FOR DISCUSSION PURPOSES ONLY

DISCUSSION DOCUMENT: Direct Admission to an In-Patient Stroke Unit or other Inpatient bed

This discussion document is intended to support organizational planning during the unprecedented reality of COVID-19. In order to increase capacity in Level 2 or 3 beds, organizations may decide to bypass Level 2 or 3 beds for stroke survivors who have just received tPA, and instead admit directly to a Stroke Unit bed.

This pathway supports COVID admissions by increasing capacity in level 2 and 3 units (by decreasing tPA stroke admissions in these units) and ensures stroke survivors who receive tPA get the appropriate level of care in a safe environment.

Implementation Considerations: each organization will need to determine how, when and if this pathway supports their capacity requirements. Organizations may choose to implement this pathway immediately to support staff training and process development or implement at a future date as required.

Possible Admission Pathways for Acute Stroke Patients receiving tPA:

1. ED to Stroke Unit bed
2. ED to Non Stroke Unit bed (i.e. if COVID-19 suspected or positive, cohorted with COVID patients)

These paths involve:

- Bypassing a level 2 or 3 bed
- Care may be provided by staff with limited experience monitoring patients post tPA
- Within Non Stroke Unit beds, care may be provided by staff with limited stroke expertise

Note: Level 2 units are capable of providing service to meet the needs of patients who require detailed observation or intervention, including support for a single failed organ system, short-term non-invasive ventilation or post-operative care. Level 3 units are capable of providing the highest level of service to meet the needs of patients who require advanced or prolonged respiratory support—including invasive ventilator support—or basic respiratory support together with the support of more than one organ systems provide a higher level of care through specialized nurses.

Recommendations

When possible,

- Assign stroke nurses with stroke expertise to the inpatient area where stroke patients are being admitted
- Have a practitioner with stroke expertise available to consult and support
- If direct cardiac monitoring is not available, utilize other solutions available in the setting such as telemetry (monitored in real time), Zoll, Crash Cart

Requirements

Staffing: Acute stroke patients will require increased staffing ratios as noted below.

Monitoring: Monitoring requirements vary depending on the treatment the patient receives.

- Acute stroke patients may receive IV tPA. Cardiac arrhythmias with tPA may include: Rapid Atrial Fibrillation and/or ST segment changes.
- Ideally the tPA infusion should finish in the ED before the patient is transferred to an inpatient bed. If transfer is required while the infusion is running the patient must be transported by a nurse who is trained to administer and monitor a tPA infusion and trained to monitor continuous ECG. The patient must be on a portable cardiac monitor during transport and ideally until infusion is completed.
- Frequency of vital sign monitoring will depend upon therapy received and will vary from every 15 minutes to every 4 hours for the first 48 hours at a minimum.

Training & Education: Nurses not familiar with caring for these stroke patients will need training and or resources to support them.

Nurses will require (top skills)

- Knowledge on how to administer tPA infusion and monitor clients during and post tPA administration including
  - the ability to identify and respond to angioedema
  - monitoring for bleeding, especially at puncture sites, and directive to stop tPA infusion for severe bleeding
  - Avoid central line and foley catheter insertion and IM injections
- Ability to perform and document cardiac monitoring or ability to use Telemetry
- Ability to perform and document a detailed stroke assessment (NIHSS, CNS)
- Ability to identify and respond to changes in Level of Consciousness (LOC)
- Ability to locate resources and provide patient and family stroke education

Patients will require

- 1:1 nursing for first 24 hours post tPA
- 1:2 nursing next 24 - 48 hours post tPA
- 1:4 if no tPA administered
- Organization specific stroke specific charting for neuro assessment

Suggested resources may include:

- In house stroke experts (Clinical educators, stroke resource nurses, clinical leads on stroke unit, District Stroke Manager, tPA nurses etc.)
- Hospital drug administration resources (e.g. IV tPA admin guidelines)
- Hospital monitoring guidelines/ minimum standard policies
- Stroke Care order sets
- Stroke pathways
- Canadian Stroke Best Practice Recommendations for Acute Stroke Management

Suggested training may include:

- NIHSS assessment (online) - link
- Acute Stroke Unit Orientation Manual (online) link
- Supported Conversations for Persons with Aphasia (online + local trainers) link
- Local hospital educational resources

Special notes:

Stroke patients admitted to COVID-19 units will require the same considerations as the patient group above.

It is strongly recommended that EVT patients are cared for on the Stroke Unit for the first 24 hours as a minimum. They should be monitored as per hospital EVT monitoring guidelines.

Appendix A: Specific Information for Nurses on Level 1 units

Monitoring suggestions

no tPA given, no EVT	tPA given
Vital signs q4h x 48h Systolic BP target < 220 mmHg Diastolic BP target < 120 mmHg Neuro assessment q4h x 48h Telemetry	HR and BP q15min x2h then q30min x 6h then q1h x 16h Neuro assessment q1h x 24h Telemetry

tPA Information

Alteplase/tPA (tissue plasminogen activator) is a thrombolytic, or "clot buster" drug that is given to acute stroke patients who meet strict criteria for this medication. It is given to improve neurological recovery and reduce incidence of disability. tPA is given as an IV bolus followed by an infusion lasting 60 minutes through a dedicated IV line.

Monitoring Requirements:

- tPA infusion requires ECG monitoring; this drug may only be given by RNs trained in and able to analyze ECG monitoring
- Nurses must be familiar with and trained in the physiological monitoring policy in your organization
- Heart rate and blood pressure should be monitored every 15 minutes during the infusion and for two hours after the start of the infusion, then every 30 minutes for 6 hours and hourly for 16 hours
- Neurological assessment (NSR, neurological signs routine) should be performed hourly for 24 hours

Adverse Effects of tPA

- CVS: hypotension, arrhythmias, pericardial hemorrhage
- CNS: intracranial hemorrhage, fever
- GI: nausea, vomiting, gingival hemorrhage
- Hematologic: bleeding (this is the most frequent adverse event)
- Respiratory: epistaxis
- Other: allergic-type reactions - anaphylaxis, laryngeal edema, rash, urticaria

- Note: risk of angioedema/laryngeal edema may be increased in patients on ACEI (angiotensin converting enzyme inhibitors); this may occur during and up to 2 hours after the tPA infusion

Regarding Bleeding:

If serious bleeding occurs, stop tPA infusion. Bleeding risk is particularly high in patients receiving other drugs that impact coagulation, such as low molecular weight heparins. The following measures should be taken to prevent serious bleeding events:

- Visual assessment for signs and symptoms of bleeding should be performed every hour for 2 hours, then every 6 hours during tPA infusion, especially at puncture sites
- Minimize arterial and venous punctures, especially noncompressible puncture
- Central venous cannulation should be avoided, but if access to the central circulation is required, consider using a percutaneous approach
- Avoid IM injections
- Avoid foley catheter insertion after tPA administration
- Maintain strict bed rest during infusion and for 24 hours after, with falls risk prevention strategies in place