Acute Stroke

Sarah Sullivan, DO
Medical Director, Stroke Center
Northwest Medical Center

Acute Stroke

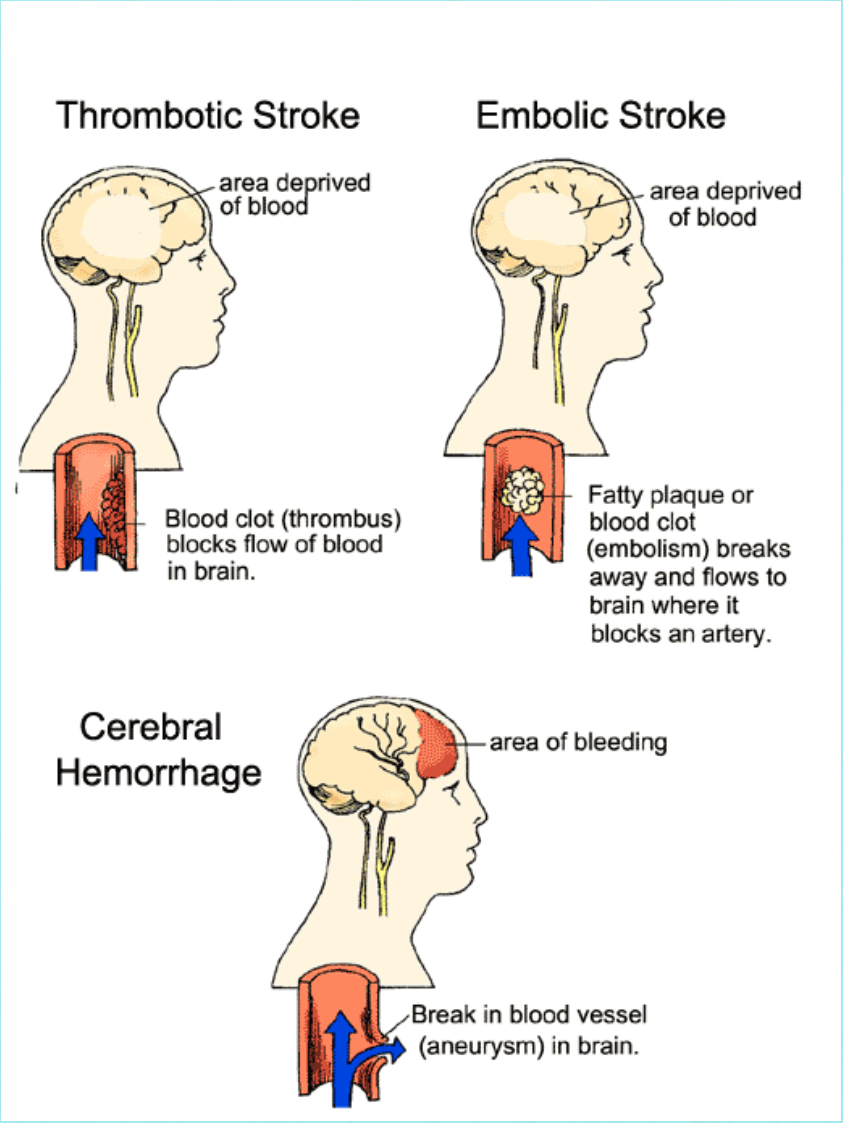
- Definitions,Epidemiology, Classification, and Etiologies
- Clinical manifestations and Mimics
- Acute Stroke
  - Testing
  - Medical therapy
  - Intervention
- A word about Transient Ischemic Attack
- Post-stroke Follow up

Definitions

- Stroke: The sudden death of brain cells due to lack of oxygen from impaired blood flow
- TIA: a transient stroke
  - Most last less than 5 min
  - No deficit, no abnormality on imaging
- RIND (Reversible Ischemic Neurologic Deficit) - No longer used

Stroke: Epidemiology

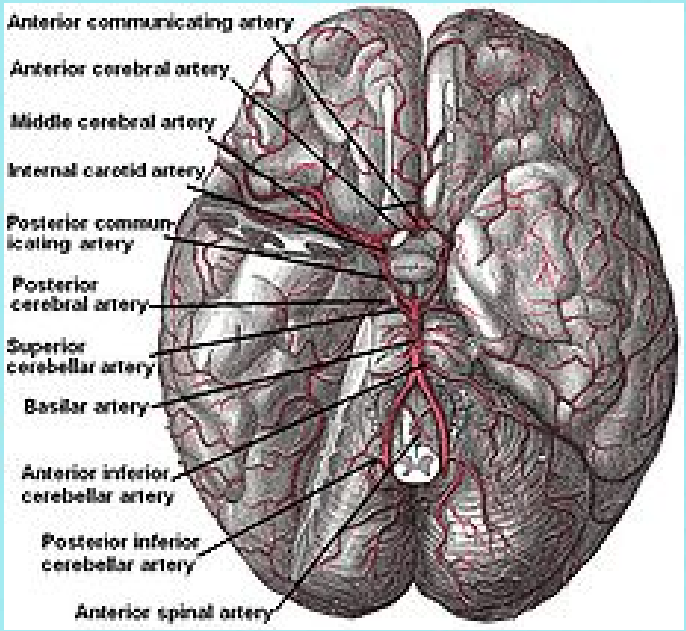
- Ischemic Infarct
  - Embolic
  - Thrombotic
- Hemorrhagic infarct
  - Intracranial
  - Subarachnoid



http://www.google.com/imgres?imgurl=http://www.musclepaindoctor.com/sitebuildercontent/sitebuilderpictures/stroke3.gif&imgrefurl=http://www.musclepaindoctor.com/id8.html&usg=__U0ZdUTrF1YuBF_pmcuNMOkzkNAs=&h=693&w=520&sz=32&hl=en&start=71&zoom=1&tbnid=N2FkOiauzG64mM:&tbnh=133&tbnw=100&ei=g5l9TY3VEIT0tgP7ubz4Ag&prev=/images%3Fq%3Dstroke%26um%3D1%26hl%3Den%26biw%3D1050%26bih%3D719%26tbs%3Disch:10%2C1634&um=1&itbs=1&iact=hc&vpx=716&vpy=363&dur=462&hovh=142&hovw=107&tx=84&ty=140&oei=05h9TYrhKI-isAPlqOWKAw&page=4&ndsp=24&ved=1t:429,r:10,s:71&biw=1050&bih=719

Stroke: Classification

- Ischemic Infarct: Embolic/Thrombotic
  - Large Vessel
  - Small Vessel
- Hemorrhagic Infarct
  - Intracerebral
  - Subarachnoid



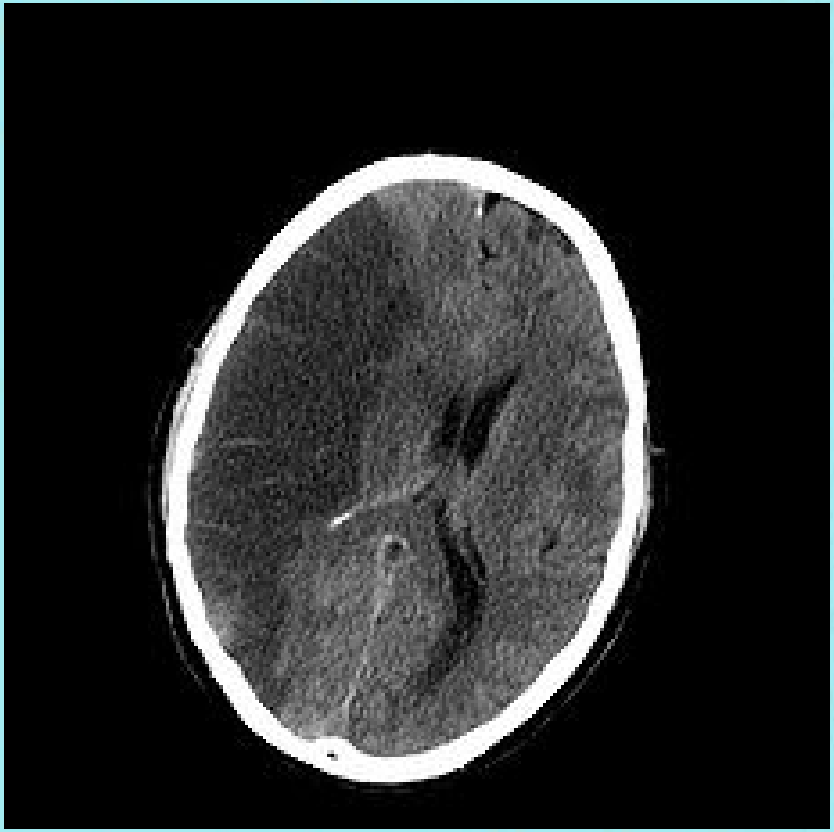
http://en.wikipedia.org/wiki/Lacunar_stroke

Stroke: Classification

- L-MCA = aphasia; R-hemiparesis or sens dist; R-homon hemianopia,L-head/gaze preference
- R-MCA = L-hemi neglect, L-hemiparesis or sens dist; L-homon hemianopia, R-head/gaze preference
- L-PCA = R-visual field defect; alexia without agraphia; poor color naming; R-hemisens disturbance
- R-PCA = L-visual field defect; visual neglect; L-hemisens dist
- Vertebrobasilar = Dizzy/vertigo;N/diplopia; quadriparesis; crossed motor-sens findings
- Penetrating aa (lacunar) = pure motor (int capsule); pure sens (thalamic); mixed motor/sens (thalmus/int capsule); clumsy hand-dysarthria (basis pontis); ataxic-hemiparesis (ventral pons)

Stroke: Etiology

- Ischemic Stroke
  - Embolic
  - Thrombotic
- Hemorrhagic Stroke
  - Intracerebral
  - Subarachnoid



wikipedia.org/wiki/Stroke

Clinical Findings... and some which are NOT

- Impossible to differentiate between Hemorrhagic/Ischemic in the field
- Suggestions of Hemorrhagic Infarct
- Suggestions of Embolic Infarct
- Suggestions of Thrombotic Infarct
- Findings/Symptoms suggestive of another diagnosis

Stroke Mimics: Differential Diagnosis

- Mass Lesions: Tumor/Abscess/SDH
- Seizure/Postictal State
- Metabolic: Hypoglycemia/Hyperglycemia/Hyponatremia
- Migraine
- Reactivation of prior deficits
- Functional

http://mercyjourney.blogspot.com/2009_02_01_archive.html

Stroke Chameleons

- Always, always consider onset and risk factors
- Movement disorders
- Confusional states/agitation
- Transient global amnesia
- Cortical blindness

http://www.flickr.com/photos/nikographie/745703428/

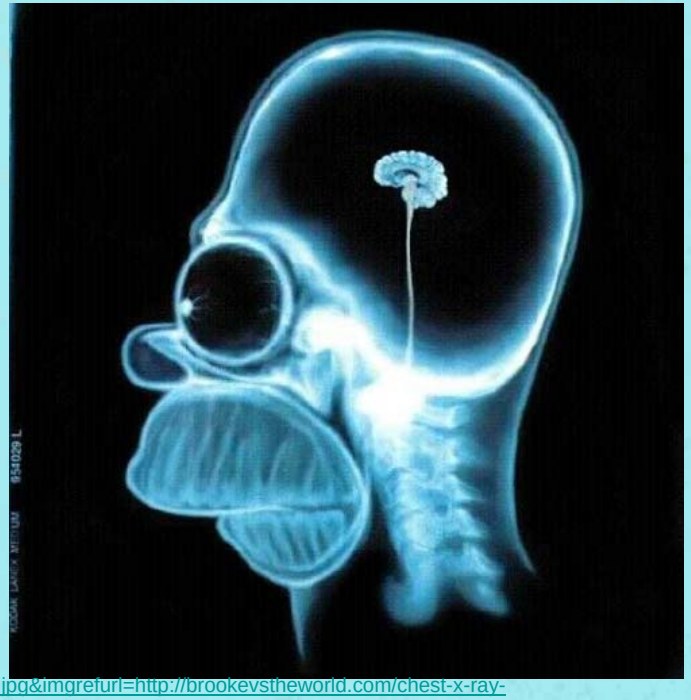
Acute Stroke: Important Pre-hospital Considerations

- Low-threshold for suspicion is Critical!
- Cincinnati Stroke Scale
- Focused Medical History
- Time of Onset = Time Last seen normal
  - “Dad was fine when we went to bed at 1
  - “Mom was fine when we left for church 2 hours ago”

http://en.wikipedia.org/wiki/Hourglass

Acute Stroke: Imaging/Testing

- AHA/ASA: Recommendations for Acute Stroke Imaging
  - CT vs MRI - with contrast or without
  - Carotid ultrasound vs MRA vs CTA vs Traditional Angiogram
  - Transcranial Doppler
- Other testing



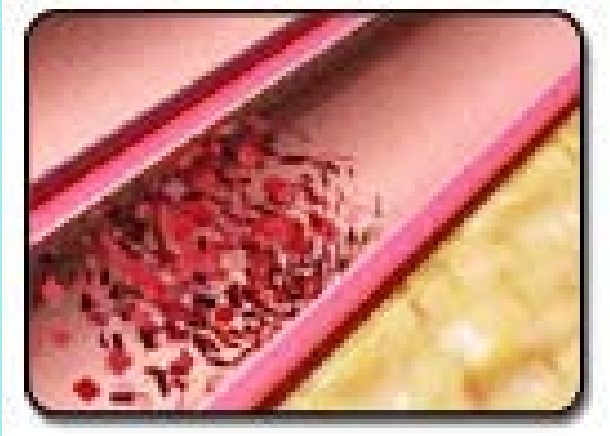
http://www.google.com/imgres?imgurl=http://brookevstheworld.com/wp-content/uploads/2009/03/homer_simpson_xray.jpg&imgrefurl=http://brookevstheworld.com/chest-x-ray-anyone/&usg=__sTzhMlwev3P5Z0c6Qu9N83cFkvo=&h=500&w=500&sz=91&hl=en&start=0&zoom=1&tbnid=X1lnCBTDXh5zjM:&tbnh=128&tbnw=128&ei=xJx9TZGvCo--sAPm9_H5Ag&prev=/images%3Fq%3Dxray%26um%3D1%26hl%3Den%26biw%3D1050%26bih%3D719%26tbs%3Disch:1&um=1&itbs=1&iact=hc&vpx=702&vpy=110&dur=919&hovh=225&hovw=225&tx=125&ty=98&oei=xJx9TZGvCo--sAPm9_H5Ag&page=1&ndsp=23&ved=1t:429,r:4,s:0

Ischemic Stroke: Inclusion/Exclusion for tPA

- tPA in <3 hours
  - Minor/Rapidly improving symptoms
  - Seizure at onset of stroke
  - Stroke/Head trauma in past 3 months
  - Major surgery in last 14 dys
  - Known history of Intracranial hemorrhage
  - Sustained BP >185/110
  - Symptoms suggestive of SAH
  - Serum glucose < 50 mg/dL or > 400 mg/dL
  - PT > 15 sec
  - Plt count < 100, 000
  - GI or urinary tract hemorrhage within the last 21 dys
  - Arterial puncture at non-compressible site in lat 7 dys
  - Receipt of heparin within 48 hours with elevated PTT
  - Relative Contraindications include stroke size estimations
- tPA 3-4.5 hours - ECASS 3
  - Age >80
  - Use of any anticoagulant, even if subtx
  - Hx of prior stroke AND diabetes

Ischemic Stroke: Medical Therapy

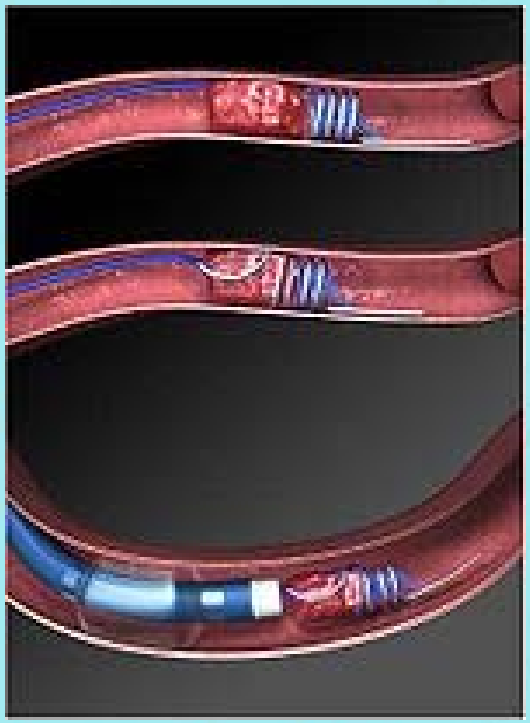
- Thrombolytics
- Anticoagulants
- Antiplatelets
- Other considerations
  - Blood Pressure/Fever/Hypoglycemia/Cardiac Rhythm
  - Statins
  - Age matters! - PFO/dissection/hypercoag state



http://www.google.com/imgres?imgurl=http://www.steadyhealth.com/4542/image/clot_buster.jpg&imgrefurl=http://www.steadyhealth.com/articles/Reducing_Incidence_of_Stroke_with_thrombolytics_s689.html&usg=__gtpBZuAmtZOq-9nEZs_381zJWPg=&h=98&w=137&sz=9&hl=en&start=0&zoom=1&tbnid=s3Ui8zpPIZKLWM:&tbnh=78&tbnw=109&ei=f5t9TZvOC4r4sAPzq9WQAw&prev=/images%3Fq%3Dthrom6tbs%3Disch:1&um=1&itbs=1&iact=hc&vpx=196&vpy=158&dur=955&hovh=78&hovw=109&tx=74&ty=46&oei=Zpt9Td7JJInmsQO3wc2HAw&page=1&ndsp=21&ved=1t:429,r:0,s:0

Ischemic Stroke: Intervention

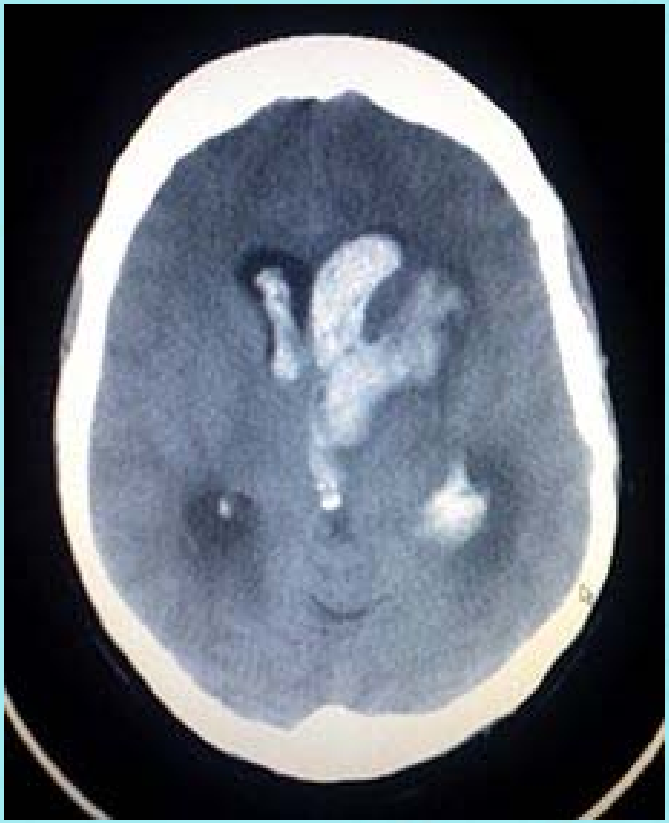
- Intra-arterial thrombolytics
- Angioplasty/Stent placement
- Devices
  - MERCI
  - Penumbra System
- On-going trial: EKOS Ultrasound Device
- Devices not evaluated/Discontinued Studies



http://en.wikipedia.org/wiki/Stroke

Hemorrhagic Stroke: ICH

- Epidemiology/Pathophysiology
- Risk Factors
- Clinical Findings
- Diagnosis
- Treatment
- Prognosis



Thttp://en.wikipedia.org/wiki/Intracranial_hemorrhageext

Hemorrhagic Stroke: SAH

- Epidemiology
- Pathophysiology
- Clinical Findings
- Diagnosis: Imaging/LP
- Complications
- Treatment Considerations

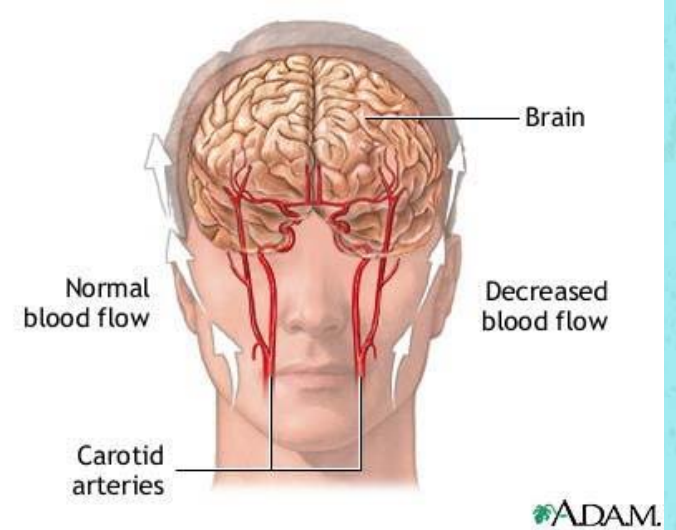
http://en.wikipedia.org/wiki/Subarachnoid_hemorrhage

Stroke Complications

- Intracranial
  - Progression of Penumbra to Infarction
  - Hemorrhagic Transformation
  - Edema/Increased ICP
  - Recurrant stroke; Seizure
- Extracranial
  - Aspiration Pneumonia
  - Acute Hypertensive Response

A word about TIA

- "The equivalent of unstable angina."
- Why should TIA be treated as a neurologic emergency?
- Treatment considerations:
  - Addition of/Change in antiplatelet
  - Evaluation of Carotid/Vertebral Steno
  - New-onset/Paroxysmal atrial fibrillation
  - Cholesterol Guidelines/BP guidelines
  - Other



http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001743/figure/d19e2189/?report=objectonly

Your patient's post-stroke Follow-up

- Secondary Prevention Guidelines
  - Antiplatelets/Anticoagulation
  - Statins
  - Antihypertensives
  - Internal Carotid Stenosis
- Lifestyle Intervention
- Therapy
- Note: Screen for Depression! (30-40%)

http://www.google.com/imgres?imgurl=http://www.thecamreport.com/images//stroke1.jpg&imgrefurl=http://www.thecamreport.com/category/g-conditions-to-treat/stroke/&usg=__8XBMlxhNl0BIW7YTvSDOayUzCb0=&h=318&w=318&sz=8&hl=en&start=0&zoom=1&tbnid=pdHGLmc1GIMdSM:&9&oei=CJt9TYnYOZOgsQPcrvS

The End - Thank you!

Questions?

- Sarah.Ainsa@gmail.com