Updates on Stroke and NorthShore Stroke Guidelines

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Role of the Acute Stroke Team

- Evaluates the patient for stroke
  - Ischemic or hemorrhagic
- Formulates a plan based on symptoms
- Is the patient a candidate for IV tPA and/or endovascular intervention?
- Collaborates with the healthcare team

Primary Stroke Centers

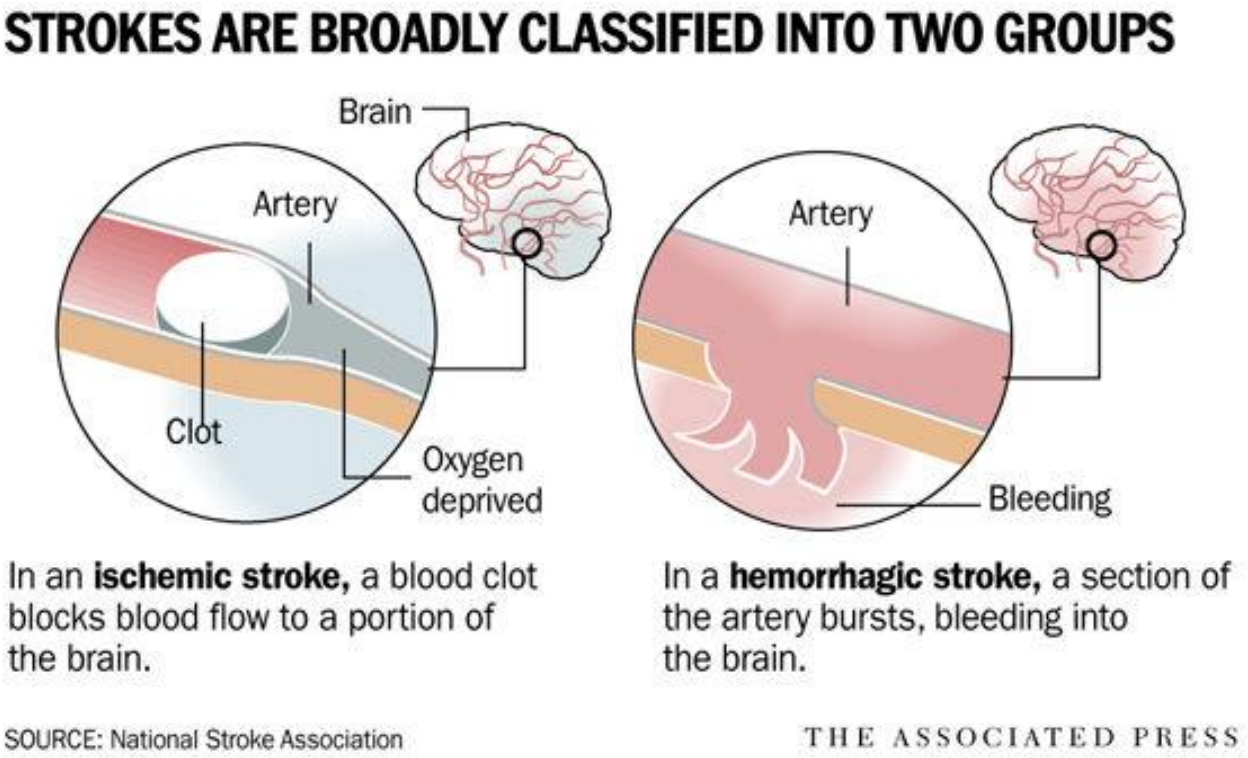
Primary Stroke Center

- “Resources, organization and expertise” available to treat acute stroke 24/7, 365 days/year
- Acute Stroke Team must be hospital based/telestroke
- Must be available to evaluate suspected stroke within 15 minutes
- Must be able to provide neuro-interventional services within 2 hours of consultation
- Defined by BAC, ASA, and Joint Commission

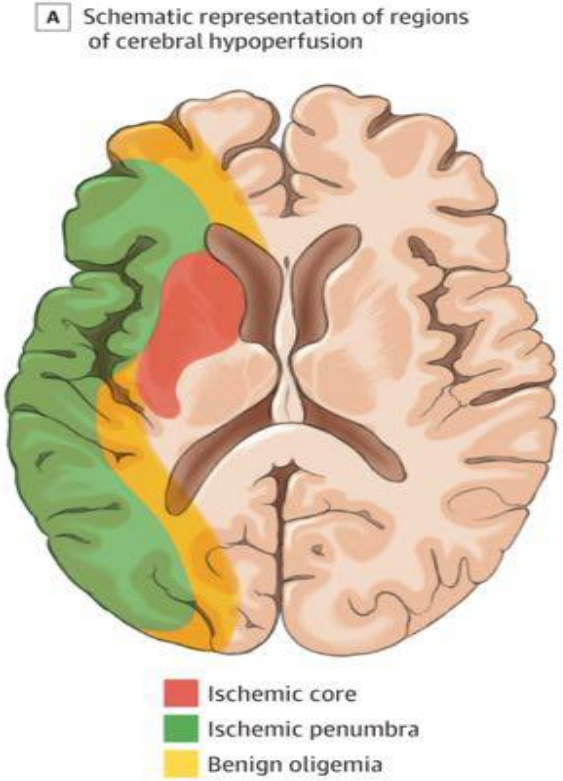
The Joint Commission Survey

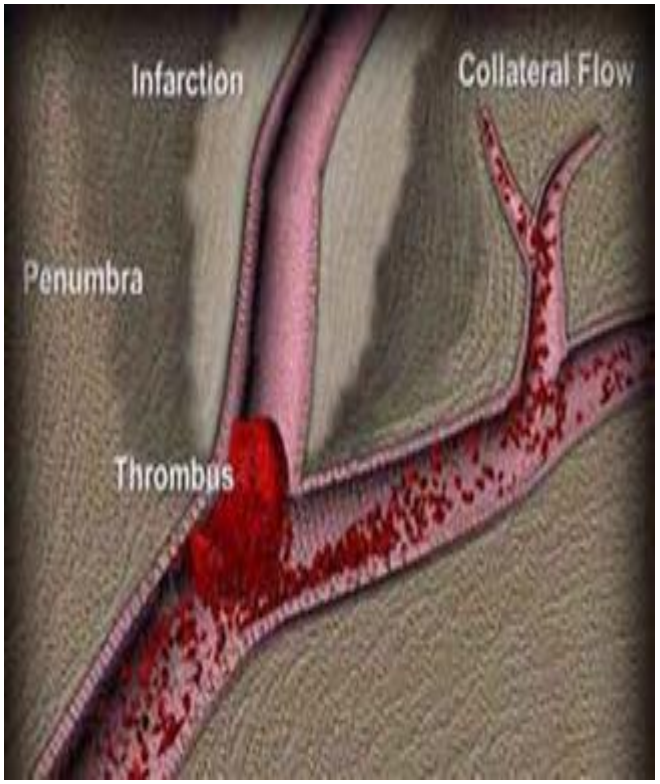
- March 8 – June 6, 2019
- 4 day visit
- Primary Stroke Certification (PSC)
  - Evanston Hospital
  - Highland Park Hospital
  - Glenbrook Hospital
  - Skokie Hospital

Brief Review of Stroke:



Large Vessel Occlusion

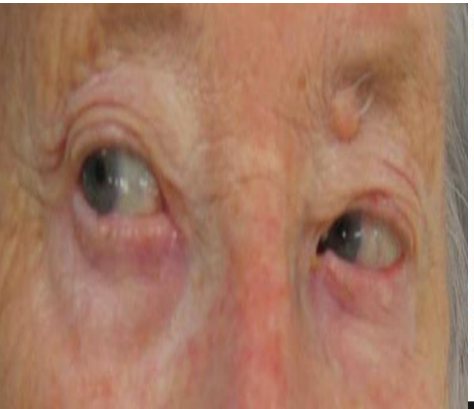




JAMA.2015,313(14):1451-1462.doi:1001/jama.2015.3058

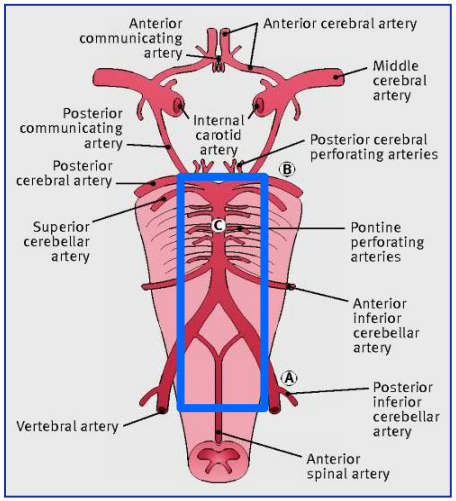
Recognizing LVO

- NIHSS ≥ 6
- G-FAST score:
  - Face asymmetry
  - Arm weakness (when held out for 10 seconds)
  - Speech difficulty (speech output and/or comprehension)
  - Time (get to the ED/ call 911)
  - \+ G – best gaze
  - Assess for gaze deviation
    - » One of the most sensitive clinical signs suggesting large vessel occlusion (LVO)
- High sensitivity for G-FAST score ≥ 3; other scoring systems similar sensitivities
- Other symptoms of LVO: neglect, hemianopsia



Posterior Circulation Stroke Symptoms

- Often missed or misdiagnosed, sometimes dismissed by patients
  - Vision loss (usually both eyes- hemianopia, quadrantanopia) “missing left side of the page”, “bumping into things on one side”
  - Ataxia
    - » limb ataxia
  - Gait ataxia
    - » veering or “being pulled” in one direction
- Brainstem symptoms, especially if multiple
  - Cranial nerve abnormalities
    - » typically unilateral
    - » diplopia
  - Eye movement abnormality
    - » distinguish from strabismus, etc.
  - Dysphagia/dysarthria
  - Crossed symptoms or exam findings
    - » e.g., LEFT face, RIGHT arm and leg numbness; RIGHT eye palsy, LEFT side weakness
  - Vertigo, especially with focal deficits



Goal Action Times
Thrombolytic Candidates

Time Interval	Time Target
Door to ED MD	≤10 minutes
Door to CT completion	≤25 minutes
Door to CT interpretation	≤45 minutes
Door to treatment	≤60 minutes
Door to monitored bed	≤3 hours

Acute Ischemic Stroke Therapies

- IV tPA
  - Standard of care in acute ischemic stroke
  - Up to 4.5 hours from Last Known Well (LKW)
  - Age ≥ 18 years, diagnosis of stroke with measurable deficit
  - Goal ED door to needle time <60 min (ideally <45 min)
  - tPA complications: bleeding, angioedema
- Endovascular intervention
  - For suspicion/ evidence of large vessel occlusion (LVO)
  - Mechanical thrombectomy, IA tPA, angioplasty, stenting
  - Up to 24 hrs from Last Known Well (LKW)
  - Age ≥ 18 years
  - Reasonably good functional baseline
  - Efficacy can be even greater than IV tPA alone

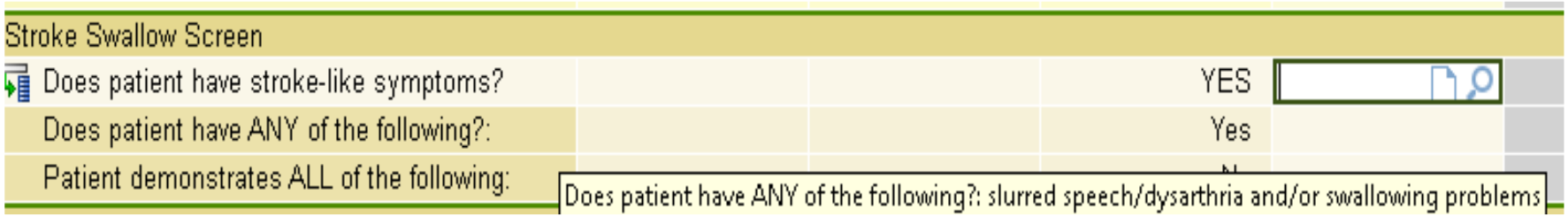
Performance Indicators

- Thrombolytic therapy (Ischemic)
- Antithrombotic therapy by the end of hospital day 2 (Ischemic)
- VTE prophylaxis (Ischemic and Hemorrhagic)
- Assessment for rehabilitation (Ischemic and Hemorrhagic)
- Stroke education (Ischemic and Hemorrhagic)
- Discharged on statins (Ischemic)
- Discharged on antithrombotic therapy (Ischemic)
- Discharged on anticoagulation for afib/a-flutter (Ischemic)
- NEW measures as of January 2019:
  - STK-OP-1: Door to transfer to another hospital
  - CSTK-01: NIHSS performed for ischemic stroke patients
    - NUHS guidelines: full NIHSS done in ED for all patients presenting with stroke symptoms

Stroke Swallow Screen

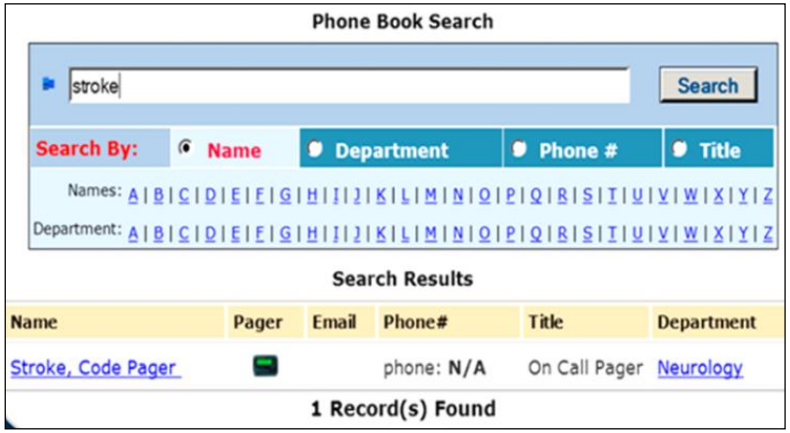
Only Validated for Stroke Patients

- RN responsibility
- The only 2 diet options for stroke or TIA patient prior to Speech Therapy evaluation are *NPO* and *NDD2/Mechanically altered/All Liquid*
  - If patient passes:
    - Notify physician for NDD2/mechanically altered/all liquid diet
    - Additional dietary restrictions per attending MD
    - RN must monitor first oral intake
  - If patient fails:
    - Keep NPO no exceptions including medications until seen by ST
    - ST to perform a bedside swallow evaluation
- All stroke patients need ST evaluation



Summary of Changes NUHS Stroke GPs

- Acute Stroke Team Guidelines (GP-51)
  - Time window expanded for intervention up to 24 hours
    - » Also reflected in Acute Ischemic Stroke Guidelines (GP-58) and
    - » Emergency Department Guidelines for Management of a Stroke Patient (GP-52)
  - If symptom onset < 6 hours, or within 6-24 hours of last known normal with LVO symptoms, complex stroke presentation or posterior circulation stroke (with symptom onset greater than 6 hours)
    - » Page 8080 with 10 digit call back number, hospital, room number, patient name and physician name



Summary of Changes NUHS Stroke GPs

- Emergency Department Guidelines for Management of a Stroke Patient (GP-52)
  - Clarification of communication process between Emergency Departments for patients undergoing endovascular intervention including potential hold in ED on “off hours”
  - Full NIHSS documentation for patients presenting with concern for stroke
- Criteria for IV-tPA (GP-54)
  - Eligibility for tPA, as well as contraindications per 2018 AHA/ASA guidelines for management of acute ischemic stroke
- Guidelines for Diagnostic Testing (GP-56)
  - Coagulation studies (PT/INR) for those patients on anticoagulation

Summary of Changes NUHS Stroke GPs

- Primary Non-Traumatic Intraparenchymal Hemorrhage Guidelines for Admission, Transfers, Attending Coverage, Monitoring, Performance Measures (GP-57)
  - ED MD to assess patient within 10 minutes of arrival
  - PT/PTT/INR to be drawn with initial labs
  - Post thrombolytic hemorrhage guidelines updated per AHA/ASA 2018 Guidelines for Management of Acute Ischemic Stroke
  - Terminology changed from Target Specific Oral Anticoagulants (TSOACs) to DOACs (Direct Oral Anticoagulants)
- Radiology Department Guidelines for Management of a Stroke Patient (GP-59)
  - CTA head and neck with contrast should be done STAT for all those patients to determine eligibility for endovascular intervention
- Stroke Swallow Screen (GP-60)
  - Change of terminology from Bedside Swallow Screen to Stroke Swallow Screen
  - Diet changed to NDD2/mechanically altered with all liquids

Summary of Changes NUHS Stroke GPs

- Intra-System Transfer of Patients with Intracranial Hemorrhage (GP-61)
  - Neurosurgery service responsible for entering note in EMR for all patients that are not transferred to Evanston that documents head scan image review, as well as reason for non-transfer
- Guideline for Telestroke (GP-62)
  - Clarified and updated process for managing technical difficulties with telestroke
- EMS IV Alteplase/tPA/IR Transfer Guideline (GP-63)
  - Identified expanded window for patient eligibility for intervention at Evanston, thus expanded window to call for critical care ambulance for standby as soon as stroke is identified
  - Clarification of communication process between Emergency Departments for patients undergoing endovascular intervention including potential hold in ED on “off hours”

New: Stroke GP 64

- **Guidelines for Management of tPA complications (GP-64)**
  - Post-thrombolytic hemorrhage
    - 10 units cryoprecipitate
      - If fibrinogen <200 mg/dl, administer additional dose
    - Tranexamic acid
    - Aminocaproic acid
    - Note: stroke neurologist responsible for placing the orders
  - Angioedema
    - Stop ACEIs
    - Methyprednisolone
    - Dyphenhydramine
    - Famotidine
    - Epinephrine
    - Plasma-derived C1 esterase inhibitor
  - New Stroke Order Set in EPIC PROD effective January 15, 2019

New: Stroke GP 65

- **In-House Stroke Algorithm (GP-65)**
  - Call RRT
  - Page 8080 (acute stroke pager)
  - NIHSS pre and post head CT
  - STAT head CT
  - Cardiac monitor/NIBP/Pulse ox/blood glucose/weight
  - RRT physician to provide LKW and history
  - RN to transport to CT ASAP if transport cannot respond within 5 minutes
  - STAT labs as ordered by stroke neurologist
  - NPO until passes stroke swallow screen
  - If patient is at GB/HP/SK- nursing consultant to call ***Superior Critical Care Ambulance with RN "Load and Go, Lights and Siren"*** for possible transfer to EVH interventional radiology (IR) suite
  - Stroke neurologist to review CT scan

New: Stroke GP 65

- Positive ICH/LVO
  - Consult neurosurgery
  - Transfer to EV
- No ICH
  - Is patient an IV tPA candidate?
  - Stroke neurologist places IV tPA order
  - Informed consent
  - Transfer to ICU for IV tPA administration
    - If ICU bed not available, ICU RN to administer IV tPA in patient's current location to meet needle time (<60 minutes)
- Not IV tPA/ endovascular intervention candidate – admit to inpatient stroke unit

Questions?