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Ramana received her MD from George Washington University in D.C. and did Emergency Medicine residency at Johns Hopkins Hospital in Baltimore. Ramana is associate professor and serves as ED physician champion for stroke at VCU. She enjoys spending time with her family, friends, and misses being able to travel.

Sara Watkins MSN, RN, SCRN

Stroke Program Coordinator
Riverside Regional Medical Center

Sara received her Bachelors of Science in Nursing from Barton College in 2012, and her Masters of Science in Nursing with a concentration in leadership from Barton College in 2018. Sara maintains her certification as a Stroke Certified Registered Nurse. Sara's interest is improving stroke care within the community. She enjoys spending time with her family and two dogs Toto and Ozzie.

ACUTE STROKE TREATMENT STRATEGIES WORKGROUP

Development and Adaptability During COVID-19

V. Ramana Feeser MD & Sara Watkins MSN, RN, SCRN

Disclosures

- No Disclosures

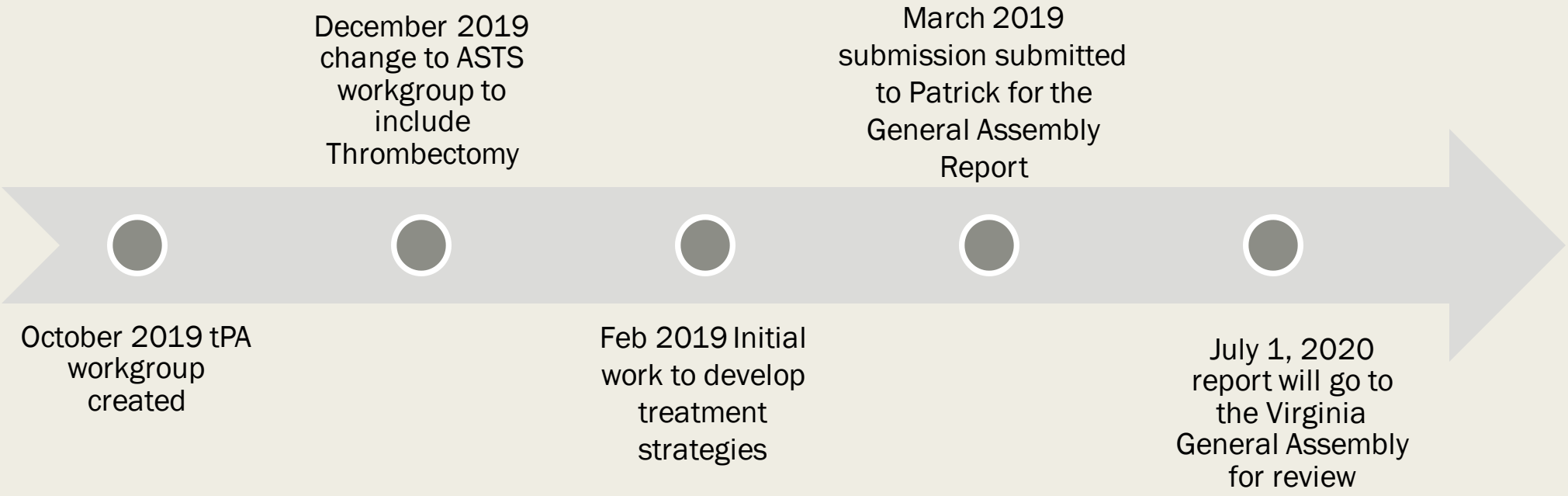
Objectives

- Overview of ASTS Workgroup
- What is COVID-19?
- COVID-19 and Stroke
- Challenges and Considerations

VSSTF Acute Stroke Treatment Strategies Workgroup

- Purpose: To promote utilization of tPA and best practices and collect data under the Stroke Care Quality Improvement Advisory Group, educate providers and raise awareness and address existing perspectives on tPA
- Goal:
  - *Increase awareness and education*
  - *Collect specific data (VSCC data)*
  - *Create Initiatives and Stroke Strategies to improvement treatment time*
- Changed to Acute Stroke Treatment Strategies workgroup to include tPA and Thrombectomy.
- Representation from all over the state

ASTS Timeline of Events



Creation of Strategies

- Realistic
- Attainable for hospitals of all sizes, volume and certification level
- Supported by current data, best practices and literature review
- Reviewed several difference resources including AHA guidelines, Target Stroke, Virginia Department of Health, *Stroke* and more.

ASTS Strategies

- Defined Stroke Alert Process (All patients that present within 24 hours from LKW)
  - *EMS Pre -Hospital Notification*
  - *Transfer Directly to Computed Tomography or other Designated Stroke Assessment Area*
  - *Rapid Access and Administration of Thrombolytic*
  - *Triage/Algorithm for Large Vessel Occlusion Detection and Screening*
- Continuous Quality Improvement for Delivery of Stroke Care
  - *Prompt Data Feedback & Review of Key Performance Indicators*
  - *Multidisciplinary Collaboration for Process Improvement*

Next Steps

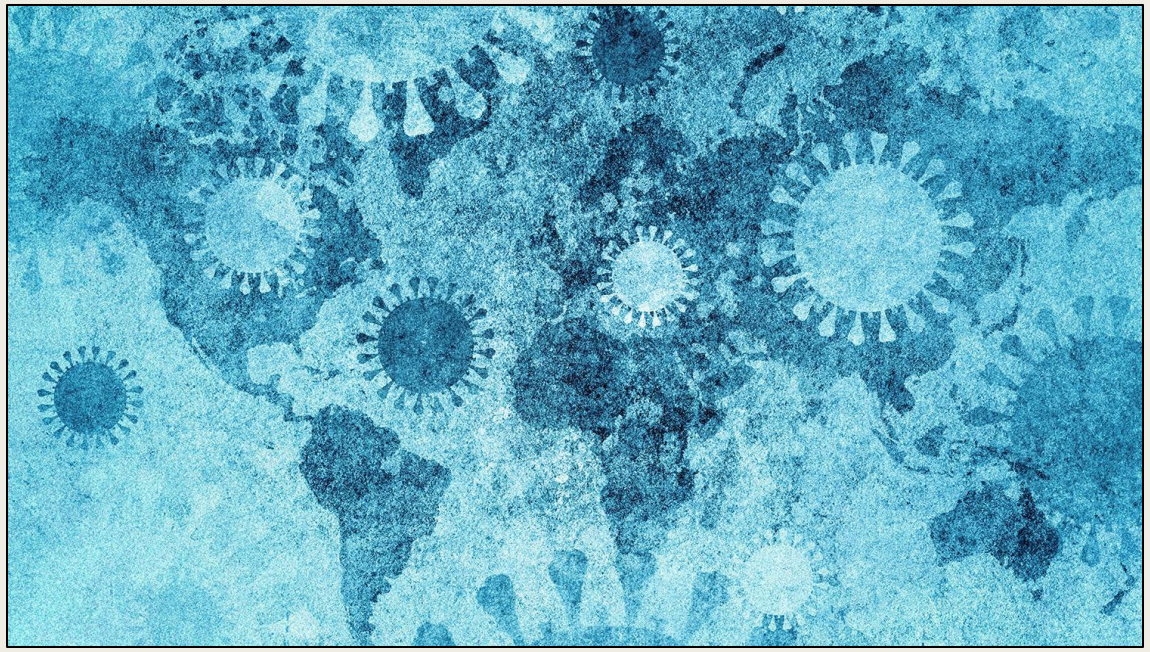
- ASTS QI Recommendations report prepared by workgroup
- Currently under review by the health commissioner' team
- Report scheduled to be submitted to the Virginia General Assembly July 1, 2020
- Workgroup to help hospitals implement strategies (based on need, hot spot etc).

COVID-19

Creating Challenges for Stroke Care

What is COVID-19?

- Virus (coronavirus) is SARS-CoV-2
- Clinical illness is called COVID-19
- Pathophysiology
  - *Hypoxemic respiratory failure*
  - *Cytokine storm*
  - *Disseminated intravascular coagulation*
- Global pandemic



COVID-19 and Stroke

- Ischemic stroke can occur in any patients under physiologic stress
- COVID-19 causes large number of ischemic strokes (even in young and otherwise mild disease)
- Increasing inflammation→worsen atherosclerosis
  - *Elevated CRP*
- Hypercoaguability
  - *Elevated d dimers*

JAMA Neurol. Published online July 2, 2020. doi:10.1001/jamaneurol.2020.2730

- ~2000 patients with ED visit or hospitalized for COVID-19, rate of ischemic stroke = 1.6%
- COVID-19 patients had 7.6 times greater ischemic stroke risk compared to influenza
- Patients tended to be older and had other stroke risk factors and more severe COVID-19 symptoms
- Few arrived at hospital with stroke, most strokes occurred after hospitalization.
- 32% vs 14% mortality

Management of acute ischemic stroke in patients with COVID-19 infection: Insights from an international panel

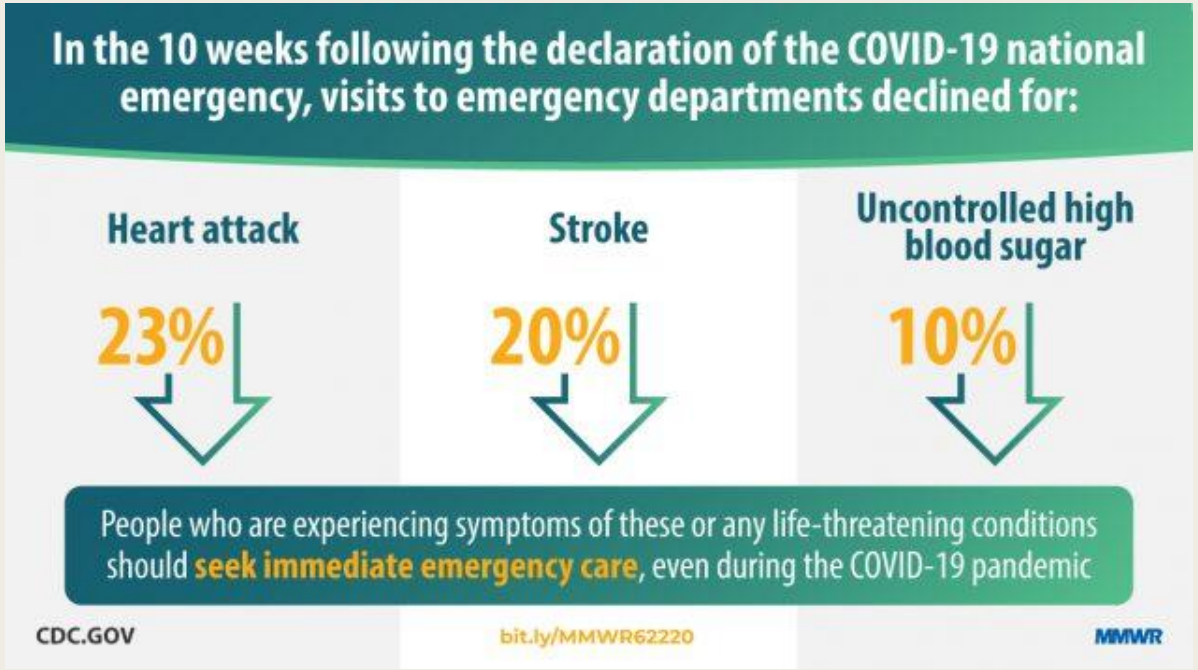
American Journal of Emergency Medicine 38 (2020) 1548.e5–1548.e7

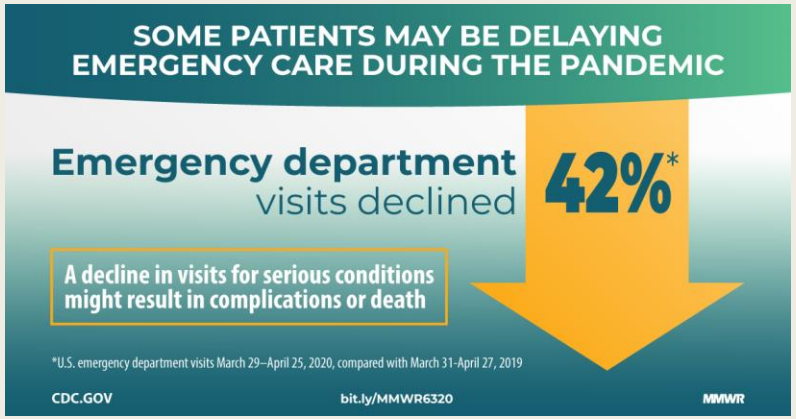
- 5% of COVID-19 hospitalized patients have a stroke
  - *Typical inpatient stroke rate is 0.06% of all hospitalized*
- 39% mortality from stroke and COVID-19
  - *Typical mortality from stroke is 5-10%*

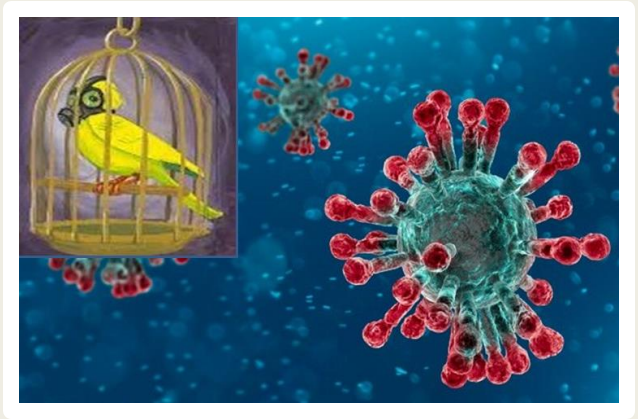
Potential Delays to Treatment

Less patients coming to ED, Fear of hospital, Ignoring minor strokes/TIAs

- *Strokes to VCU ED, Mar 20-Apr 20 → 61 (2019) vs 38 (2020)*
- *Strokes to RRMC ED, Mar 20-Apr 20 → 40 (2019) vs 48 (2020)*

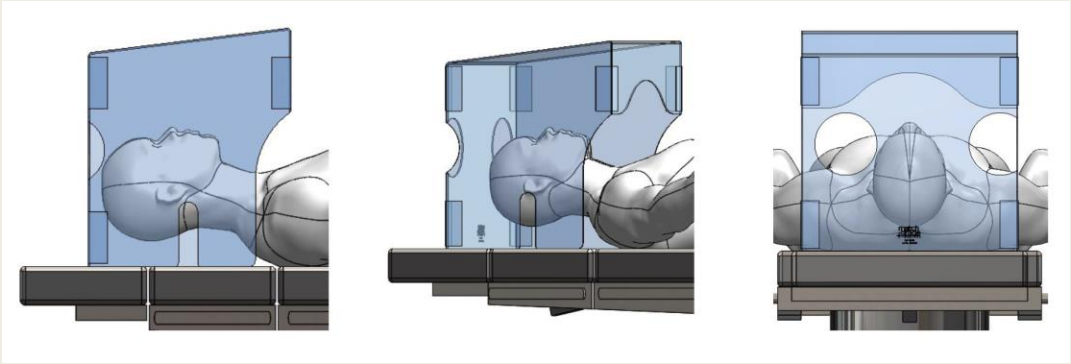






Potential Delays to Treatment

- PMH and Last Known Well (LKW) without family at the bedside.
- Needing EMS to provide family contact information.
- Initial screening questions
- Required PPE for potential COVID-19 patients
- Intubations requiring additional time for air exchange etc.
- Potentially not able to go directly to CT.
- Ever-changing department polices and procedures regarding COVID-19

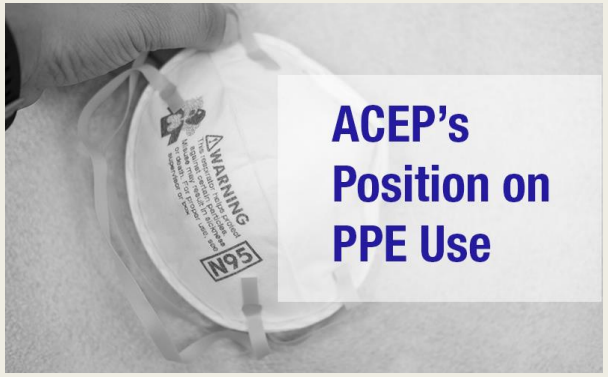


Get With The Guidelines (GWTG) Notice Regarding Delays

• **Stroke**	• Eligibility or Medical reason(s) documented as the cause for delay in thrombolytic administration
	  ○ Added Additional Selection***: Need for additional PPE for suspected/confirmed infectious disease.***
	• Cause for delay in performing mechanical endovascular reperfusion therapy documented
	  ○ Added Additional Selection: ***Need for additional PPE for suspected/confirmed infectious disease.***
		Of the patients entered in AHA's outcome-based registry, the addition of this reason for delay can be considered when evaluating timely administration of Thrombolytics or performing Mechanical Endovascular Intervention.

Provider Considerations

- Split care ED
- Structural and Process Changes to ED: Relocated Obs Unit, built walls/doors, redeployed staff/room monitors, FM clinic for low acuity, L&D PUIs to ED, teleconsults
- Initially, designated CT scanners
- No visitor policy—clarify PMH and LKW
- PPE usage/shortage
- Screening questions for triage/EMS/transfers
- Use of phones for patients to reduce exposures
- Limit team members in CT
- Staggered call schedules. Used telestroke capability to reduce stroke attending exposure



Provider Considerations

Acute Stroke Alert Process:
Emergency Department, Adult
Updated 4/28/20

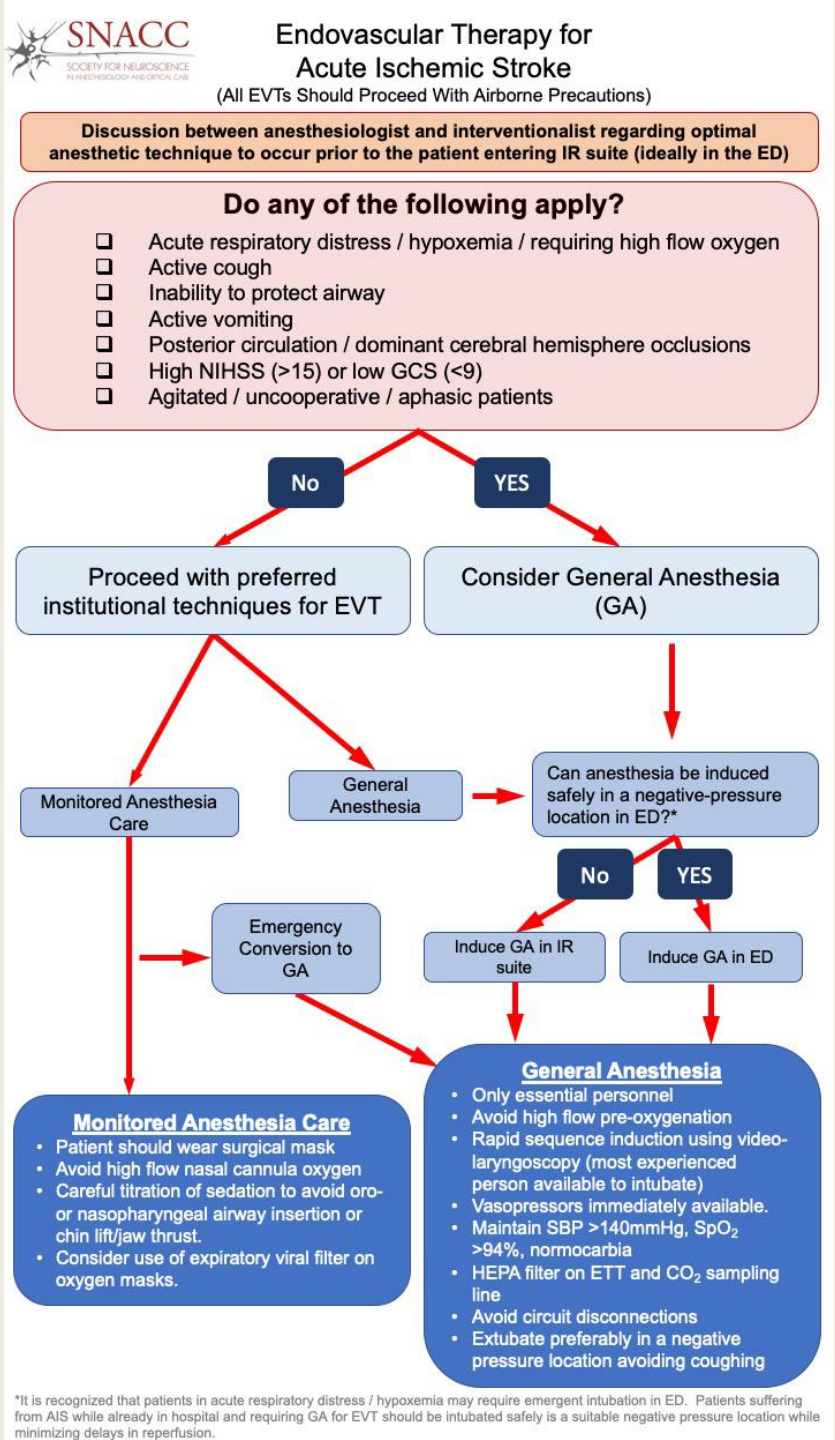
UPDATE: **COVID-19/PUI and non-COVID**

- CT scans completed and reviewed (**sequence depends on patient type**)
  - To review images with Radiology, call **628-1304** or **628-1305,** instead of personally going to ED Radiology Reading room

Pre-arrival

- If pre-hospital stroke alert criteria met, ED communications activates Stroke Alert (*500)
- Acute Stroke Team assembles to wait for patient arrival
  - Pre-brief with the ED physician regarding patient information, risk factors, and COVID-19 status (COVID-19 positive or Patient Under Investigation), including required level of PPE
  - Discuss imaging protocol (CT, pause, CTA/CTP versus CT/CTA/CTP)
  - ED physician will indicate the appropriate CT scanner location
  - Limit the amount of responding providers to only those necessary
  - PPE will be available for the limited bedside provider team only

- **COVID-19/PUI related cases**
  - Noncontrast Head CT, Head and Neck CTA/Head CTP obtained without interruption
  - Neurology reviews head CT while Head and Neck CTA/Head CTP are being completed. *These steps (HCT review and alteplase prep) are occurring simultaneously with CTA/CTP imaging to avoid delay in administering alteplase.*
    - For IV-alteplase eligible patients, Neurology instructs RN/PharmD to reconstitute altplase and reviews head CT with Radiology (call reading room)
    - Neurology orders alteplase
    - Immediately following completion of Head and Neck CTA/Head CTP scans, ED RN administers alteplase while pt on CT gurney



Decision to intubate MER candidates in the hybrid OR (Neurosurgery treats all as PUI)

PUI or COVID-19 (+) patients likely to tolerate EVT *without intubation*:

- Should *not* be intubated
- Droplet / contact precautions with masks on patient and staff
- N95 masks for staff immediately available for aerosolizing procedures
- Attach viral filters to suctioning equipment

PUI or COVID-19 (+) patients who *require intubation* for EVT:

- Intubate in a negative airflow room (prior to arrival in IR)
- Prioritize staff safety and first pass success
- Preserve cerebral perfusion pressure
- Use viral exhaust filters
- Avoid ventilator circuit disconnections

Note: Patients should be extubated in the ICU as soon as deemed safe to preserve resources

Nursing Considerations

- Quickly triage for COVID-19 AND life threatening diseases processes (STEMI, Stroke)
- Non Emergency Department staff now working at the bedside
- PPE considerations
- Slow down of actual care due to PPE
- Imaging considerations for potential COVID-19 patients
- Did not change frequency of assessments for post-alteplase patients
- Overwhelming education and process changes
- Fear of bringing home to family
- Many ER's separating patients by Non COVID/COVID areas

Quality Improvement Considerations

- Most quality improvement meetings halted
- Only virtual meetings allowed
- Quality RN's pulled to the bedside to cross train
- Data abstraction halted in some areas
- Hospital focus on budget
- Asked to start collecting additional data related to COVID-19
- Transitioned some jobs to remote
- Process improvement projects slow or halted

Patient/Family Considerations

- Alone during admission/ no visitors allowed
- Fearful of cross contamination
- Fearful of PPE
- Making difficult decisions with limited family involvement
- Resistance to rehab facilities with no visitors
- Lack of ongoing survivor/caregiver support groups
- Family having to make end of life decisions without being present

Overall Volume and Outreach

Stroke Volume

- Many hospitals saw a decrease in overall stroke volume.
- Patient's fear of going to the hospital.
- Community events and outreach halted.

Outreach

- Many hospitals utilized social media to provide out reach to the community.
- Reassurance that the Emergency Department was still a safe place.
- Education about the signs and symptoms of stroke.
- Facetime with family members at bedside.
- Virtual support groups.

Moving Forward

- Increased ED volumes
- Continue utilizing Tele Med/Tele Stroke
- Patient experience during COVID-19
- Find innovative ways to reach the community
- Process improvement around COVID-19
- Work through PPE supply/demand
- Keeping team members safe/wellness
- Move ahead with QI work previously placed on hold

Questions?

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