Yale New Haven Health

Department of Patient Services

Ischemic Stroke (Adult)- Nursing Care of the Patient Eligible for IV Thrombolytic Therapy and/or Acute Neurological Intervention (Mechanical Endovascular Reperfusion - MER)

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Approved by: [Stroke Service, NICU, Vascular Neurosurgery]

Purpose:
To outline the nursing care of the patient who presents with acute stroke symptoms and is eligible to receive IV / IA thrombolytic therapy and/or a mechanical endovascular reperfusion (MER) - thrombectomy procedure.

Definitions:
IV thrombolysis: the administration of an intravenous or intra-arterial fibrinolytic medication to break down blood clots formed in a blood vessel

Mechanical Endovascular Reperfusion (MER): Removal of a blood clot from a blood vessel using a specialized catheter and guidewire that is threaded through the artery leading to the specific area in the brain that is causing blockage of blood flow

Background:
Patients presenting to Yale New Haven Health System facilities with acute focal neurological symptoms within 24 hours of last known well are urgently evaluated by calling a stroke code. Patients deemed eligible for IV thrombolysis and/or MER will be admitted to the intensive care unit for post-procedure care and secondary stroke prevention.

Standard Operating Procedure:
This guideline for nursing pertains to the care of the ischemic stroke patient who is status post IV thrombolysis +/- MER. These guidelines are relevant once the patient has been transferred from the ED, inpatient unit or IR suite to the next level of care (including the NICU/PACU/other ICU).

Admission Assessment:
It is recommended that the following order-sets be used for patients admitted to an ICU post procedure: NEU-IP ISCHEMIC STROKE ICU/ALTEPLASE ADMISSION and NEU-IP MECHANICAL THROMBECTOMY/INTRA-ARTERIAL INTERVENTION (If the patient undergoes a MER procedure following IV thrombolytics, the Alteplase admission order-set can be retired.)

- Establish Ischemic Stroke Individualized Care Plan
- Vital Signs and Neurological Assessments as ordered – NIHSS on admission and
    - Every 15 minutes (+/- 5 minutes) x 2 hours
    - Every 30 minutes (+/- 10 minutes) x 6 hours
    - Every 1 hours (+/- 15 minutes) x 16 hours

      NOTE: For MER procedures, the above monitoring frequency will begin with the establishment of hemostasis at the access site – noted as “Manual Pressure Released”; “Compression Device Applied”; “Closure Device Deployed”; “Sheath Sewn into Place”. (Refer to the Mechanical Endovascular Reperfusion / Intra-arterial thrombolysis Protocol for details related to patient

assessments post procedure). At the time of the IR-ICU/PACU hand-off, the timing of the subsequent assessment will be verified to maintain accurate assessment timing.

- Notify the provider if there is an increase in the NIHSS by two or more points from previous assessment or if the patient experiences a deterioration in their neurological status.
- Peripheral Vascular Assessments
    - Assess Puncture Site(s)
    - Assess Distal Pulses
    - Assess Neck circumference (if carotid access)
    - TR band assessment
        - Q 15 minutes (+/- 5 minutes) x 4
        - Q 30 minutes (+/- 10 minutes) x 4
        - Q 1 hour (+/- 15 minutes) x 4
        - Q 4 hours (+/- 30 minutes) while awake
    - Avoid invasive catheter insertion x 24 hours if the patient received IV thrombolysis
    - See orders for femoral sheath/leg immobilizer per MD
- Goal $Sp0_2$ > 94%
- Perform the Aspiration Risk Assessment prior to any PO (food/fluids/meds) intake (refer to the Aspiration Risk Assessment a.k.a. the Yale Swallow Protocol Standard Operating Procedure).
- Consider requesting a nutrition consult to meet calorie needs
- Establish blood pressure parameters post IV thrombolytics and during/post MER: (systolic BP < 180 mmHg: diastolic BP < 105 mmHg or per provider order)
- If administering PRN medications for blood pressure control, recheck the blood pressure 1 hr after administration unless otherwise directed by the provider.
- Check blood glucose per provider order; notify provider if FS or serum blood glucose ≤ 60 mg/dl or as ordered in the parameters.
- Hemoglobin A-1C is ordered for all stroke/TIA patients unless documented within the last 30 days
- Keep HOB > 30 degrees to avoid aspiration unless the covering provider provides direction for HOB based on the patient's neurological status.
- PRN pain management orders will be limited to administering medications for documented evidence of "mild" pain (scale 0-3); pain scores > 3 will be reviewed with the covering provider.
- Activity per MD orders (see orders related to sheath placement and leg immobilizer).

Ongoing Care (after 24 hours)

- Perform neuro checks (*focused stroke exam 2020 proposal pending*) per unit protocol or per MD/LIP order
- Perform vital signs (BP, HR, SpO2, temp), as ordered by the provider
- Continuous telemetry monitoring.
- Collaborate with the provider to order a 24-hour (+/- 12 hours) stability brain CT w/out contrast or MRI brain without contrast.
- Anticipate additional diagnostic testing which may include but not limited to echocardiography; trans-esophageal echocardiogram; carotid ultrasound; lower extremity Doppler studies.
- Ensure DVT prophylaxis is ordered and documented by the end of hospital Day #2
- Ensure anti-thrombotic therapy is ordered and administered by the end of hospital Day #2
- Assess fall risk
- Ensure rehabilitation services are ordered; treatment plan is documented
- Address bowel and bladder function daily
- Collaborate with rehabilitation services to coordinate mobility, ambulation and periodic therapy needs
- Provide daily stroke education (Take 5 stroke packet) to the patient and/or caregiver as appropriate – refer to the following required elements; if unable to provide education, document specific barriers:
    - Warning signs of stroke
    - Activating EMS via 9-1-1
    - Knowing individual stroke risk factors
    - Reviewing medications for stroke prevention
    - Discussing follow-up healthcare appointment after hospital admission

- Consider a stroke nurse navigator consult for coordination of care
- Review anticipated diagnostic test/procedures with the patient and family

Coordination of Transfer to the Stroke Service

- Collaborate with the ICU team to determine hemodynamic and neurological stability for transfer to the floor
- Consider patient and family information document to explain transition of care
- Routine ICU -> floor handoff
- Review orders and appropriateness for level of care

As a certified stroke center, the following selected stroke performance measures are monitored for compliance and documentation:

- Patients are examined using the NIHSS assessment within the first 12 hours after admission
- Patients are evaluated for aspiration risk prior to any PO intake using the Aspiration Risk Assessment (aka the Yale Swallow Protocol).
- DVT prophylaxis is ordered and provided/documented by the end of hospital day #2. If patients refuse one modality of DVT prophylaxis, they may be offered an alternative. Any reason for not providing and documenting DVT prophylaxis requires documentation of the *reason* why it is not provided - see order "CORE" or "REASON".
- Patients are candidates for anti-thrombotic medication by the end of hospital day #2. Any reason for not providing and documenting DVT prophylaxis requires documentation of the *reason* why it is not provided - see order "CORE" or "REASON".
- Patients are candidates for statin therapy prior to discharge. Any reason for not providing and documenting DVT prophylaxis requires documentation of the *reason* why it is not provided - see order "CORE" or "REASON".
- Patients are candidates for anti-thrombotic medication prior to discharge. Any reason for not providing and documenting DVT prophylaxis requires documentation of the *reason* why it is not provided - see order "CORE" or "REASON".
- Patients are candidates for a rehabilitation assessment prior to discharge. Any reason for not providing and documenting DVT prophylaxis requires documentation of the *reason* why it is not provided - see order "CORE" or "REASON".
- Patients and caregivers are provided with stroke education during their hospitalization. Education of the 5 required elements of stroke recovery is documented daily for the first 5 days or until discharge, whichever comes first. Stroke education for patients with extended stays will be assessed by the bedside nurse and stroke nurse navigator as appropriate with reinforcement of pertinent elements on the day of discharge. All stroke patients will be provided with Take 5 stroke packet, if appropriate.

As a certified Advanced Comprehensive Stroke Center (YSC), the following additional selected ischemic stroke performance measures are monitored for compliance and documentation:

- Patients are monitored for symptomatic hemorrhagic transformation within 36 hours after IA alteplase or MER
- Percentage of ischemic patients with a post-treatment reperfusion grade of a TICI 2B or higher
- Median time from hospital arrival to the time of skin puncture to accessing the artery for MER
- Ischemic stroke patients with a TICI 2B-TICI 3 post MER within 150 mins (YNHH) and 120 mins (OSH) of arrival
- Ischemic stroke patients with a TICI 2B-TICI 3 post MER within 90 mins (YNHH) and 60 mins (OSH) of arrival

REFERENCES:

2018 AHA Guidelines for the Early Management of Ischemic Stroke
2016 AHA Guidelines for Adult Stroke Rehabilitation and Recovery
2015 J NeuroIntervent Surg; 7:316–321. Embolectomy for Stroke with Emergent Large Vessel Occlusion
2015 Intervent Neurol. 2015; 4:138–150. Mechanical Thrombectomy-Ready Comprehensive Stroke Center Requirements and Endovascular Stroke Systems of Care.