https://www.strokenetworkseo.ca/

KHSC Experience: Change to TNK for Acute Ischemic Stroke

January 2023

OBJECTIVES

- Provide brief overview of planning for TNK instead of tPA
- Share clinical processes with TNK
- Review next steps

WHY NOW?
TNK INSTEAD OF TPA

- Neurologists at KHSC inquired about what would it take to get TNK up and running?
  - Received heads up re acceptance of **AcT** RCT publication; TNK is non-inferior to tPA -- TNK is reasonable thrombolytic choice
  - Had +ve experience with use of TNK during AcT RCT at KGH site
  - Already had some processes in place for use of TNK (e.g., physicians & nurses had received education about TNK)

PLANNING FOR TNK USE

Task	Details	Outcome
Engagement-Planning	Set joint meetings with Pharmacy Manager & ED Pharmacist, ED Manager & Clinical Learning Specialist (CLS), Stroke Physician, Stroke Network TNK on Agenda for June Regional Acute Stroke Protocol Committee meeting with Paramedic leads	2 collaborative meetings needed for planning (pre/post AcT trial Publication) Group agreed to proceed with planning; ED supportive (ease of administration) Initial discussion w Paramedic leads re transport of TNK patients from Belleville
Seek Approval	Medical Director & Pharmacy lead to take off-label use of TNK to P&T Committee & Regional Director & Medical Director to prepare Briefing Note for Risk Management once AcT publication is out	Confirmed from pharmacy lead that formal approval not needed from P&T given TNK on formulary (fyi only) Risk Briefing Note not needed
Inquire what hospitals were doing	Regional Director to ask CorHealth Ontario Hyperacute Steering Committee to discuss trial results & implications Find out & share what different Centres are doing	Use of TNK instead of tPA discussed at Hyperacute Steering & Implementation Committees w high level planning Received info from BC

PLANNING FOR TNK USE

Task	Details	Outcome
Determine what's needed for implementation (include next slide):		
TNK Stocking needs	Review usage of tPA over past few months Check areas that stock tPA for stroke Ensure main areas are stocked: ED, ICU, Race cart, CSU and Cath Lab tPA to not be restocked-replaced with TNK Keep 1 tPA vial in ED & extra vials in pharmacy if needed	Close to launch, anticipated not using up tPA- Quinte Health purchased Kingston's unused tPA Able to use up some AcT trial leftover TNK Cally met with Roche to ensure KGH will have stock (100/yr)
Retrieve materials from AcT Trial	Obtain dosing guideline Determine how fast to push TNK bolus	AcT dosing guideline modified Bolus over 5 seconds
Determine who does what	Neurologists to discuss details-who administers TNK Discuss details with ED Manager and CLSs re preparing and administering	Collaborative approach-whomever is comfortable/ free
Set Go-Live Date	Sept 1st based on a) readiness & b) time expected to use up tPA	Went live w TNK on Sept 1st

PLANNING FOR TNK USE

Task	Details	Outcome
Update Clinical Processes	ICU/ED pharmacist to add ischemic stroke to TNK in Parenteral Drug Therapy Manual Best practice coordinator & team to update hyperacute process documents such as: • Order Set • Care Guideline • KGH ASP, protected guide, nurse & physician checklists & IP ASP • Rationale Guidelines for thrombolysis +/- EVT	Shared drafts of updated documents for feedback All Clinical Processes updated and communicated
Communication	Engage team leaders to determine best way to communicate change. Note: education was not needed on how to administer TNK for AIS with ED nurses Work with team leaders on developing communication messages (emphasized dosage) Informed external stakeholders (paramedics & QH-Belleville & other Stroke Unit hospital)	Brief Communiqués shared and posted ED, ICU, Race, and Cardiac Unit Professional Practice Exchange Blurb CLSs further communicated with teams (e.g., one requested BP coordinator provide presentation w ASP refresh) Email exchanges –e.g., with QH, message was we'd support them when ready

Acute Stroke Protocol Update for ED

TNK Instead of tPA for Patients with Ischemic Stroke at KHSC-KGH Site

Rationale for use of TNK with Ischemic Stroke

The use of recombinant tissue plasminogen activator (tPA) has been the standard thrombolytic therapy for ischemic stroke for many years. The AcT randomized controlled trial (Menon et al., June, 2022) combined with evidence to date, demonstrate that tenecteplase (TNK) is a reasonable choice of thrombolytic therapy for ischemic stroke. The use of IV thrombolysis, when administered within four and a half hours of onset of an acute ischemic stroke, has been shown to reduce morbidity, mortality and improve functional outcome.

On behalf of the Stroke team, a big Thank You to all the ED team for participating in the AcT clinical trial about TNK versus tPA!! (click here for the summary of the publication)

What Does this Mean to Me?

TNK will be easier to prepare and administer. Only a bolus is needed. You no longer need to prepare an infusion as you do for tPA. Many of you are already familiar with preparing and administering TNK for ischemic stroke as per the AcT trial. The Acute Stroke Protocol (ASP) packages and the ASP Checklist for Nurses located on the Stroke Cart are being updated and will include everything you need to know about TNK. The new TNK dosage guide (see below) for ischemic stroke will also be included in the Acute Stroke Protocol packages and posted in the CT suite.

The stroke physician and the ED nurse will work together to prepare & administer TNK; whomever is free and is comfortable can help with this task.

Reminders:

- Obtain TNK and stroke medication kit from Omnicell prior to transporting patient to CT
- Monitoring and care of the patient pre and post TNK administration is exactly the same as tPA
- If TNK is NOT given, return the vial to the ED Omnicell

Evidence indicates that **time is brain** - administration of IV thrombolysis as early as possible post stroke is associated with better outcomes.

Start Date: September 1st

TNK will be available in the ED Omnicell at this time.

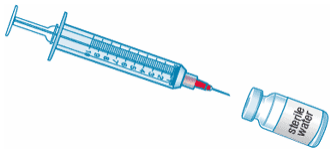
Any questions?

Contact Emily Murphy, Dr. Al Jin, or Colleen Murphy (ext. 6306 or Colleen.Murphy@kingstonhsc.ca)
For pharmacy-related question, you can contact Heather Wise or Michelle Methot

TNK Dosing Guide on Page 2- see slide 13

MAIN COMMUNICATION POINTS

- TNK is easier to prepare & administer. Only a bolus is needed; No longer need to prepare an infusion as you do for tPA
- Acute Stroke Protocol (ASP) packages updated & include everything you need to know about TNK
- Stroke physician & ED or RACE nurse work together to prepare & administer TNK
- TNK dosage for a patient with acute ischemic stroke is lower than that for patient with MI
- Monitoring & care pre/post TNK administration is exactly the same as tPA



Reminder-Time is Brain


TNK

01/09/2022

Acute Stroke Protocol of Southeastern Ontario

KGH Emergency Guide for Thrombolytic Therapy (IV Thrombolysis) and/or Endovascular Thrombectomy (EVT)

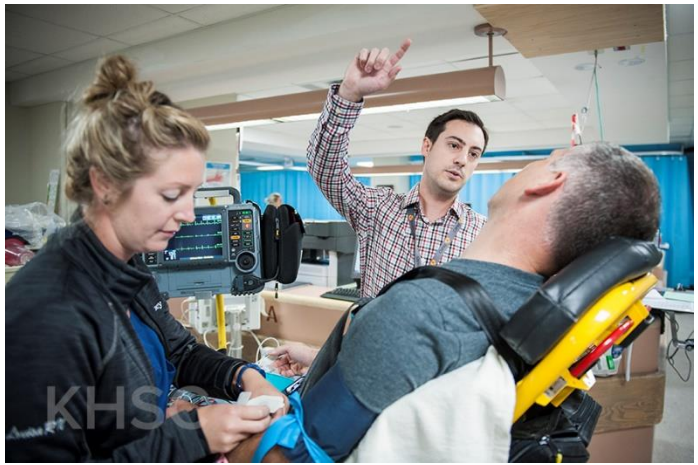
Inclusion Criteria for TNK or rt-PA	Exclusion Criteria for TNK or rt-PA
1. Patient suspected of having ischemic stroke 2. Deficit should be of a severity that would lead to significant compromise in patient's quality of life 3. Deficit should be relatively stable during period of observation 4. Clear and credible time of stroke onset can be established, and patient can receive IV thrombolysis within 4.5 hours. Time of onset is time patient was last seen well 5. Pregnancy is **NOT** a contraindication 6. Age <18 years is **NOT** a contraindication **If a child presents with stroke symptoms, Neurology-Stroke Service + Paediatric Intensive Care Service to jointly decide on next steps (e.g., consider contacting The Hospital for Sick Children in Toronto)**	1. Major surgery during previous 2 weeks 2. Major cerebral infarct or head/spinal injury in past 3 months 3. A known source of recent bleeding 4. Puncture of non-compressible artery or biopsy site within 7 days, including lumbar puncture 5. Blood pressure remains at systolic > 185 and/or diastolic > 110 despite treatment 6. Serious co-morbidity (e.g., advanced cancer, renal failure, hepatic failure) that would increase bleeding risk or limit effectiveness of treatment 7. Coma during current event 8. •INR > 1.7; •Increased PTT; •Platelet Count < 100,000; or •Direct Oral Anticoagulants taken within 24 hours *Caution if Warfarin taken within 48 hours 9. Blood glucose <2.7 or >22.2 mmol/L 10. Rapidly resolving neurologic signs
Inclusion Criteria for EVT	**Exclusion Criteria for EVT**
1. Presenting < 6 hours from stroke onset ▪ Highly selected patients presenting between 6-24 hours based on clinical & imaging criteria 2. NIH Stroke Scale (NIHSS) greater than 5 3. Pre-stroke functioning independently in activities of daily living in their community 4. Age 18 yrs or greater (if < 18 yrs see #6 above)	1. Complete resolution of neurological signs (TIA) 2. Serious co-morbidity with limited lifespan (e.g., advanced cancer, advanced dementia) 3. Recent Intracranial bleed 4. Severe contrast allergy or absolute contraindication to Iodinated Contrast 5. Difficult femoral, radial or brachial artery access 6. Fibromuscular Dysplasia (relative contraindication)

Thrombolytic Therapy and/or EVT Checklist (See Inside Acute Stroke Protocol Package for more Details)

- ☐ Draw bloodwork: CBC, PT, PTT, INR, electrolytes, BUN, Creatinine, Glucose, Troponin, Type and Hold 2 units, and βHCG (pregnancy test) if indicated
- ☐ Establish 2 IVs. Secondary IV should be started with 18-gauge needle in right antecubital fossa unless contraindicated
- ☐ Establish continuous ECG and O2 saturation monitoring
- ☐ Transport to CT Suite for non-contrast head CT + CT Angiography (CTA) + RAPID CT Perfusion (CTP); Take stretcher, monitor, transport kit, TNK or rt-PA, & stroke medication kit to CT. If directed to take rt-PA, bring IV pump
- ☐ Neurologist obtains consent from patient, or where necessary an appropriate family member
- ☐ Consider urinary foley catheter **only if** known that patient is candidate for EVT after CTA/CTP is done
- ☐ Determine patient's weight for TNK or rt-PA
- ☐ Treat Blood Pressure systolic > 185 and/or diastolic > 110 with IV Labetolol or IV Hydralazine as per Appendix A of Guidelines for the Use of IV Thrombolysis /EVT in Acute Stroke Protocol package
- ☐ See inside Acute Stroke Protocol package for IV TNK or rt-PA administration guideline
- ☐ Monitor CNS and blood pressure q 15min during & post IV thrombolysis /EVT for 2 hours
- ☐ Monitor for Angioedema and treat as per Appendix C of Guidelines for the Use of IV thrombolysis/EVT
- ☐ Keep patient NPO

INITIAL KGH ED EVALUATION

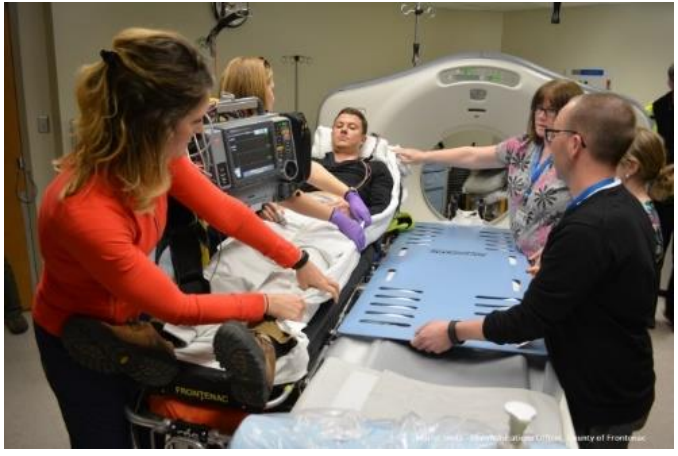
- Rapid ABC assessment
- Neuro examine using NIHSS
- Cardiac monitor (stays on paramedic stretcher), vitals
- IVs
- Acute Blood work (ASP package): Electrolytes, glucose, CBC, INR, PTT, creat, troponin



- ED nurse assembles equipment, TNK & meds
- **CT scan ASAP (within 10 minutes)**
- NPO until Swallowing Screen

Neurovascular Imaging

- All patients with suspected acute stroke undergoes immediate non-contrast brain CT, and vascular imaging with CTA +/- CT Perfusion with RAPID
- NEW: After non-contrast CT→ **STOP** imaging, administer TNK, then resume imaging



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Tenecteplase (TNK) Dosing, Reconstitution and Administration Guide for Acute Ischemic Stroke

Reconstitution Procedure:

1. Using a blunt fill needle, draw up 10 mL of Sterile Water for Injection into the TNK vial.
2. Inject all 10 mL into the 50 mg TNK vial directing the water into the powder. Slight foaming is not unusual; any large bubbles will dissipate if the product is allowed to stand undisturbed.
3. GENTLY swirl until contents are completely dissolved. DO NOT SHAKE. Solution should be colourless or pale yellow and transparent.

Dosing Information:

Intravenous tenecteplase (TNK; 0.25 mg/kg, maximum 25 mg) Dosing Information (50 mg Vial diluted with 10 mL Sterile Water)			
Patient Weight (kg)	Patient Weight (lbs)	TNK dose (mg)	Volume TNK to be administered (mL)
Less than 60	Less than 132	15	3
60 to less than 70	132 to less than 154	17.5	3.5
70 to less than 80	154 to less than 176	20	4
80 to less than 90	176 to less than 198	22.5	4.5
90 or more	198 or more	25	5

Administration Procedure:

1. Withdraw the appropriate dosage as per Dosing Table above.
2. Administer TNK as IV direct over 5 seconds.
3. Discard syringe with needle & remaining TNK in vial.

Posted in CT Suite and located in ASP Packages (Stroke Cart in ED and Race Cart)

NEXT STEPS

Task	Details	Outcome
Evaluation	Check in with teams for feedback	Was easy to implement-not a “big deal”; were already familiar with TNK during the AcT trial so were comfortable; change was fairly seamless Easier and more efficient No concerns; Going OK Process seems to be going well in ED & CT Suite & w RACE
	Examine pre/post TNK data (e.g., % of patients receiving IV thrombolysis, DTNs)	Administered 32 TNK doses in 1st 3 mos Changed process-easier to administer bolus post plain CT Will be pulling CIHI data when available-have the pre data
RE-engage discussions with paramedics & QH	Initial discussions indicated qualified paramedics can transport patients-issue was with the infusion for tPA	More discussions needed to ensure safe escort post TNK-looking to the province (concern is that not all are advanced care paramedics)
Consider change in process	Inquire whether still need two IVs given patients no longer have infusion; consider 1 IV & 1 saline lock/ consider need for IV fluids/ what is needed if become unstable?	Need to follow up with critical care and ED nurses

THANK YOU!

ED RN ASP CHECKLIST:

- ☐ ASP activated through switchboard
- ☐ Registration notified
- ☐ Prepare equipment:
  - IV access/blood draw supplies
  - Transport Monitor
  - Stretcher to follow patient to CT
  - ASP package
- ☐ Patient arrival:
  - Patient registered
  - CT notified of arrival (ask unit clerk to call)
  - Ambulance triage
  - IV access/blood work if needed
  - Obtain TNK from Omnicell
  - Stretcher, monitor, , transport kit/bag, and stroke medication kit & TNK from Omnicell is taken to CT department
- ☐ At CT:
  - ED stretcher ready outside of CT suite
  - ED monitor applied before scan
  - Remove jewellery and dentures
  - 2nd IV insertion if needed
  - +/-TNK administered & documented
  - Foley catheter inserted (or in ER if afterhours EVT case)
  - Stay on portable monitor
  - Triage note completed

FOR EVT PATIENTS ONLY!

- ☐ If Patient Returning to ER:
  - Usual care of patient +/- tPA
  - Return TNK to Omnicell if unused
  - Change patient into gown
  - Baseline nursing assessment
  - Patient NPO until STAND