,

CR.4c The patient has been screened for dysphagia before receiving any oral medications, food or fluids,

CR.4d The patient has been tested for blood glucose levels before Alteplase eligibility is determined,

CR.4e The emergent ischemic patient has been assessed with the NIHSS by a qualified member of the AST,

CR.4f Intravenous Alteplase for eligible patients within 3-4.5 hours of onset of ischemic stroke.

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:

Alteplase Monitoring Requirements	Pre-Bolus	During Infusion	Post Infusion
Neurological assessment	No more than 15 minutes before bolus	every 15 minutes during the one hour infusion	Every 15 minutes for the first hour after infusion
			Every 30 minutes for next 6 hours
			Hourly from eighth post infusion hour until 24 hours after infusion
Vital Signs	No more than 15 minutes before bolus	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
			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 are assessed for endovascular treatment options *whether* receiving Alteplase or if they are not a candidate for Alteplase. *Documentation must be present as to the decision by the treating physician.*

CR.6 There are specified timeframes related to the assessment and initial treatment that have been addressed with the stroke protocols, as applicable to the emergency department. [\(See QM.7 CR.2\)](#)

- CR.7 Maintain a current and complete call schedule with contact information of the physicians on staff and/or available for the CSC.
- CR.8 The Emergency department will maintain a log that includes:
- CR.8a A log documenting call times, response times, patient diagnoses, treatments, outcomes and dispositions will be kept and used for quality data review.
  - CR.8b Door to needle-time for administration of intravenous tissue plasminogen activator (Alteplase) to eligible ischemic stroke patients shall have as its goal a time of  $\leq 60$  minutes (Target:  $\leq 45$  minutes). Documentation of these results shall be maintained in a log, database or registry and reviewed by the stroke team regularly.
  - CR.8c CSCs must keep a log of times it notifies EMS that it is unable to provide services for stroke patients in accordance with local policies and procedures.
  - CR.8d CSCs must keep a log of times that it is notified that referral CSCs were not able to provide coverage Neurosurgical and/or Endovascular services.

## **PC.5 Emergency Medical Services**

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

- CR.1 A document of cooperation between the CSC 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 (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, Los Angeles Pre-hospital Stroke Screen or other accepted tool.
- CR.2e The program and EMS determine circumstances and alternate protocols in which the CSC 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.

*NOTE: Training could address:*

- Reliable identification of stroke patients using a standardized assessment tool.*
- Conditions that mimic acute stroke symptoms, such as patients presenting with:*
  - a) Hypoglycemia*
  - b) Alcohol and drug intoxication,*
  - c) Postictal hemiparesis*
  - d) Other non-stroke causes of acute neurological deficits*

**Note:** EMS providers should be able to provide early pre- notification to receiving hospitals when a stroke is recognized in the field. This action may reduce door to needle time and increase the numbers of eligible patients to be treated.

## **PC.6 Telemedicine/Telestroke**

CR.1 The organization must have a written description of the type *and usage* of telemedicine technologies available on site at the CSC, *if utilized*.

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

CR.2 There will be a description of the technical requirements (such as speed and resolution) of equipment both at the sending and receiving site.

CR.3 The medical professionals providing remote medical guidance will have evidence of training and expertise that is required.

CR.4 The tele stroke *or neuro consultant* should be *available within* 20 minutes of when it is considered necessary by the *emergency* physician, in order to meet the less than or equal to 60-minute door to needle time

**Note:** In other less urgent cases, the time frame may be defined to a longer time.

## PC.7 Acute Stroke Team (AST)

CR.1 The organization must have a designated interdisciplinary Stroke team. *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 room and/or in house stroke alerts.*

*The other part of the stroke team organization is the task force that works together daily to facilitate the adherence to stroke 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 physical requirements, and performance expectations for their role on the stroke team.

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

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

CR.1b The CSC shall define the criteria and qualifications (through plan, policy or procedure) required for designation of qualified practitioners, professionals and other personnel assigned to the Acute Stroke Team (AST).

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 performing carotid endarterectomies (CEA),
- Physician with expertise in cerebrovascular disease;
- Emergency department personnel and emergency medical services,
- 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*
- Case manager or social worker, *as indicated*
- Other qualified professional with expertise defined by the medical staff and CSC team, *as indicated*

CR.2 The acute stroke team is available and on call 24/7.

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:** AST may be a separate team or the rapid response team in the 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 Stroke Team 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.

CR.3a The CSC *core team members are required to have 8* hours of education, initially *in orientation* and *then* annually.

**Note:** The CSC 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 CSC to exclude any personnel, with justification, when they are not specifically dedicated to the CSC ([See SM.2 for detailed requirements](#)).

CR.4 The CSC shall include an Advanced Practice Nurse as part of the CSC team.

**Note:** APN designation could include a nurse practitioner; a master's prepared clinical nurse specialist, or American Board of Neuroscience Nurses-certified nurse.

## **PC.8 Protocols**

CR.1 The CSC 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 the emergent care of a stroke patient and ongoing care including but not limited to:*

CR.1a TIA

CR.1b Ischemic stroke

CR.1c Hemorrhagic stroke

CR.1d Telemedicine/Tele-stroke consultation

CR.1e Alteplase *and/or Tenecteplase* therapy administration and post monitoring

CR.1f Dysphagia screening (evidence based tool)

CR.1g Blood pressure and oxygenation management

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

CR.1i In-house stroke alert

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

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

**Note:** Protocols and or pathways used to rapidly identify and evaluate potential stroke patients shall be available in the ED, acute care areas and stroke designated beds/units and reviewed and updated, as needed, at least annually.

CR.2 The response process shall include an early implementation of stroke pathway (protocol) and one call notification to the 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 function check parameters

CR.3b Blood pressure management parameters

CR.3c Blood glucose control

CR.3d Parameters to treat fever

CR.3e Oxygenation management parameters

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

CR.3g Brain imaging

CR.3h Inclusion and exclusion criteria

**Note:** AHA guidelines for emergency cardiovascular care for stroke patients recommend administration of oxygen to hypoxic patients to maintain oxygen saturation >94%.

**Note:** AHA guidelines for specific blood pressure management recommendations have been established for acute ischemic stroke patients being considered for fibrinolytic therapy.

These recommendations include bringing the blood pressure below 185/110 mm Hg to qualify for fibrinolytic therapy with intravenous Alteplase. Once intravenous Alteplase is given, blood pressure must be maintained below 180/105 mm Hg to limit the risk of ICH.

**Note:** Recent AHA guidelines for Hypoglycemia (blood glucose <60 mg/dL) should be treated in patients with acute ischemic stroke.

These recommendations indicate that persistent in-hospital hyperglycemia during the first 24 hours after stroke is associated with worse outcomes than normoglycemia, and thus, it is reasonable to treat hyperglycemia to achieve blood glucose levels in a range of 140 to 180 mg/dL and to closely monitor to prevent hypoglycemia in patients with acute ischemic stroke

CR.4 If the CSC does not transfer patients for neurosurgical emergencies, the CSC 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 by the patient.

CR.5 If the CSC does transfer patients for neurosurgical emergencies, there is a written protocol for rapid transfer.

CR.5a There is documentation for any event in which neurosurgical services were not available within 90 minutes of identified need from the collaborating CSC stroke center.

## **PC.9 Transfer Agreement**

The CSC has evidence to support that coverage for neurosurgical services is in place or arrangements (transfer agreements) have been made with another facility when providing these services.

CR.1 The CSC has a written transfer agreement (or understanding) with each PSC or ASR that the CSC provides services.

The transfer agreement will include:

CR.1a Contact names and phone numbers,

CR.1b Hours of operation,

CR.1c Transportation options (ground, air),

CR.1d Address 24/7 basis,

CR.1e Bypass or diversion plan for additional receiving hospital,

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

CR.2 There is a written document/ transfer agreement with a transportation vendor that cover both ground ambulance and air ambulance transfer options.

CR.3 There shall be a transfer agreement with another CSC, in the event that a CSC cannot provide services within two hours.

### **PC.10 Plan of Care**

CR.1 Nursing staff shall develop a standardized plan of care for the emergent acute stroke patient which will include identified individual needs for the patient based on their condition and the family's needs. Documentation of these interdisciplinary findings shall be included in the plan of care, as appropriate. (See CR.2 for consideration of inclusion of appropriate items for *acute stroke patients*)

CR.2. Nursing staff shall establish an initial plan of care immediately upon admission. Nursing staff will complete and maintain a plan of care prepared by qualified individuals for each patient within 24 hours of admission 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 appropriate

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

CR.2b (1) Temperature monitoring and management

CR.2b (2) Blood pressure evaluation and management

CR.2b (3) Neuros (*defined as to what is being used*) and NIHSS status

*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*

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

CR.2e Oxygenation

*CR. 2e (1) O2 goal at or above 94%*

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

*CR.2f (1) patients may not be able to clear secretions and could be at high risk for aspiration.*

CR.2g Fluid intake/Fluid management

CR.2g (1) Fluid management is crucial for the patient with acute stroke; both volume overload and depletion should be avoided

CR.2h Patient/family education *individual risk factors as well as general risk factors*

CR.2i *Potential complications specific to treatment:*

- Bleeding with Alteplase, Tenecteplase or invasive interventional procedures*
- Angioedema*
- Assess IV/arterial puncture sites, urine, gums, skin, emesis, etc. for bleeding*
- Monitor extremities for color, temperature and sensation.*

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*

- 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 and in 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 in many forms such as included in established interdisciplinary protocols, a separate document or standardized format within nursing/admission notes.

**PC.11 Medication Management**

- CR.1 The CSC shall have 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 Federal and State 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 CSC (through the medical staff or pharmaceutical oversight group) shall select a list of medications to be available for the CSC. The list shall be available to all appropriate staff at all times.
  - CR.4a Medications available to the CSC (identified within the formulary) will include IV thrombolytic therapy medications for treatment of ischemic stroke.
  - CR.4b *The CSC (through the pharmacy oversight) has 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 will have access to appropriately qualified personnel for consultation regarding the use of IV thrombolytic therapy, when obtained from a physician competent and privileged in the diagnosis and treatment of ischemic stroke.

*NOTE: If the emergency departments licensed independent practitioners are privileged in the diagnosis and treatment of ischemic stroke, then access to bedside or telemedicine consultation is not necessary.*
- CR.6 Emergency department practitioners can demonstrate safe and effective use of Alteplase:
  - CR.6a Safe time frames for administration of Alteplase



*For the purpose of a definition as to safe and effective timeframe for the administration of Alteplase, the definition that will now be used, based on a review of the literature, is that 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.*

CR.6b Exclusion /contraindication criteria

CR.6c Dosage and mixing instructions

- Following manufacturer guidelines*
- Physician order for normal saline flush to be run at the same rate as dose of Alteplase*
- Excess Alteplase discarded before the start of the infusion*
- Allow for the remainder of the medication that is left in the tubing*
- Infusion and flush must be completed within 60 minutes (or less) to complete the original dose*

CR.6d Monitoring protocols for identification of post Alteplase neurological deterioration ([See PC.4 CR.4g](#))

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

- *EMS will verify with sending hospital that excess Activase has been withdrawn from the bottle and wasted. This ensures the bottle will be empty when the full dose is finished.*

**Example Only:** *if the total dose is 70 mg, then 30 cc should be withdrawn and wasted since a 100-mg bottle of Activase contains 100 mL of fluid when reconstituted.*

- *Sending hospital should apply a label to Activase bottle with the number of mL of fluid that should be in the bottle in case of pump failure during transit.*

**Note:** Dosing charts and standardized order sets can facilitate timely administration and minimize dosing errors.

**Note:** If the patient's weight is not known and cannot be quickly ascertained from self-report or by other means such as prior records, two healthcare workers should independently estimate the patient's weight and the resulting average estimate should be used as the approximate weight for drug administration.

## PC.12 Diagnostic Tests

CR.1 Laboratory 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 CSC policy.

**NOTE:** *Baseline troponin assessment is recommended in patients presenting with AIS, but should not delay initiation of IV Alteplase.*

**Note:** Glucose testing performed by EMS prior to arrival may be accepted, according with the policy of the CSC 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, so 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 Alteplase within 45 minutes.

CR.2c The brain imaging study should be interpreted by a physician with expertise *and privileged* in reading CT or MRI Studies.

CR.2d A diffusion-weighted MRI shall be completed within 2 hours of the test being ordered if for emergent patients. These services shall be made available *when needed*.

CR.2e MR angiography (MRA) shall be completed within 2 hours of the test being ordered, for emergent. These services shall be made available 24/7.

CR.2f Catheter Angiography (CA) shall be started within 120 minutes of being ordered (goal), *if emergent*.

CR.2g Extracranial Ultrasonography (U/S) shall be available and adhere to proficiency guidelines by the Intersocietal Committee for the Accreditation of Vascular Laboratories (ICAVL) or a similar credentialing organization.

CR.2h Transcranial Doppler (TCD) shall be available and adhere to proficiency guidelines by the Intersocietal Committee for the Accreditation of Vascular Laboratories (ICAVL) or a similar credentialing organization.

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

CR.2j Cerebral Blood Flow test may be useful for guiding acute therapy but are not required on an emergent basis.

CR.3 The physician's evaluation, diagnostic testing including neuroimaging and contact with a physician with stroke expertise should be performed concurrently.

CR.3a Concurrent conditions shall be communicated to the consulting physician as well as the stroke assessment findings.

**Note:** *For patients who otherwise meet criteria for endovascular treatment, a noninvasive intracranial vascular study is recommended during the initial imaging evaluation of the acute stroke but should not delay IV Alteplase if indicated.*

*For patients who qualify for IV Alteplase, initiating IV Alteplase before non-invasive vascular imaging is recommended for patients who have not had it as part of their initial imaging assessment. Non-invasive intracranial vascular imaging should then be obtained as quickly as possible.*

### **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 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, and

CR.2f Enhance quality of life.

- CR.3 Rehabilitation Services, as defined by the medical staff and CSC, and consistent with State and Federal law, shall be performed by competent physical therapists, physical therapy assistants, occupational therapists, occupational therapy assistants, speech-language pathologists, or audiologists. Staff shall have experience in the treatment of stroke patients.
- CR.4 Rehabilitation Services should be directed by properly trained individuals (i.e. neurologist experienced in stroke rehabilitation or other physicians or PhDs with fellowship training in rehabilitation).
- CR.5 Therapists, social workers, and nurse case managers must meet requirements for state licensure and *preferably* have at least one year of experience in the treatment of stroke survivors.
- CR.6 The CSC shall require physical, occupational and speech therapists to be readily available by consultation for patient assessment and therapy during the patient hospitalization. Consults and assessments will be performed and documented within 24 hours of admission or when feasible once the patient is medically stable.
- CR.6a Documentation in the medical record of attempts to perform a patient assessment and reason why it was not able to be performed is required.
- CR.6b If the CSC 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.
- CR.7 The nurse care managers and social workers must have an adequate knowledge of inpatient rehabilitation facilities and community resources in their geographic regions.
- CR.7a Nurse case managers and Social workers must have a demonstrated expertise regarding neurology/stroke care, care coordination, levels of rehabilitation and community resources in their geographic regions.
- CR.8 The organization shall have a written treatment plan in accordance with orders from practitioner's 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.
- CR.9 The treatment plan and the personnel qualifications must be in accordance with national acceptable standards of practice.

#### **PC.14 Patient/Family/Community Education**

- CR.1 The CSC Program 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:
- Risk factors, signs, symptoms for stroke or other cardiovascular diseases
  - General prevention efforts that target smoking cessation, obesity, and diabetes,
  - Management of hypertension, lipid levels, atrial fibrillation, and medication adherence,
  - Other issues as identified by the CSC.
- CR.4 The CSC 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 existing 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 If available and/or required by the medical staff to hold or maintain clinical privileges, include a review of individual performance data variation from criteria determined by the medical staff to identify need for training or proctoring that may be required.*

## **MS.2 Program Medical Director**

- CR.1 The medical director for the CSC must have significant amount of training and expertise/knowledge as delineated in PM.1 CR.2.*
- CR.2 The director or designee shall be available 24 hours per day, 7 days per week (24/7) to provide leadership and deal with difficult medical, logistical, and administrative issues*
- CR. 3 The director shall be involved in the assessment of patients and provide consultative advice to other treating physicians.*
- CR.4 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 CSC.

- CR.1 The CSC 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 CSC 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 CSC 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 CSC as required.

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

**Note:** May be in person or by telemedicine.

CR.4 The CSC 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*.

## **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 room department.

CR.3 *If the CSC 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 If the CSC does not transfer patients for neurosurgical emergencies, the CSC 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 greater than or equal to 10 surgical intervention cases per year.

**Note:** Examples: at least ten clippings/coiling's on site per neurosurgeon

- When there are less cases for each practitioner than ten, the organization may;*
- receive data from another hospital where the practitioner has performed more clippings.*
  - If this is not possible, other types cases reviewed could also include but not be limited to CEAs, craniotomies, EVD placement, etc.*

## **MS.6 ICU /Critical Care Management and Coverage**

- CR.1 The CSC 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 should have the following:
- CR.1a Board-certified or board eligible neurologist, neurosurgeon, 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 Attend greater than or equal to 8 hours per year of CME activities (or similar educational programs) related to or focused on cerebrovascular disease.
- CR.2 Intensivists that meet criteria set by the medical staff, may staff the ICU that contains the dedicated neuro beds under the condition that there is a neurologist on call for consultation 24/7 and can be in house within 45 minutes.
- CR.2a Criteria set by medical staff shall be in writing.
  - CR.2b There shall be documentation of review of individual intensivist 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 coiling's
  - CR.1b Intracranial/extra cranial angioplasty  
*(Stents, Balloons, Retrievers, liquid embolic agent)*
  - 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 in patient and out patient*
- Radiology department*
- Emergency department*
- Special procedure areas (Interventional Radiology (IR); endoscopy, pain management clinics, etc.)*

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

*CR.1a A qualified anesthesiologist or a doctor of medicine or osteopathy (other than an anesthesiologist);*

*CR.1b The hospital's medical staff will define the criteria and qualifications for those physicians who have privileges for administering anesthesia/sedation in accordance with State laws and acceptable standards of practice.*

*CR.2 The Medical Staff, together with Anesthesia services will determine appropriate qualifications for a Licensed Practitioner, 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.*

**Note:** *The host hospital may define what those criteria are but these should include, at a minimum, current ACLS / ATLS etc. certification and documented proficiency in airway management.*

*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 intended was. All personnel assisting in a procedure carried out under moderate sedation or higher must have current documented proficiency commensurate with their role.*

*Note: RNs will have documented, current ACLS or similar certification;  
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 CSC will follow the host hospital's criteria as well as Federal and State Laws and requirements and acceptable standards of care with regards to pre-anesthesia screening and assessment and post anesthesia follow-up.*

## **Nursing Services (NS)**

### **NS.1 Nursing Service**

- CR.1 The CSC 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 CSC.
- CR.2 There shall be 24-hour nursing services and a registered nurse must supervise and evaluate the nursing care for each CSC 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:** May be in form of addendum to job description or in program specific competencies.

CR.2b CSC nurses required training will include but not be limited to:

- 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 receiving Alteplase and post thrombolytic therapy,
- CR.2b (5) Treatment of blood pressure abnormalities with parenteral vasoactive agents,
- CR.2b (6) Management of intubated/ventilated patients, and
- 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 CSC staff and the host hospital.

CR.2c CSC nurses (as defined by the organization) should:

- CR.2c (1) Be certified in NIHSS or equivalent standard neurologic assessments and scales,
- CR.2c (2) Have a working knowledge of the organizations stroke protocols, and/or care maps,
- CR.2c (3) Be familiar and involved in ongoing research projects, and
- CR.2c (4) Be aware of new patient care techniques related to stroke.

CR.2d Nursing staff not assigned to the CSC, 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 CSC as needed. A registered nurse must be immediately available for the bedside care of every patient, as required by State law.

CR.3a The nursing: 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.5 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.6 Non-employee licensed nurses who are working in the CSC must adhere to the policies and procedures of the CSC. The director of the CSC 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.7 Each CSC 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 affecting conformity to the CSC Program requirements shall be competent based on appropriate education, training, skills and experience.

CR.1 The CSC 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 CSC and Federal and State law.

**SM.2 Competence, Training and Awareness**

The CSC shall:

- CR1. Determine the necessary competencies for personnel performing work affecting conformity to CSC Program requirements,
- CR.2 Have documented evidence to demonstrate initial *orientation* and ongoing training in the care of acute stroke patients for individuals assigned to the CSC 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 assigned to the CSC, as determined appropriate by the CSC and as appropriate to the care practitioners' level of responsibility related specifically to CSC services. *See Education and Training Table.*

<i>Education and Training Table (CR.4)</i>		
<i>Position</i>	<i>Annual Hours</i>	<i>Notes</i>
<b>Stroke Core Team</b> <i>Stroke Medical Director</i> <i>Nurse Stroke Coordinator</i> <i>Stroke Quality Representative</i> <i>Stroke Advanced Practice Nurse</i> <i>Or</i> <i>Physician's Assistant</i>	8 education hours	<i>Others as identified by CSC Leadership</i>  <i>May include:</i> <i>Nurse Practitioner, ABNN-certified nurse;</i> <i>Masters prepared clinical nurse specialist</i> <i>OR</i> <i>Physician's Assistant</i>
<i>Acute Stroke Team (AST)/Response Team</i>	8 hours	<i>If rapid response team answers in house strokes, at least one member of the rapid response team shall meet AST education criteria.</i>
<i>Emergency Department Medical Director</i> <i>Interventional Radiologists</i> <i>Neuro-Intensivists</i> <i>Neurologists</i> <i>Neuro-surgeons</i>	8 education hours	<i>NOTE: any practitioner that is not specified in this grid and works with the stroke patients need to be included in this category</i>
<i>Hospitalists</i> <i>Intensivists</i>	<i>Determined by medical staff</i>	<i>This depends on scope of service. Medical staff might require neuro specific training such as ENLS.</i>

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<i>ICU Nurse Manager Emergency Department Nurse Manager</i>	<i>8 education hours</i>	<i>If clinical supervision is assigned to nurse educator rather than nurse managers, then they must meet the educational requirement</i>
<i>Emergency Department Physicians</i>	<i>4 education hours</i>	
<i>Emergency Department RNs Rehabilitation Therapists</i>	<i>4 education hours</i>	
<i>Neuro-Dedicated Unit-ICU RNs  Interventionalist nurses  Stroke Unit (Step Down)  Mixed Population ICU RNs</i>	<i>8 education hours</i>	<i>All nurses that work in these settings with stroke patients</i>
<i>Nurses not assigned to stroke units such as Med Surg, Obstetrics, etc.</i>	<i>One education hours</i>	<i>Should include but not be limited to: Recognition of stroke Policy and process for in house stroke alert</i>
<i>All other staff</i>	<i>1 stroke awareness/ recognition activity</i>	<i>FAST training could be an option and would be acceptable</i>

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

**SM.3 Determining and Modifying Staffing**

CR.1 The method for determining and modifying staffing shall be validated through periodic reporting of variance from core staffing, outlining justification and linking that justification with patient and process outcomes, including any untoward patient events or process failures.

## **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:** CSC specific requirements may be in an addendum to the job description 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 Federal and State law, the host hospital, regulation and the CSC. The CSC 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, the host hospital policies and any additional *stroke* program specific competencies.

CR.2 The staff shall be evaluated initially and on an on-going basis against indicators that measure issues and opportunities for improvement that are identified by variations and problem processes identified through the analysis of structures processes and outcomes measurement as required by the CSC.

CR.3 The CSC 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 CSC shall protect and promote each patient's rights as required by the host hospital policies. The CSC 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 his/her plan of care;

- CR.2 Information to the patient or family of patient care 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 CSC must allow the patient to formulate advance directives and to have CSC staff and practitioners comply with the advance directives in accordance with the host hospital policies as well as Federal and State law, rules and regulations.

- CR.1 The CSC shall document in the patient's medical record whether or not the patient has executed an advance directive.
- CR.2 The CSC shall not condition the provision of care or otherwise discriminate based on the execution of the advance directive.
- CR.3 The CSC, through the host hospital, shall ensure compliance with State law regarding the provision of an advance directive.
- CR.4 The CSC, through the host hospital, shall provide education for staff regarding the advance directive.
- CR.5 When it is determined that an advance directive exists and is not in the patient's medical record, the CSC will follow the host hospitals written policy for follow-up and compliance with the policy.

### **PR.3 Language and Communication**

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

- CR.1 The CSC, 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**

The CSC shall obtain an informed consent from each patient or authorized representative for the provision of medical care under the CSC. The consent shall include an explanation of risks, benefits, and alternatives for procedures, diagnostic tests, and participation in activities related to the CSC, as defined by the medical staff and State law.

- CR.1 IV Alteplase is recognized as the standard of care and is approved by the FDA for qualified individuals who present within 3 hours of ischemic stroke onset. If the patient has decision-making capacity or a proxy decision maker is present, a physician shall document the discussion regarding risks, benefits, and alternatives to IV Alteplase which shall take place prior to the administration of the medication. Unless required by local practices, a signed informed consent document is not a prerequisite to the administration of IV Alteplase in these circumstances.
- CR.2 If the patient lacks capacity and no proxy decision maker 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 and other members of the health care team should document the patient's absence of decision-making capacity, that attempts to contact a proxy decision maker were unsuccessful, and that there is an urgent medical need to proceed with treatment in the absence of consent.
- CR.3 When the duration of stroke symptoms exceeds the duration indicated by standard of care for IV Alteplase administration, the principle of implied consent for emergency treatment is not applicable, and physicians should obtain informed consent. Local practices will determine whether a signed informed consent document is necessary in these cases.

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

**Note:** Regulatory precedents set by FDA and the Department of Health and Human Services in the United States and by the World Medical Association internationally support the use of intravenous Alteplase in patients lacking capacity when an alternative form of consent cannot be obtained within the treatment window.

- CR.4 Informed consent for IA/catheter therapy, thrombectomy, CEA or any other surgical intervention shall follow the rules of the host hospital, state and other applicable local laws.

#### **PR.5 Grievance Procedure**

The CSC 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 CSC 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 CSC policy.

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

CR.3 The CSC 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 Federal and State 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 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 Federal and State law.

#### **MR.4 Required Documentation**

All records must document the following, as appropriate

CR.1 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.2 Admitting diagnosis (if admitted),

CR.3 Results of all consultative evaluations of the patient and appropriate findings by clinical and other staff involved in the care of the patient,

CR.4 Documentation of complications, organization acquired infections, and unfavorable reactions to drugs and anesthesia,

CR.5 Properly executed informed written consent forms for procedures and treatments specified by the medical staff, or by Federal or State law if applicable, signed by the patient or his/her authorized representative ([See PR.4 for Alteplase consent policy](#)).

CR.6 All practitioners' orders, nursing notes, reports of treatment, medication records, radiology, laboratory reports, vital signs and any other information necessary to *diagnose*, treat or monitor the patient's condition.

CR.6a Documentation indicating reason if an eligible ischemic stroke patient does not receive IV thrombolytic therapy.

*CR.6b Documentation indicating the assessments of **all** stroke patients, whether they received Alteplase or not, to determine the eligibility/recommendation for endovascular intervention.*

**Note:** Allowable reasons for not performing an endovascular procedure but still including the patient in the numerator may include:

- Diagnosis/documentation excludes eligibility*
- Enrollment in a clinical trial*
- Arrival time that is too late for treatment*
- Deficits that are too severe or too mild*
- Elevated creatinine*
- Advance age*
- Lack of major vessel occlusion*
- Rapid improvement*
- Refusal by patient/family*
- Lack of appropriate surrogate to consent*
- Insufficient evidence to support intervention per treating physician*

CR.6c Assessments, re-assessments, interventions and monitoring (i.e. Post Alteplase) including date and time, per protocol and/or hospital policy.

CR.7 Discharge summary with outcome of hospitalization, disposition of case, and provisions for follow up care.

CR.8 Final diagnosis with completion of medical records within thirty, (30) days following discharge.

## **Physical Environment (PE)**

PE.1 The CSC 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: 2018 DNV GL 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.

**2018-2019 Required metrics are 1, 2, 3, 4, 6, 7, 9, 12, 15, 18, 19, 27, 28, 29.**

#### **2018 UPDATE**

**Metric 5, 8, 13, 21 and 23 are no longer required as of September 1, 2018**

**Please note that 27, 28 and 29 have been added as of September 1, 2018**

**Note: Metrics in bold and with numerator/denominator detail are the CSC metrics measurements that are required. Other metrics noted are optional at this time.**

**For GWTG crosswalk STKs to DNV GL metric numbers and description of changes to the metrics, please [see Addendum B.](#)**

**For description of metric changes, [see addendum B](#)**

#### **CR.1**

**Metric 1: *Percentage of all 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 ischemic stroke or TIA with a deficit at the time of the initial admitting (or neurological consultation note) for whom an NIHSS is documented.

Patients are to be included in the numerator if the NIHSS is recorded in the first admitting note (or in the first neurology consultation note), Patients with acute ischemic stroke treated with IV or IA Alteplase or with an acute endovascular procedure should be included in the numerator only if the NIHSS is performed before the start of these treatments.

##### **Denominator:**

All patients who have an ischemic stroke or TIA with a deficit at the time of the initial admitting or neurology consultation note or who undergo intravenous Alteplase or acute endovascular treatment with complete resolution of their deficit.

**Note:** Patients with a TIA should be included if they still have a deficit at the time of the initial admitting or consultation note.

**CR. 2**

**Metric 2: Percentage of ischemic stroke patients eligible for intravenous thrombolysis who receive it within the appropriate time window.**

**Numerator:**

Patients who arrive within 3 hours of last known well are candidates for Alteplase up to 4.5 hours since last known well and are treated with Alteplase within this time, are to be included in the numerator.

**Denominator:**

Patients who arrive within 3 hours of last known well and are candidates for Alteplase 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 Alteplase is started at another hospital, should be excluded from this metric for the *receiving* CSC, *unless the CSC was consulted on diagnosis and treatment.*

**CR. 3**

**Metric 3: Percentage of patients who are treated for acute ischemic stroke with intravenous thrombolysis whose treatment is started within 60 minutes after arrival.**

**Numerator:**

Patients treated with Alteplase for acute ischemic stroke whose treatment is started within 60 minutes after arrival.

**Denominator:**

All patients treated with intravenous thrombolysis for acute ischemic stroke.

**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 Alteplase is 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 initial imaging workup for all patients who arrive within *8 hours* of last known well.**

**No numerator/ denominator.**

**Note:** Patients should be excluded from this if there is a documented reason for not performing multimodal imaging quickly. *(If advanced imaging study was ordered.) ICH would not necessarily order advance imaging.*

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

*CR.5 Deleted Now embedded in the standards MR.4 CR.6b*

~~Metric 5: Percentage of Ischemic stroke patient seen within 6 hours of the time they were last known well who have documentation that an endovascular recanalization procedure either was performed or was considered and deemed not to be appropriate or possible. A reason should be documented if an endovascular procedure was not performed.~~

**~~Numerator:~~**

~~Number of ischemic stroke patients seen within 6 hours of the time when they were last known well who undergo an endovascular revascularization procedure or are documented not to be a candidate for such a procedure.~~

**~~Denominator:~~**

~~Number of ischemic stroke patients seen within 6 hours of the time when they were last known well.~~

**Note:** Allowable reasons for not performing an endovascular procedure but still including the patient in the numerator may include:

- ~~• Enrollment in a clinical trial~~
- ~~• Arrival time that is too late for treatment~~
- ~~• Deficits that are too severe or too mild~~
- ~~• Elevated creatinine~~
- ~~• Advance age~~
- ~~• Lack of major vessel occlusion~~
- ~~• Rapid improvement~~
- ~~• Refusal by patient/family~~
- ~~• Lack of appropriate surrogate to consent~~
- ~~• Insufficient evidence to support intervention per treating physician~~

**CR. 6**

***Metric 6: Median time from arrival to start of treatment for acute ischemic stroke patients undergoing an endovascular intervention.***

*No Numerator/Denominator*

*The start of treatment is defined here as the start of intra-arterial infusion of a thrombolytic drug or the first pass with a device.*

*If the time that treatment was started cannot be determined accurately, centers may use the time halfway between puncture and completion of the procedure.*

**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  $\geq$  4 point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within ( $\leq$ ) 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).**

**Numerator:**

Ischemic stroke patients who develop a symptomatic intracranial hemorrhage  $\leq$  36 hours after the onset of treatment with IV thrombolytic (Alteplase) therapy, or IA thrombolytic (Alteplase) therapy, or mechanical endovascular reperfusion therapy

**Denominator:**

Ischemic stroke patients treated with IV thrombolytic (Alteplase) therapy only (IVO) or IA thrombolytic (Alteplase) therapy, or who undergo mechanical endovascular reperfusion therapy

**CR. 7 a**

**Metric 7a Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration  $\geq$  4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within ( $\leq$ ) 36 hours after the onset of treatment with intra-venous (IV) thrombolytic (t-PA) therapy only**

**Numerator:**

Ischemic stroke patients who develop a symptomatic intracranial hemorrhage  $\leq$  36 hours after the onset of treatment with IV thrombolytic (Alteplase) therapy only (IVO)

**Denominator:**

Ischemic stroke patients treated with IV thrombolytic (Alteplase) therapy only

**CR. 7 b**

**Metric 7b Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration  $\geq$  4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within ( $\leq$ ) 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).**

**Numerator:**

*Ischemic stroke patients who develop a symptomatic intracranial hemorrhage  $\leq$  36 hours after the onset of treatment with IA thrombolytic (Alteplase) therapy or mechanical endovascular reperfusion therapy*

**Denominator:**

*Ischemic stroke patients treated with IA thrombolytic (Alteplase) therapy or mechanical endovascular reperfusion therapy*

CR. 8 Deleted                      Now embedded in the standards                      MR.4 CR.6b

~~Metric 8: Percentage of acute ischemic stroke patients treated with endovascular interventions that develop significant intracranial hemorrhage within 36 hours of treatment.~~

~~Numerator:~~

~~All patients who undergo endovascular intervention for acute ischemic stroke and have a symptomatic intracranial hemorrhage in the first 36 hours after treatment.~~

~~Denominator:~~

~~All patients who undergo endovascular intervention for acute ischemic stroke.~~

**Note:** Symptomatic intracranial hemorrhage is defined by the presence of a new intracranial hemorrhage on a CT or MRI that is performed within 36 hours of the end of treatment, with documentation in the medical record that there was clinical deterioration and that no other documentation attributes the deterioration to an alternative causation. *(i.e., clinical deterioration  $\geq$  4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage)*

If a center is using a protocol that treats some patients with Alteplase followed by an endovascular procedure, these patients should be included.

**CR. 9**

**Metric 9: Percentage of acute ischemic stroke patients who are treated with intravenous thrombolysis or who undergo endovascular recanalization procedure for whom there is documentation of a *pre-morbid, discharge and 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 during hospitalization, before discharge and approximately 90 days after the stroke, 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 since stroke onset.

CR.10

Metric 10: Percentage of patients undergoing CEA, or carotid angioplasty or stenting, with stroke or death within 30 days of the procedure.

CR.11

Metric 11: Percentage of patients undergoing intracranial angioplasty and/or stenting for atherosclerotic disease with stroke or death within 30 days of the procedure.

**CR.12**

**Metric 12** *SAH and 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.*

**Numerator:**

*The number of SAH patients for whom the Hunt and Hess scale or the World Federation of Neurological Surgeons Scale is documented and the number of ICH patients whom the ICH score and Spetzler-Martin score is documented.*

**Denominator:**

*The sum of the number of SAH patients and the number of ICH patients that underwent surgical intervention.*

**Note:** For a patient to be counted in the numerator, the Hunt and Hess (and GCS) or the World Federation of Neurological Surgeons Scale 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.

The ICH score and Spetzler-Martin score may be determined later after an analysis of imaging.

**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 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.*

**Numerator:**

*The number of SAH patients for whom the Hunt and Hess scale or the World Federation of Neurological Surgeons Scale is documented.*

**Denominator:**

*The sum of the number of SAH patients that underwent surgical intervention.*

**CR.12b**

**Metric 12b 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.**

**Numerator:**

*The number of ICH patients for whom the ICH score and Spetzler-Martin score is documented.*

**Denominator:**

*The sum of the number of ICH patients that underwent surgical intervention.*

**CR.13**

*Deleted no longer required after Aug 1*

~~Metric 13: Median time from admission to start of procedure intended to obliterate a ruptured aneurysm by surgical clipping or endovascular coiling for patients who arrive within 48 hours of the hemorrhage that led directly to admission.~~

~~No Numerator/Denominator~~

~~**Note:** Patients who are not treated should be excluded but the reasons that they were not treated should be recorded. Times should be recorded to the nearest hour.~~

**CR.14**

Metric 14: Percentage of patients with aneurysmal SAH arriving within 48 hours of hemorrhage for whom a coiling or clipping procedure was not started within 36 hours of arrival who have a documented reason for not having undergone coiling or clipping within 36 hours of arrival.

**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 because of hypotension will be considered to be 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.

Patients who arrive at a CSC with documented aneurysmal SAH should receive Nimodipine within 24 hours of admission.

**CR.16**

Metric 16: Percentage of SAH patients with diminished level of consciousness and ventriculomegaly who are treated with EVD.

**CR.17**

Metric 17: Median frequency of noninvasive monitoring performed for surveillance for vasospasm in patients with aneurysmal SAH during the period between 3 and 14 days after SAH.

**CR.18**

**Metric 18: Complication rates for aneurysm coiling and clipping**

**Numerator:**

Patients undergoing coiling or clipping of a ruptured or un- ruptured 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 coiling or clipping of a ruptured or un-ruptured cerebral aneurysm.

**CR.18a**

**Metric 18a**

**Numerator:**

Patients with unruptured cerebral aneurysms undergoing coiling with complications.

**Denominator:**

All patients undergoing coiling of an unruptured cerebral aneurysm

**CR.18b**

**Metric 18b**

**Numerator:**

Patients with a ruptured cerebral aneurysms undergoing coiling with complications

**Denominator:**

All patients undergoing coiling of a ruptured cerebral aneurysm

**CR.18c**

**Metric 18c**

**Numerator:**

Patients with unruptured cerebral aneurysms undergoing clipping with complications

**Denominator:**

All patients undergoing clipping of an unruptured cerebral aneurysm

**CR.18d**

**Metric 18d**

**Numerator:**

Patients with ruptured cerebral aneurysms undergoing clipping with complications

**Denominator:**

All patients undergoing clipping of a ruptured cerebral 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.

For ruptured aneurysms, only consider ischemic strokes and death within 24 hours of the procedure.

**CR.19**

***Metric 19: Intracerebral hemorrhage (ICH) stroke patients with an INR value > 1.4 at hospital arrival who are treated with a procoagulant reversal agent (i.e., fresh frozen plasma, recombinant factor VIIa, prothrombin complex concentrates)***

***Numerator:***

*ICH stroke patients treated with a procoagulant reversal agent.*

***Denominator:***

*ICH stroke patients with INR > 1,4 at hospital arrival*

**Note:** Patients with an elevated INR should be excluded from this if a reason is documented for not treating them, for example, if there is a decision to treat the patient with comfort measures only or if the risks of reversing anticoagulation are judged to outweigh the benefits. Times for this metric should be recorded in minutes.

CR.20

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

CR.21

Metric 21: Percentage of patients with ischemic or hemorrhagic stroke or TIA transferred from another hospital to the CSC with documentation of the time from the first call from the transferring hospital to the CSC (to a member of a stroke program or to a centralized transfer center) to arrival time at the CSC.

CR.22

Metric 22: Percentage of patients admitted to each type of unit to which patients with ischemic or hemorrhagic stroke or TIA are initially admitted (e.g., neurological/neurosurgical ICU, medical ICU, surgical ICU, general ICU, coronary care unit, burn ICU, stroke unit, other intermediate-level-of-care unit, neurology floor, or other designated floor). A separate percentage should be calculated for each type of unit.

CR.23 *retired as of September 1 2018*

Metric 23: Percentage of patients with stroke or death within 24 hours of diagnostic neuroangiography.

**Numerator:**

Patients with death or stroke after diagnostic neuroangiography within 24 hours of the procedure or before discharge, whichever comes first.

**Denominator:**

All patients who undergo a diagnostic neuroangiographic procedure.

**Note:** Exclude patients if they have undergone a therapeutic angiographic intervention as part of the same procedure or within the first 24 hours after the diagnostic procedure unless the complication is identified before the therapeutic intervention.

CR.24

Metric 24: Percentage of patients who have a diagnosis of ischemic or hemorrhagic stroke who undergo EVD and then develop ventriculitis.

CR.25

Metric 25: Median number of days from admission to completion of evaluations for physical therapy, occupational therapy, speech-language pathology, and rehabilitation medicine, unless there is documentation on admission that some or all of these evaluations are not needed or that the patient cannot tolerate them because of medical instability.

CR.26

Metric 26: Percentage of patients admitted with diagnoses of ischemic stroke, SAH, AVM, intracranial hemorrhage, extracranial cervical stenosis, intracranial stenosis, or TIA who are enrolled in a clinical research study.

**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 treatment with intra-arterial (IA) thrombolytic (t-PA) therapy and/or mechanical endovascular reperfusion therapy*

**Numerator:**

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

**Denominator:**

*Ischemic stroke patients treated with IA thrombolytic (Alteplase) therapy and/or 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 ( $\geq 0$  min. and  $\leq 150$  min.) 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 ( $\geq 0$  min. and  $\leq 150$  min.) 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 (time of first pass or deployment of device) and achieve TICI 2B or higher less than (<) or equal to 60 minutes from the time of skin puncture.*

**Numerator:**

*Ischemic stroke patient 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: 2018 DNV GL /GWTG Comprehensive Stroke Center Crosswalk for Metric Requirements

DNV GL Required CSC Measures	2015 CSC Metric	2018 Metric	AHA / ASA Measure	ASA Description	Accept AHA Measures	Legend	Further Information
Metric 1	Percentage of patients who have an ischemic stroke or who have a TIA with a deficit at the time of the initial admitting note or neurology consultation note for whom an initial NIHSS score is documented upon initial stroke assessment NIHSS is to be used for scoring deficits.	Percentage of all stroke/TIA patients who have a deficit at the time of the initial RN greet note, ED Physician or neurology consultation note for whom an NIHSS score is documented.	<b>CSTK01</b>	Ischemic stroke patients for whom an initial NIHSS score is performed prior to any acute recanalization therapy (i.e., IV thrombolytic (t-PA) therapy, or IA thrombolytic (t-PA) therapy, or mechanical endovascular reperfusion therapy) in patients undergoing recanalization therapy and documented in the medical record OR documented within 12 hours of arrival at the hospital emergency department for patients who do not undergo recanalization therapy.	No	NIHSS is used to support many treatment discussions. Obtaining the NIHSS from the RN or Physician as soon as possible is essential to facilitate the appropriate treatment options(s)	Must use DNV GL definition for abstraction
Metric 2	Percentage of ischemic stroke patients eligible for intravenous thrombolysis who receive it within the appropriate time window.	Percentage of ischemic stroke patients eligible for intravenous thrombolysis who receive it within the appropriate time window.	IV tPA Arrive by 2.5 Hours, treat by 3.5 Hour Arrive by 3.5 treat by 4.5	Percent of acute ischemic stroke patients who arrive at the hospital within 120 minutes (2 hours) of time last known well and for whom IV t-PA was initiated at this hospital within 180 minutes (3 hours) of time last known well.	Yes		Located in GWTG Admission Tab IV Thrombolytic Therapy

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DNV GL Required CSC Measures	2015 CSC Metric	2018 Metric	AHA / ASA Measure	ASA Description	Accept AHA Measures	Legend	Further Information
Metric 3	Percentage of patients who are treated for acute ischemic stroke with intravenous thrombolysis whose treatment is started within 60 minutes after arrival.	Percentage of patients who are treated for acute ischemic stroke with intravenous thrombolysis whose treatment is started within 60 minutes after arrival.	Time to Intravenous Thrombolytic Therapy - 60 min	Percent of acute ischemic stroke patients receiving intravenous tissue plasminogen activator (tPA) therapy during the hospital stay who have a time from hospital arrival to initiation of thrombolytic therapy administration (door-to-needle time) of 60 minutes or less	Yes		Located in GWTG Admission Tab IV Thrombolytic Therapy
Metric 4	Median time from arrival to start of multimodal CT or MR brain and vascular imaging (MRI/MRA or CT/CTA) for ischemic stroke patients arriving within 6 hours of the time that they were last known well, if one of the studies have been ordered.	Median time from arrival to start of multimodal CT or MR brain and vascular imaging (MRI/MRA or CT/CTA) for ischemic stroke patients arriving within 8 hours of the time that they were last known well, if one of the studies have been ordered.	Door to CT within 8 hours Last Known Well	Time from triage to initial imaging work-up for all patients who arrive within 8 hours from time Last Known Well NOTE: If advanced imaging study was ordered. Not everyone will need advanced imaging. Example: ICH - would not necessarily do hyper acute advanced imaging.	Yes	DNV GL Changed time from 6 to 8 hours	Located in GWTG Hospitalization Tab Brain Imaging
Metric 5	Percentage of Ischemic stroke patient seen within 6 hours of the time they were last known well who have documentation that an endovascular recanalization procedure either was performed or was considered and deemed not to be appropriate or possible. A reason should be documented if an	Embedded in the standards Medical Record	<b>No ASA CSTK</b>	No ASA definition	Not a ASA measure DNV GL definition	This is in the standards MR.4 CR.6b	Deleted Now embedded in the standards <b>MR.4 CR.6b</b>



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	endovascular procedure was not performed.						
Metric 6	Median time from arrival to start of treatment for acute ischemic stroke patients undergoing an endovascular intervention.	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), (i.e., intra-arterial (IA) thrombolytic (t-PA) infusion and/or mechanical embolectomy devices), of acute ischemic stroke.	<b>CSTK-09</b>	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), (i.e., intra-arterial (IA) thrombolytic (t-PA) infusion and/or mechanical embolectomy devices), of acute ischemic stroke.	Yes	DNV GL Adopted this measure	Located in GWTG Comprehensive tab
Metric 7	Percentage of patients treated with intravenous thrombolysis who have a symptomatic intracranial hemorrhage within 36 hours of treatment.		<b>CSTK-05</b>	Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration $\geq$ 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within ( $\leq$ ) 36 hours after the onset of treatment with intravenous (IV) or intra-arterial (IA) thrombolytic (t-PA) therapy, or mechanical endovascular reperfusion procedure (i.e., mechanical endovascular thrombectomy with a clot retrieval device).	Yes	DNV GL Adopted this metric to further define symptomatic bleeds. Centers can abstract non-symptomatic bleeds and report on it, but it is not mandatory	Located in GWTG Comprehensive Tab Aligns with CSTK-05

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Metric 7a		Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration $\geq$ 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within ( $\leq$ ) 36 hours after the onset of treatment with intra-venous (IV) thrombolytic (t-PA) therapy only	<b>CSTK-05A IV Alteplase only</b>	Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration $\geq$ 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within ( $\leq$ ) 36 hours after the onset of treatment with intra-venous (IV) thrombolytic (t-PA) therapy only	Yes	DNV GL Adopted this metric to further define symptomatic bleeds. Centers can abstract non-symptomatic bleeds and report on it, but it is not mandatory	Located in GWTG Comprehensive tab Aligns with CSTK-05a
Metric 7b			<b>CSTK-05B IA thrombolytic (t-PA) therapy or mechanical endovascular reperfusion therapy (i.e., mechanical endovascular thrombectomy with a clot retrieval device).</b>	Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (i.e., clinical deterioration $\geq$ 4-point increase on NIHSS and brain image finding of parenchymal hematoma, or subarachnoid hemorrhage, or intraventricular hemorrhage) within ( $\leq$ ) 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).	Yes	DNV GL Adopted this metric to further define symptomatic bleeds. Centers can abstract non-symptomatic bleeds and report on it, but it is not mandatory	Located in GWTG Comprehensive tab Aligns with CSTK-05b

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Metric 8	Percentage of acute ischemic stroke patients treated with endovascular interventions who develop significant intracranial hemorrhage within 36 hours of treatment.		Matches CSTK05			Not in GWTG	<i>Deleted 7/1/2018</i>
Metric 9	Percentage 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.	Percentage 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.	Modified Rankin Score (mRS) at 90 days HISTORIC CSTK 02	Ischemic stroke patients treated with intra-venous (IV) or intra-arterial (IA) thrombolytic (t-PA) therapy or who undergo mechanical endovascular reperfusion therapy for whom a 90 day (≥75 days and ≤105 days) mRS is obtained via telephone or in-person	No	ASA Suspended CSTK 02	DNV GL will continue to have sites measure the 90 day mRS
Metric 9 (cont')			<b>CSTK-10</b>	Ischemic stroke patients treated with intra-venous (IV) or intra-arterial (IA) thrombolytic (t-PA) therapy or who undergo mechanical endovascular reperfusion therapy and have a mRS less than or equal to 2 at 90 days (≥75 days and ≤105 days)	No	This is the GWTG new definition for mRS	DNV GL will not use this definition to collect the 90 day mRS

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Metric 12	Percentage of SAH patients for whom initial severity measures are documented.	SAH and 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.	<b>CSTK 03</b>	SAH and 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.	Yes	DNV GL has adopted this definition that is in GWTG for initial severity measures	Can use the GWTG CSTK
Metric 12a		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.	<b>CSTK-03a</b>	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.	Yes	DNV GL has adopted this definition that is in GWTG for initial severity measures	Can use the GWTG CSTK

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Metric 12b		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.	<b>CSTK - 03B</b>	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.	Yes	DNV GL has adopted this definition that is in GWTG for initial severity measures	Can use the GWTG CSTK
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 21 days after the SAH.	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.	<b>CSTK-06</b>	Subarachnoid hemorrhage (SAH) patients for whom nimodipine treatment was administered within 24 hours of arrival at this hospital	No	Subarachnoid hemorrhage (SAH) patients for whom nimodipine treatment was administered within 24 hours of arrival at this hospital	DNV GL metric is more detailed than the GWTG definition and is required

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Metric 18a	Patients with <b>unruptured</b> cerebral aneurysms undergoing <b>coiling</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any re-bleeds and/or second treatment of residual aneurysm within 30 days of the procedure	Patients with <b>unruptured</b> cerebral aneurysms undergoing <b>coiling</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any re-bleeds and/or second treatment of residual aneurysm within 30 days of the procedure	<b>CSTK-07 retired</b>	Nothing current in GWTG	No	Not in GWTG. This is an important measure to track and report regarding cerebral aneurysms.	DNV GL metric is more detailed than the GWTG definition and is required
Metric 18b	Patients with <b>ruptured</b> cerebral aneurysms undergoing <b>coiling</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any re-bleeds and/or second treatment of residual aneurysm within 30 days of the procedure	Patients with <b>ruptured</b> cerebral aneurysms undergoing <b>coiling</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any rebleeds and/or second treatment of residual aneurysm within 30 days of the procedure	<b>CSTK-07 retired</b>	Nothing current in GWTG	No	Not in GWTG Important metric would need to be collected manually	DNV GL metric is more detailed than the GWTG definition and is required

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Metric 18c	Patients with <b>unruptured</b> cerebral aneurysms undergoing <b>clipping</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any rebleeding and/or second treatment of residual aneurysm within 30 days of the procedure	Patients with <b>unruptured</b> cerebral aneurysms undergoing <b>clipping</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any rebleeding and/or second treatment of residual aneurysm within 30 days of the procedure	<b>CSTK-07 retired</b>	Nothing current in GWTG	No	Not in GWTG Important metric would need to be collected manually	DNV GL metric is more detailed than the GWTG definition and is required
Metric 18d	Patients with <b>ruptured</b> cerebral aneurysms undergoing <b>clipping</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any re-bleeding and/or second treatment of residual aneurysm within 30 days of the procedure	Patients with <b>ruptured</b> cerebral aneurysms undergoing <b>clipping</b> with complications who have complications of death, stroke or bleed within 24 hours of procedure or any re-bleeding and/or second treatment of residual aneurysm within 30 days of the procedure	<b>CSTK-07 retired</b>	Nothing current in GWTG	No	Not in GWTG Important metric would need to be collected manually	DNV GL metric is more detailed than the GWTG definition and is required

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Metric 19	Median time from arrival to start of treatment to reverse the INR with a procoagulant preparation (e.g., fresh frozen plasma, recombinant factor VIIa, prothrombin complex concentrates) for patients with warfarin-associated ICH and an elevated INR (INR > 1.4).	Intracerebral hemorrhage (ICH) stroke patients with an INR value > 1.4 at hospital arrival who are treated with a procoagulant reversal agent (i.e., fresh frozen plasma, recombinant factor VIIa, prothrombin complex concentrates)	<b>CSTK 04</b>	Intracerebral hemorrhage (ICH) stroke patients with an INR value > 1.4 at hospital arrival who are treated with a procoagulant reversal agent (i.e., fresh frozen plasma, recombinant factor VIIa, prothrombin complex concentrates)	Yes	DNV GL has adopted this definition that is in GWTG CSTK	Can use the GWTG CSTK
<b>Metric 27</b>	Thrombolysis in Cerebral Infarction (TICI Post-Treatment Reperfusion Grade)	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 treatment with intra-arterial (IA) thrombolytic (t-PA) therapy and/or mechanical endovascular reperfusion therapy	<b>CSTK-08</b>	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 treatment with intra-arterial (IA) thrombolytic (t-PA) therapy and/or mechanical endovascular reperfusion therapy	Yes	DNV GL has adopted this definition that is in GWTG CSTK	Can use the GWTG CSTK



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<p><b>Metric 28</b></p>	<p><i>Timeliness of Reperfusion: Arrival Time to TICI 2B or Higher</i></p>	<p><i>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 (&gt;= 0 min. and &lt;= 150 min.) of hospital arrival and achieve TICI 2B or higher at the end of treatment</i></p>	<p><b>CSTK-11</b></p>	<p><i>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 (&gt;= 0 min. and &lt;= 150 min.) of hospital arrival and achieve TICI 2B or higher at the end of treatment</i></p>	<p>Yes</p>	<p><i>DNV GL has adopted this definition that is in GWTG CSTK</i></p>	<p><i>Can use the GWTG CSTK-11</i></p>
<p><b>Metric 29</b></p>	<p><i>Timeliness of Reperfusion: Skin Puncture to TICI 2B or Higher</i></p>	<p><i>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) and achieve TICI 2B or higher less than (&lt;) or equal to 60 minutes from the time of skin puncture.</i></p>	<p><b>CSTK-12</b></p>	<p><i>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 (&lt;) or equal to 60 minutes from the time of skin puncture.</i></p>	<p>Yes</p>	<p><i>DNV GL has adopted this definition that is in GWTG CSTK</i></p>	<p><i>Can use the GWTG CSTK</i></p>

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DNV GL Healthcare USA, Inc.  
400 Techne Center Drive, Suite 100  
Milford, OH 45150  
Phone 513-947-8343  
Fax 513-947-1250

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