GBMC Primary Stroke Center Provider Yearly Competency

Objectives

1

Learn about Primary Stroke Centers, Core metrics & provider responsibilities

2

Be familiar with the GBMC Acute Stroke Alert process, necessary imaging orders & time metric goals

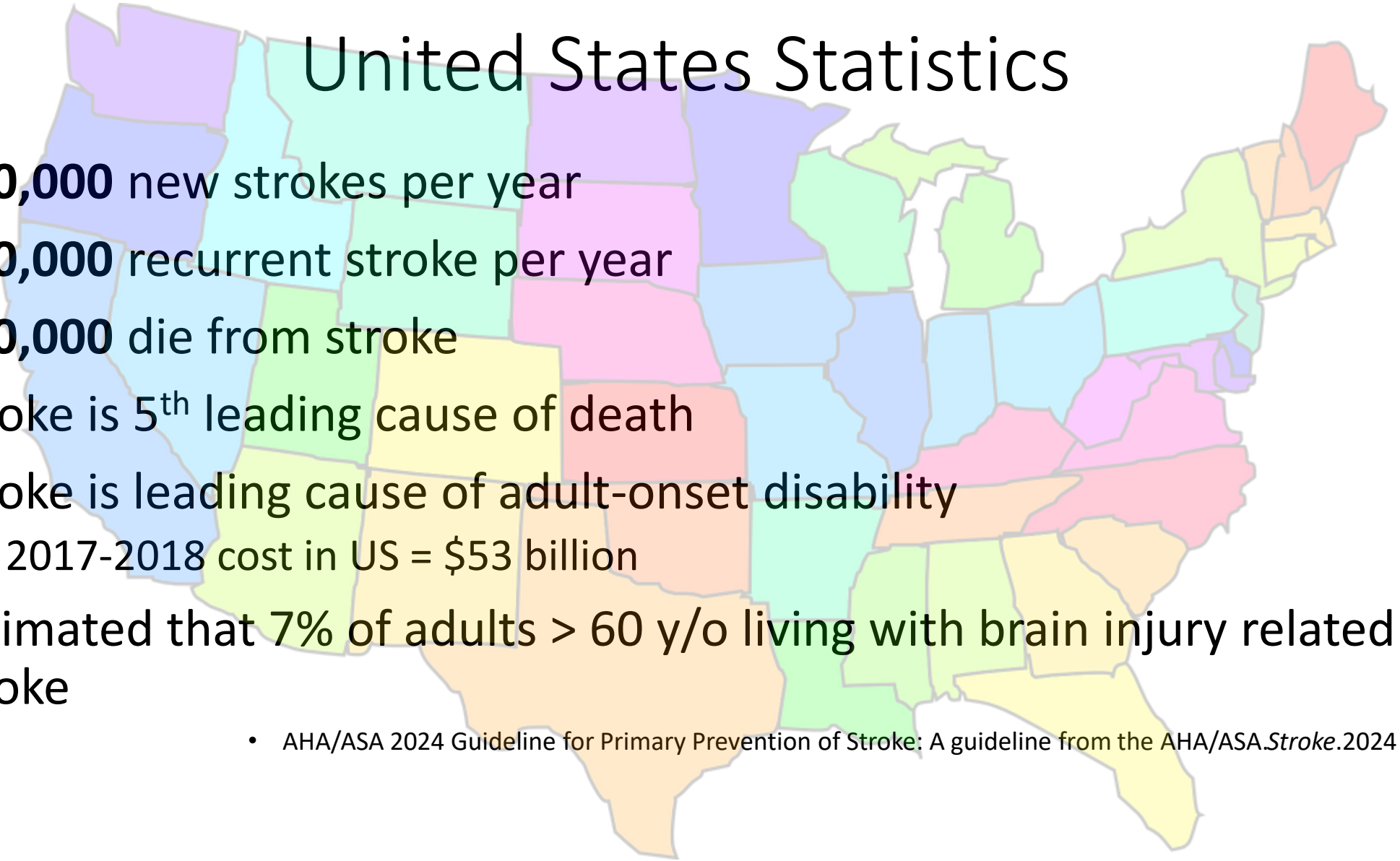
3

Be able perform appropriate stroke work up & individualized patient care based on risk factors

Overview of a Primary Stroke Center

Definition, Regulations and Core Measures

United States Statistics



- **600,000** new strokes per year
- **200,000** recurrent stroke per year
- **160,000** die from stroke
- Stroke is 5th leading cause of death
- Stroke is leading cause of adult-onset disability
  - 2017-2018 cost in US = $53 billion
- Estimated that 7% of adults > 60 y/o living with brain injury related to stroke

- AHA/ASA 2024 Guideline for Primary Prevention of Stroke: A guideline from the AHA/ASA.*Stroke*.2024

GBMC is a Primary Stroke Center

- Primary Stroke Center: a hospital that meets the standards to support better outcomes for stroke care.
  - **Primary Stroke Centers have:**
    - A dedicated stroke program
    - Qualified medical professionals trained in stroke
    - Deliver individualized patient care
    - Collect stroke treatment data to assess performance & guide quality of care
  - **Primary Stroke Center:**
    - Capable of giving thrombolytic within the 0-4.5-hour time window
    - Cannot perform thrombectomy, Patient will require transfer to thrombectomy capable centers

GBMC Primary Stroke Center

Stroke care is based on clinical practice guidelines

Core Measures are followed- national standards of care & treatment processes that are proven to reduce complications & lead to better patient outcomes

Stroke centers maintain the standards for care for stroke

- In Maryland, Stroke Centers are regulated by:
  - The Joint Commission (TJC)
  - Maryland Institute for Emergency Medical Services Systems (MIEMSS)

It is Important to be familiar with TJC Stroke Core Measures for our Stroke Program.

STK-1 -> DVT (VTE) prophylaxis for ischemic or hemorrhagic stroke patients given the day or day after hospital admission or documentation why not given.

STK-2 -> Ischemic stroke patients prescribed antithrombotic therapy at discharge

STK-3 -> ischemic stroke patients with afib/flutter who are prescribed anticoagulation therapy at discharge

STK-4 -> ischemic stroke patients who arrive within 2 hours of LKW for whom tPA/TNK was initiated within 3 hours of LKW

Stroke Core Measures

- STK-5 -> ischemic stroke patients administered antithrombotic therapy by the end of hospital day 2
- STK-6 -> Ischemic stroke patients prescribed a statin at discharge
- STK-8 -> ischemic or hemorrhagic stroke patients or their caregivers who were given educational materials during hospital stay addressing:
  - Activation of EMS
  - Need to follow up after discharge
  - Medications prescribed at discharge
  - Risk factors for stroke
  - Warning signs and symptoms of stroke

Stroke Core Measures

- STK-10 -> ischemic or hemorrhagic stroke patients assessed for rehab
- CSTK-01 -> ischemic stroke patients for whom an initial NIHSS is documented prior to TNK or within 12 hours of arrival

Types of strokes seen at GBMC Primary Stroke Center

Ischemic stroke-> acute focal neurological deficits attributable to lack of blood flow in a cerebral vessel

Hemorrhagic stroke (ICH)-> Neurological symptoms due to acute blood extravasation into the brain parenchyma from a ruptured cerebral blood vessel

Subarachnoid hemorrhage(SAH)-> Neurological symptoms due to acute blood extravasation into the subarachnoid space due to ruptured cerebral blood vessel

Transient Ischemic Attack (TIA)-> acute focal deficits that resolve within 24 hours, have negative brain MRI and are attributable to lack of blood flow in a cerebral vessel

Transient Ischemic Attack

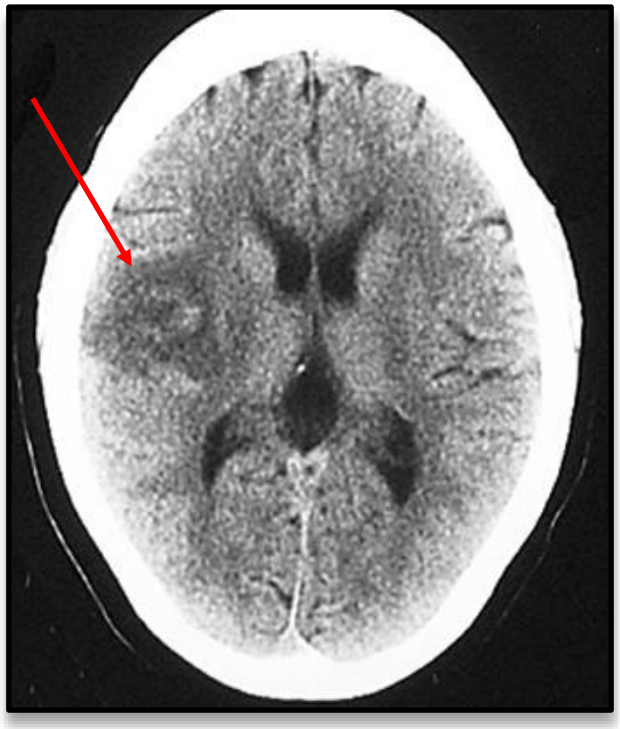
At GBMC all TIAs are managed the same as ischemic strokes

TIAs are not:

- Encephalopathy
- Syncope
- Pre-syncope
- Seizure
- Orthostatic lightheadedness

Hemorrhagic Stroke or also called Spontaneous Intracerebral Hemorrhage

Ischemic Stroke



Aneurysmal Subarachnoid Hemorrhage

GBMC Demographic Data

- 57.3 % female
- 31 (9%) patients ages 18-65 (10%)
- 62.1 % come by private vehicle
- Stroke types:
  - 60.9% ischemic, 27.3% TIA (87%)
  - 5.7% hemorrhagic stroke (10%)
  - 0.5% subarachnoid hemorrhage (3%)
- 3 top stroke risk factors for our population
  - Hypertension
  - Dyslipidemia
  - Diabetes

GBMC has several Stroke Policies- It is important that all providers caring for stroke patients be familiar with our stroke policies.

Acute Stroke/TIA: Patient Management Protocol
Stroke Program Policy
Hemorrhagic Stroke (spontaneous intracerebral hemorrhage) Policy
Protocol: Management of symptomatic Intracranial hemorrhage within 24 hours of Tenecteplase administration
Management of Angioedema associated with Tenecteplase for AIS
Symptomatic Intracranial Aneurysm/Aneurysmal Subarachnoid Hemorrhage Policy

All policies are found on the GBMC infoweb

It is mandatory that all providers use stroke order sets for all stroke patients

- Stroke order sets are based on guidelines & follow processes outlined in GBMC stroke policies
- Stroke order sets have prechecked nursing requirements for vital signs and neuro exams for a stroke program
- Stroke order sets alert the Stroke Team that a new stroke was admitted
  - All stroke charts are reviewed for Core metrics or action items
  - All stroke charts need to be abstracted
- Stroke order sets currently available to providers include:
  - Adult Ischemic Stroke/TIA Admission
  - Intracerebral hemorrhage ICU Admission
  - ICU Ischemic Stroke Admission ->Post Tenecteplase
  - Inpatient Stroke Alert (convenience set)
  - Aneurysmal Subarachnoid Hemorrhage -> under development

Provider Education for Stroke is Mandatory at GBMC

- Any provider who takes care of stroke patients on inpatient or outpatient need to do the following education requirements:
  - Yearly competency through Workday
  - Yearly attestation:
    - for 4 CME /credit hours per year
    - NIHSS every two years
- Providers are responsible for keeping their education credits
- During stroke surveys providers will be expected to hand in stroke education credits & NIHSS certification certificates when requested

Provider Education Resources at GBMC

- Stroke Services site on GBMC Infoweb contains:
  - Stroke Guidelines
  - Links for NIHSS training
  - Links to Stroke Enduring materials for CME
- Grand Rounds once a year is focused on stroke -> Category 1 CME
- May Stroke Lecture Series
- Stroke Yearly Competency

Stroke Management

Stroke Alert at GBMC, Neuroimaging for Stroke, Stroke Work Up

Stroke Program Leadership (12/2024)

Stroke Alert- Time is Brain!

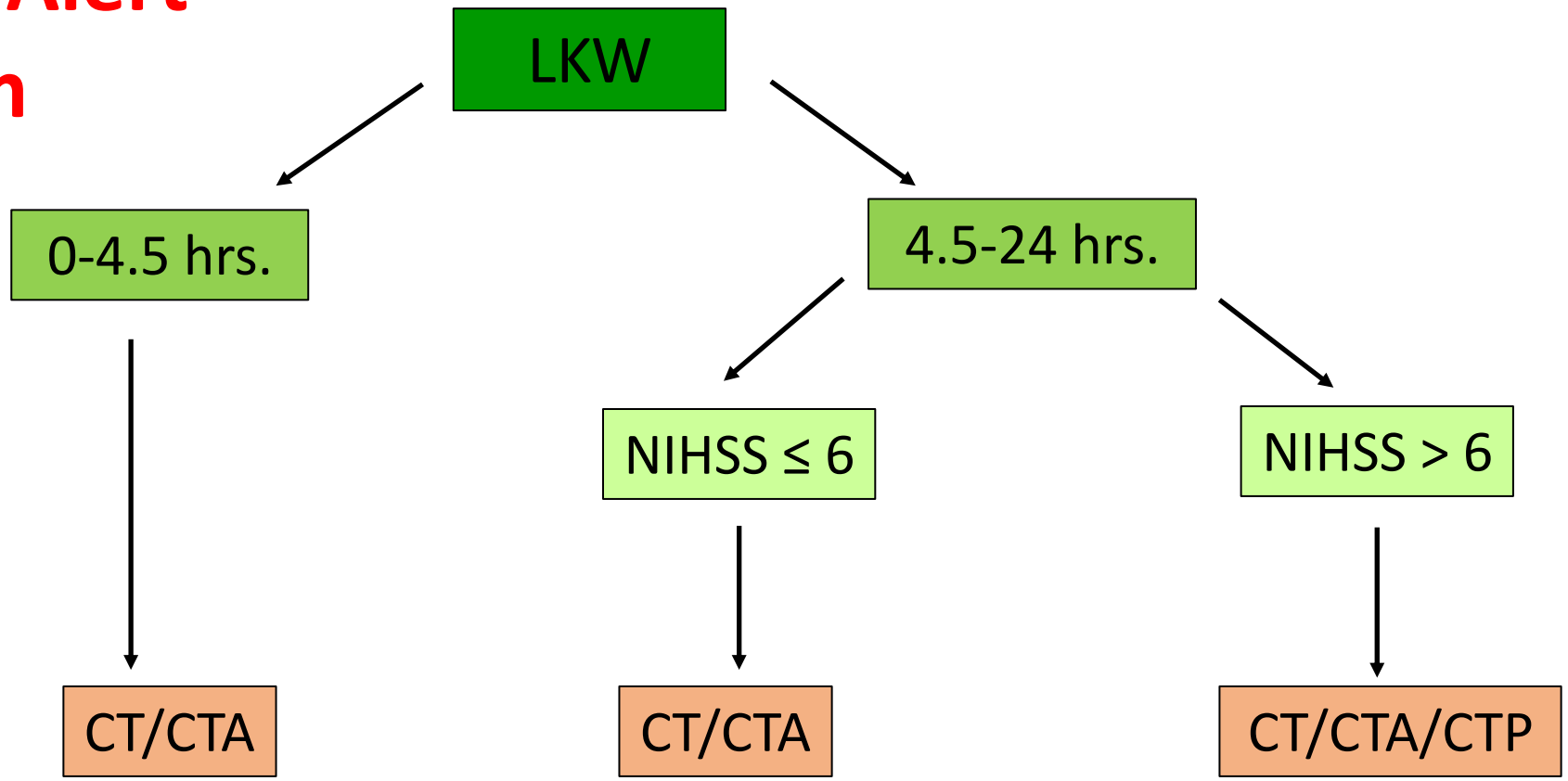
- A stroke is a vascular emergency & should be treated with the same urgency as a STEMI
- Acute Stroke Time window is 0-24 hours
- Goal in a Stroke Alert: to return cerebral blood flow to territory at risk ASAP
- Neuroimaging needs to be initiated within 20 minutes of Stroke Alert
- Stroke Alerts in the ED/outpatient are managed by the ED team
- Stroke Alerts on inpatient are managed by the Rapid Response Team
- For an inpatient Stroke Alert call 2777

Stroke = STEMI

Stroke Alert Check List- available in stroke packets on each floor

- ❑ Last known well
- ❑ Vitals
- ❑ Fingerstick
- ❑ IV (CTA 20g; CTP 18g)
- ❑ NIHSS-> complete on the move
- ❑ Place imaging orders using IPSA order set
- ❑ Review TNK inclusion/exclusion criteria
- ❑ Call JH Stroke Neurologist and provide short HPI and above data
- ❑ Verbal consent for TNK
- ❑ Order TNK
- ❑ Call ICU & transport patient to ICU
- ❑ If being transferred to JH, help facilitate transfer

GBMC Stroke Alert Algorithm



20 minutes

ED & Inpatient Stroke Alert Imaging Protocol

Acute Stroke Neuroimaging

Head CT w/o contrast: used to rule out blood for decision to treat with thrombolytics

If no blood & within the time window patient would be TNK candidate

CT Angiography (CTA) brain & neck with contrast: to rule out large vessel occlusion (LVO)

If LVO present, patient could receive TNK & also be a thrombectomy candidate

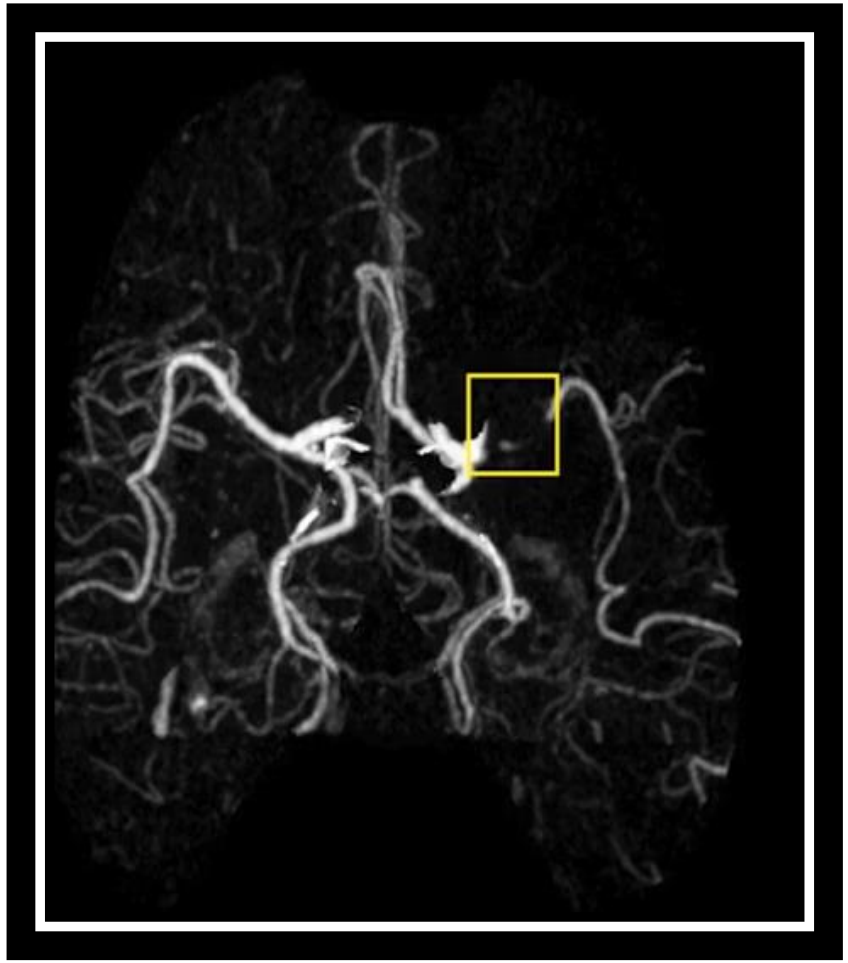
Patient would be transferred to Comprehensive stroke center

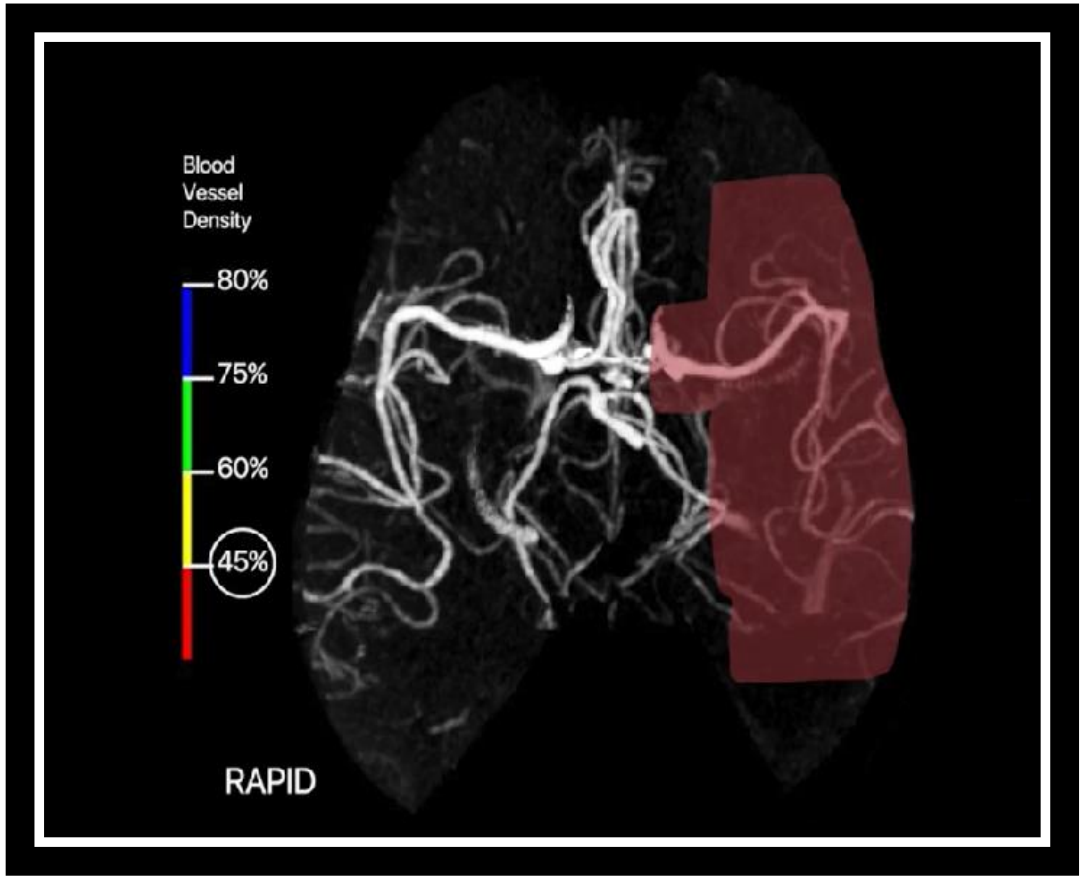
Goal door in/door out time for thrombectomy is 90 minutes

CT Perfusion (CTP)-> helps define the core infarct from the penumbra (territory at risk). At GBMC we use RapidAI software.

Used to determine if patient is thrombectomy candidate by Stroke Neurologist

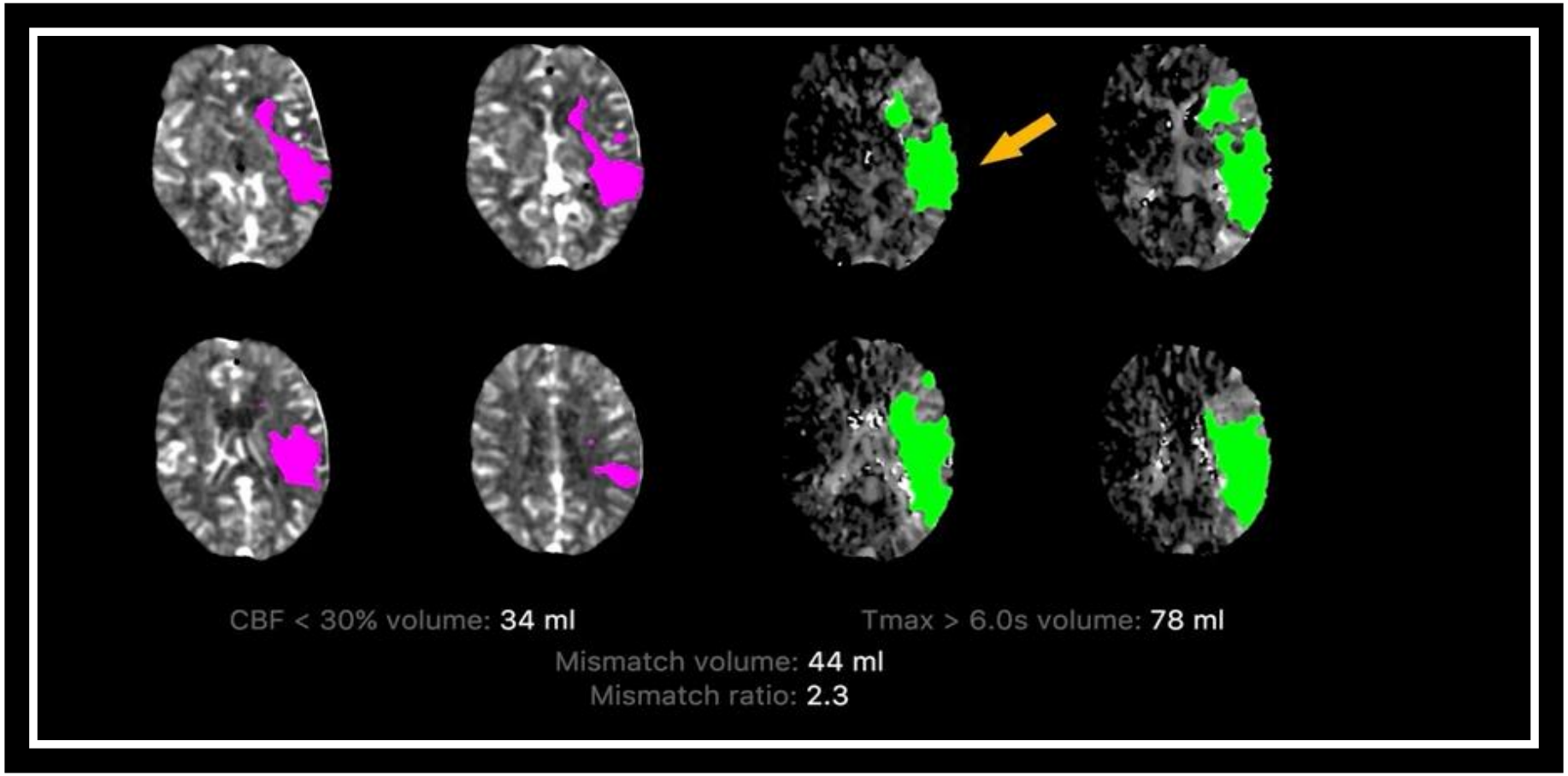
RapidAI- CTA shows occlusion & provides a map of blood vessel density. Red means significant decrease blood vessel density in this example





u.rapidai.com

RapidAI uses several calculations to estimate irreversibly damaged tissue (purple) vs. tissue with low perfusion (green) which may be potentially salvageable.



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GBMC uses Tenecteplase (TNK)

Inclusion/Exclusion criteria are the same as for alteplase (tPA)

Dose of TNK is 0.25mg/kg; max dose is 25 mg

TNK is reconstituted by the nurse & given at the bedside as IV push

Providers are responsible for understanding post TNK orders which include:

- DVT prophylaxis with pneumatic compression devices
- BP goals
- CT /MRI at 24 hours to rule out bleed before patient leaves ICU
- Nursing vital signs and neuro-checks are specified in the orders to meet guideline recommendations

Important Time Goals in a Stroke Alert

Door/activation to initiation of imaging 20 minutes

Door/activation to needle for TNK = 30 minutes

Door in/door out (transfer times) for thrombectomy = 90 minutes

Neurology Services for Stroke

All Stroke Alerts are covered by Johns Hopkins Stroke Neurologist

All routine stroke consults are completed by the GBMC Neurologist covering inpatient service

All Call schedules are available through Epic

On Call Finder

External Resources Infoweb On Call List

It is recommended that stroke patients have follow ups with Primary Care as well as with a Neurologist when discharged

Initial Stroke Work up to be completed within 48 hours of admission

Labs: CBC, PT, PTT, glucose, HgBA1c, creatinine, Lipid Profile with LDL

Brain Imaging:

- MRI brain without contrast recommended for all strokes unless contraindicated
- GBMC currently does not have pacer compatible MRI capability

Vascular imaging

- Most patients in ED will have CTA head and neck completed
- MRA, carotid ultrasound are alternatives in the non-acute setting

Cardiac testing

- EKG
- Echocardiogram with bubble study
- Telemetry

Neurology consult recommended at GBMC

Stroke Hospital Management

- Stroke patients at GBMC are admitted to designated stroke units
- Stroke patients are at high risk for dysphagia & possibly aspiration
- All stroke patients need to undergo the Yale Swallow Screen
- If a stroke patient fails the swallow screen then:
  - The patient is made NPO
  - It is imperative they receive **no medication** by mouth
    - *Remember aspirin can be given per rectum*
  - Any other essential medications such as antiepileptics or antihypertensives needs to be given IV
  - The patient needs to be cleared by a speech language pathologist before receiving PO

Stroke Hospital Management

- All patients should be evaluated for stroke risk factors to guide individualized management
  - Modifiable: hypertension, hyperlipidemia, atrial fibrillation, diabetes, tobacco use, obesity, carotid stenosis
  - Non-modifiable: family history, genetic clotting disorders when appropriate, congenital risks, race, sex
- Antiplatelet and statins are a mainstay of therapy and part of Core Metrics
- Anticoagulation for atrial fib/flutter recommended
- Education on exercise and healthy diet
- All patients need either pharmacological or mechanical DVT prophylaxis
- Patients require rehab assessments within 48 hours

Key Points

All providers working at a Primary Stroke Center are part of a team that promises to deliver stroke care based on current AHA/ASA guidelines and standards of care

All providers are expected to use Epic stroke order sets

All providers are expected to review GBMC stroke polices

All providers caring for stroke patients need to have yearly education & NIHSS certification every two years

At GBMC we see TIA, hemorrhagic strokes, ischemic strokes & subarachnoid hemorrhages all of which are part of our stroke metrics

Key Points

Stroke Alerts for acute stroke are within the 0–24-hour time window

Stroke Alert Imaging Algorithm is the same for inpatient, outpatient and ED

Providers are expected to know how to call a Stroke Alert

Acute stroke imaging includes CT w/o contrast, CTA and CTP following the algorithm

Inpatient management focuses on individualized care by reviewing stroke risks & applying a standard approach to care

References

- Guidelines for the Early Management of Patients with Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke. Stroke.2019 Dec;50 (12):e344-e418
- 2021 Guideline for the Prevention of Stroke in patients with Stroke and Transient Ischemic Attack. A Guideline from the American Heart Association/American Stroke Association. Stroke.2021: Jul; 52 (7): e383-e484
- 2022 Guideline for the Management of Patients with Spontaneous Intracerebral Hemorrhage: A Guideline from the American Heart Association/American Stroke Association. Greenberg et al. Stroke; 2022