Alternative Stroke Guidelines in Response to COVID-19

These guidelines are strictly meant to provide a reference for stroke patient triage and management during ICU/bed capacity issues during the Coronavirus (COVID-19) pandemic crisis. We are utilizing published evidence to support these changes in anticipation of changes in delivery of care with the current environment/situation. There has not been an approved change in standards of care.

Goals:

- Provide stroke interventions to all stroke patients, per standard of care, during the COVID pandemic
- Have tiered level approach to stroke patient placement and management based on bed availability and COVID surge
- Offload volume, as able, from the ICU. May need to consider alternate assessment pathways, when ICU resource beds are limited (i.e. OPTMIST assessment frequency)
- Provide clinical guidelines as a reference for stroke teams to use for patients requiring stroke care outside of ICU's, stroke units and by non-neuro RNs
- Provide safe and thorough care while also decreasing diagnostic testing and improving throughput and discharge
- Work with AHA/ASA on Regional EMS needs and recommendations on IL region stroke transfers (coordinated through PCC)
- Daily debriefs with stroke system leaders and site stroke coordinators

STROKE TIER LEVELS -

***Determination of current tier level is decided at each site on a case by case basis**

***Acute Stroke Ready Hospitals: Refer to addendum below for specialized tiering**

1st level - We are keeping the same approved indications for treatment and disposition

2nd level - Patients will be sent to Non- ICU beds but neuro floors + neuro nurses

3rd level - Patient will be sent to any available bed with general nurses (crash course in neuro)

4th level – Patient will need to be transferred to another AAH site due to lack of any available bed

5th level – Transfer patient to non AAH hospital

- Expectations: All team members are aware of patients in modified locations/using modified protocols. This includes, but is not limited to, Neurointensivist, Neurovascular surgeon, Neurologist, Hospitalist, nursing leadership of stroke units, incident command
- Initiation of alternate guidelines is to be done in accordance with primary neuro and primary medical team.
- Clinical decision points to implement guidelines:
    - Post alteplase monitoring: Neurointensivist or Intensivist or Stroke Neurologist
    - Post alteplase with or without thrombectomy: Neurovascular interventionalist *in collaboration with Neurointensivist or Intensivist or Stroke Neurologist*

- Thrombectomy alone: Neurointensivist and/or stroke neurologist in collaboration with Neurovascular interventionalist
- ED should place bed order for critical care bed or NCCU and speak with Intensivist/Neurointensivist who can make decision for patient placement. If patient to be placed on non-ICU unit, Neurointensivist/Intensivist will change/downgrade bed request and communicate with Neurologist and Hospitalist.
- Charge nurse on non-ICU unit will be notified to adjust staffing ratio.

Recommended Criteria for the NON-ICU Post Alteplase and/or Thrombectomy

**Non- COVID positive/Non-PUI Patient

- Note: An increased frequency of assessments may be indicated for intervention patients admitted to a non-ICU setting.
- Age $\geq$ 18 years
- Received IV Alteplase for acute ischemic stroke according to standard criteria
- Mild stroke, defined by NIHSS $\leq$ 10
- Telemetry monitoring capability required
- Stable and without critical care needs at the end of the IV Alteplase infusion and/or mechanical thrombectomy
  - Patients without critical care needs (e.g. BP control needs, respiratory compromise (including intubation), cardiac/hemodynamic instability, continuous infusions requiring titration, new A Fib with uncontrolled rate)
  - Patients not being monitored for malignant edema/crani watch
- Post Alteplase AND/OR Post thrombectomy with Alteplase monitoring. Post thrombectomy initial recovery should be completed by IR/PACU/critical care overflow for first 3 hours of monitoring
  *Below are recommended alternative assessments guidelines for a site that does not have an ICU bed post alteplase/thrombectomy (as staffing and resources allow):
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Illinois	Wisconsin
• Every 15 minutes x 2 hours • Every 30 minutes x 6 hours • Every 1 hour x 4 hours • Every 2 hours x 4 hours • Every 4 hours per unit routine	• Every 15 minutes x 2 hours • Q 1 hour x 1hour • Every 2 hours x 8 hours • Every 4 hours x 16 hours

- Post Thrombectomy (without IV Alteplase) initial recovery should be completed by IR/PACU/critical care overflow for first 3 hours of monitoring. Follow site specific surge plans to determine specific department

Illinois	Wisconsin
• Every 15 minutes x 1 hour • Every 30 minutes x 1 hours • Every 1 hour x 4 hours • Every 4 hours per unit routine	• Every 15 minutes x 2 hours • Q 1 hour x 1hour • Every 2 hours x 8 hours • Every 4 hours x 16 hours

- Recommended staffing and staffing ratios for these patients
  - 1:2 for first 8 hours- no more than 1:3 when staffing allows
  - 1:3 for next 16 hours
  - Utilize RN with Critical Care and/or neuro experience when possible.
  - Consider utilizing available RN with groin site management experience

Recommended Low Intensity Monitoring: Criteria for Both the ICU and NON-ICU Post Alteplase and/or Thrombectomy

**COVID positive AND PUI Patient

- Patient in Site Designated COVID unit (ICU or non-ICU) per site incident command center
- Age ≥ 18 years
- Received IV Alteplase and/or mechanical thrombectomy for acute ischemic stroke according to standard criteria
- Mild stroke, defined by NIHSS ≤ 10
- Telemetry monitoring capability required
- Stable and without critical care needs at the end of the IV Alteplase infusion and/or mechanical thrombectomy
  - Patients without critical care needs (e.g. BP control needs, respiratory compromise (including intubation), cardiac/hemodynamic instability, continuous infusions requiring titration, new A Fib with uncontrolled rate)
  - Patients not being monitored for malignant edema/crani watch
- Low intensity vital sign, puncture site, vascular and neurological exam monitoring schedule:
  - Every 15 minutes x 2 hours
  - Q 1 hour x 1hour
  - Every 2 hours x 8 hours
  - Every 4 hours x 16 hours
- If patient status post IV alteplase and thrombectomy, recommend restarting the clock for post procedure monitoring. As outlined in above bullet point.
- Illinois only: If patient post thrombectomy only (no IV Alteplase)
  - Every 15 minutes x 1 hour
  - Every 30 minutes x 1 hours
  - Every 1 hour x 4 hours
  - Every 4 hours per unit routine

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- Modified NIHSS, abbreviated neurological exams are reasonable in setting of COVID +/PUI patients. Assessment of presenting symptoms is key.
- Recommended staffing ratios for these patients
    - 1:2 for first 2 hours
    - 1:3 for next 22 hours

    - Utilize RN with Critical Care and/or neuro experience when possible.
    - Consider utilizing available RN with groin site management experience

Non-ICU staff education to include:

POST ALTEPLASE (T-PA) ADMINISTRATION (Please use monitoring tool as a guide)

- Vital Signs + Neuro assessments (neurological + neuromuscular)
  **See recommended guidelines outlined above
  **All vital signs and assessments must be documented in EMR
  *Assessments can be done early, never late
- Post IV Alteplase: BP must be < 180/105; if any are elevated, a note must be attached to the BP. (Note can say MD, NP notified, Pt moving, will reassess, titrating medication, etc.). Please enter an additional BP before the next scheduled BP.
- Post Thrombectomy: BP parameters per the provider discretion but typically will maintain SBP 120-160. Check the provider order.
- If patient develops severe headache, worsening neurological symptoms, marked BP changes, nausea/vomiting, allergic reaction/angioedema notify the physician and anticipate a STAT CT scan. IF TPA IS STILL INFUSING, PLEASE DISCONTINUE PRIOR TO NOTIFYING THE PHYSICIAN.
    - Allergic reaction/response to Alteplase: rash, hives, difficulty breathing, tightness in the chest, swelling of the mouth, face, lips or tongue (angioedema)
- The majority of sICHs occur within the first few hours of treatment (mean time Alteplase administration to sICH of 8.5 hours with more than 80% occurring within first 12 hours post Alteplase treatment)

Alteplase administration for in-house stroke alert

- Critical care nurse must be present to administer on a non-ICU unit
- If above not available patient must be moved to ICU bed for administration

NeuroIR Lab, Thrombectomy and Intubation Considerations

- Recommend same approved criteria to treat and maintain for intervention in Acute Stroke
- All patients should be screened using universal screening questions-see clinical pathway, if screened positive follow droplet/contact and eye protection PPE guidance See PPE Grid
- Minimize imaging on COVID positive patients
    - Get CT/CTA/CT perfusion on spoke hospital
    - Consider flat panel CT (dynaCT) imaging while in angio suite
- Always use personal protective equipment (PPE) following standard procedure.
- Create an area outside of the room for appropriate donning and doffing
- In confirmed cases of COVID 19 (positive)
    - Low threshold for intubation (see list of intubation recommendations below)
    - Intubation to be done prior to coming to the angio suite by intubation team

    - Use extra-long ET extension tubing to permit free movement around the angiosuite
    - Consider use a portable ventilator during acute neuro interventions and IV sedation to minimize opening the circuit
    - Follow PPE Resource grid, if Aerosolizing procedure is to be performed
- Minimize the number of team members in the room
- Consider to prepare one angio suite for interventions with only an emergency device cart
- Post procedure extubating should be done outside of the angio suite (negative pressure environment or covid unit)
- The angiosuite should undergo standard airborne contact cleaning procedure post intervention for a COVID positive patient. Keep no devices in the room (only emergency device cart) or cabinets closed during intervention. timing of cleaning should be completed per environmental services protocol.
- We recommend when safe to consider non-ICU beds for recovery and work-up
- All stroke patients should be considered for COVID 19 testing

Consider intubation if:

Acute respiratory distress

Hypoxia

Cough

Inability to protect airway due to neurological deficit

Nausea/Vomiting

Posterior circulation (vertebrobasilar) occlusion

Aphasia/inability to follow commands

NIHSS >15 or GCS <9

Agitation/uncooperative

Addendum: Acute Stroke Ready Recommendations/Tiers

1st level – Transfer per normal protocol to usual accepting site

2nd level – Transfer to any AAH ICU

3rd level – Keep in site ICU or transfer to AAH neuro medical

4th level – Transfer to AAH non-neuro Medical

5th level – Transfer patient to non AAH hospital

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References:

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