STROKE

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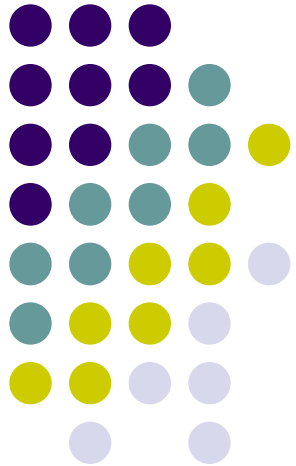
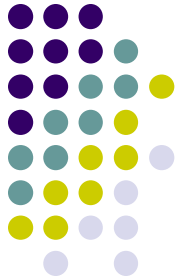


Why is Stroke Important



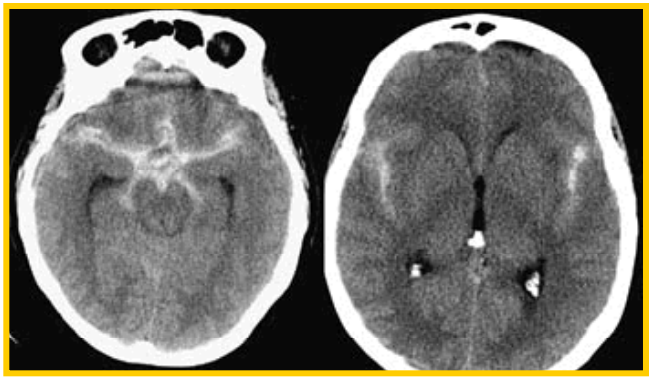
- Leading Cause of Disability in the U.S.
- 3rd Leading Cause of Death in the U.S.
- N.C. lies in the Stroke Belt
- The Stroke Belt has the highest morbidity and mortality from Stroke in the U.S.
- The Buckle of the Belt includes NC, SC and Georgia

Cerebrovascular Disease: Stroke Subtype

Hemorrhagic Stroke (17%)

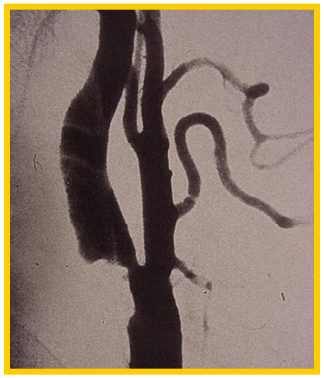
Intracerebral Hemorrhage (59%)

Subarachnoid Hemorrhage (41%)

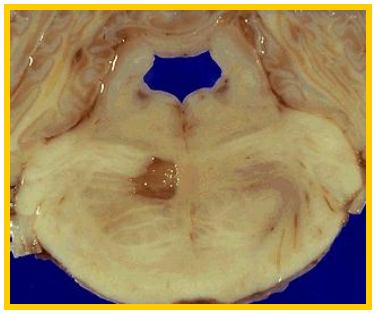


Ischemic Stroke (83%)

Atherothrombotic Cerebrovascular Disease (20%)



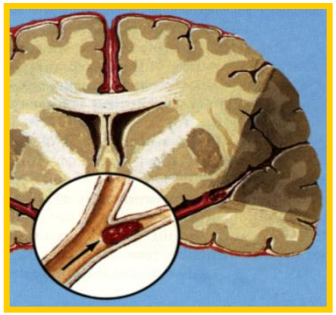
Lacunar (25%) Small vessel disease



Cryptogenic (30%)

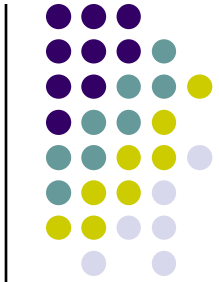
?

Embolism (20%)



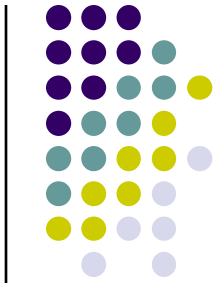
Albers GW et al. *Chest*. 1998;114:683S-698S.
Rosamond WD et al. *Stroke*. 1999;30:736-743.

Transient Ischemic Attack



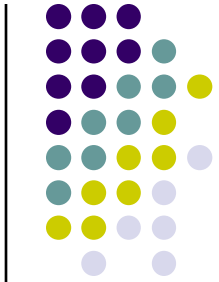
- About 25% of patients will have warning symptoms (TIA=mini stroke) before a stroke
- TIA's identify people at a higher risk of stroke and provide an opportunity for intervention before a major stroke occurs
- Most TIA's last <20 minutes but may last up to 24 hours
- Between attacks the neurologic examination may be normal.

Incidence of Stroke: Following a TIA or Stroke



- One Month = 5%
- One Year = 12%
- Two Years = 20%
- Three Years = 25%

Stroke Warning Signs



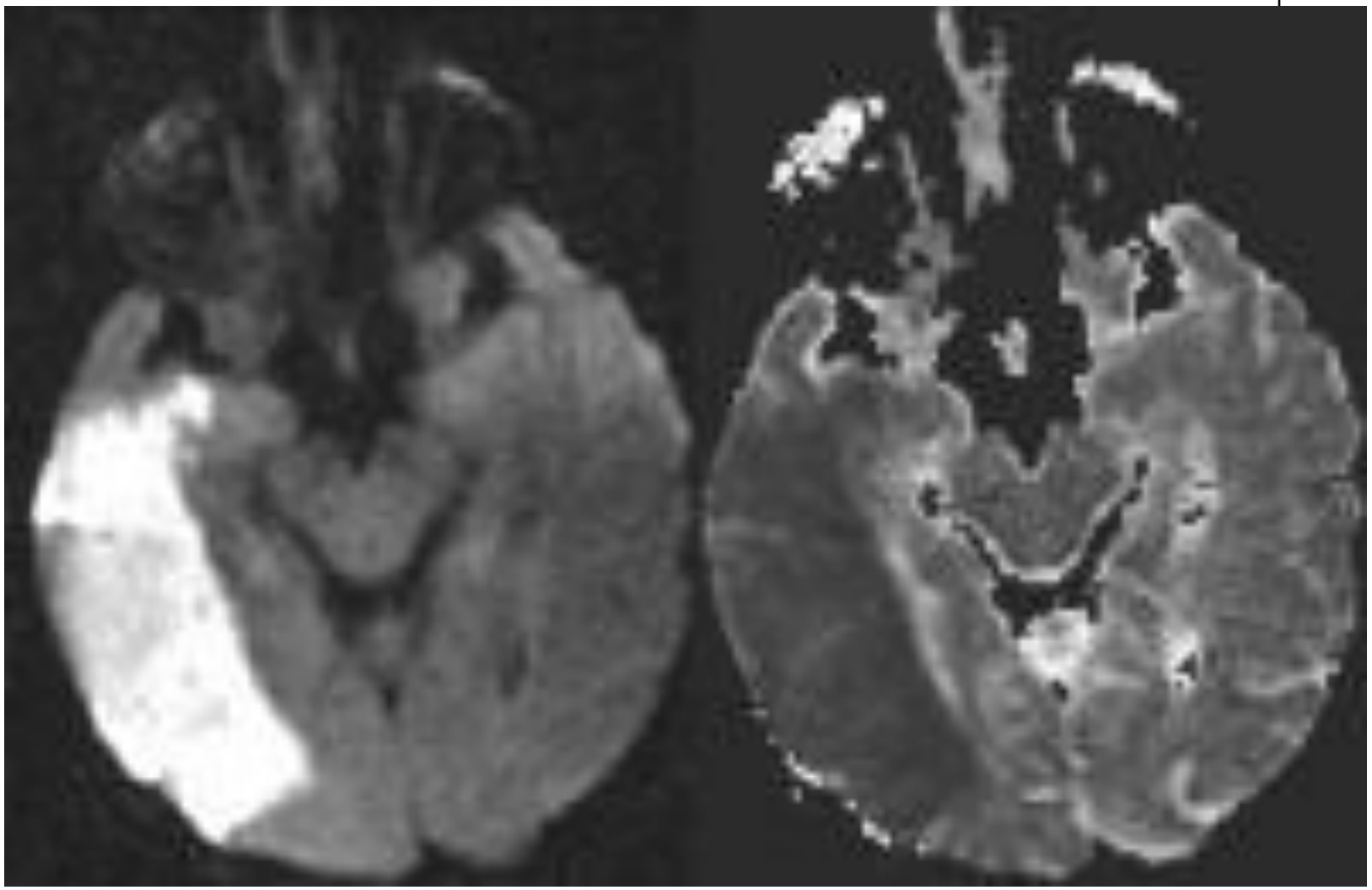
- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden, severe headache with no known cause
- Nausea or Vomiting

Acute Stroke: Barriers to Treatment

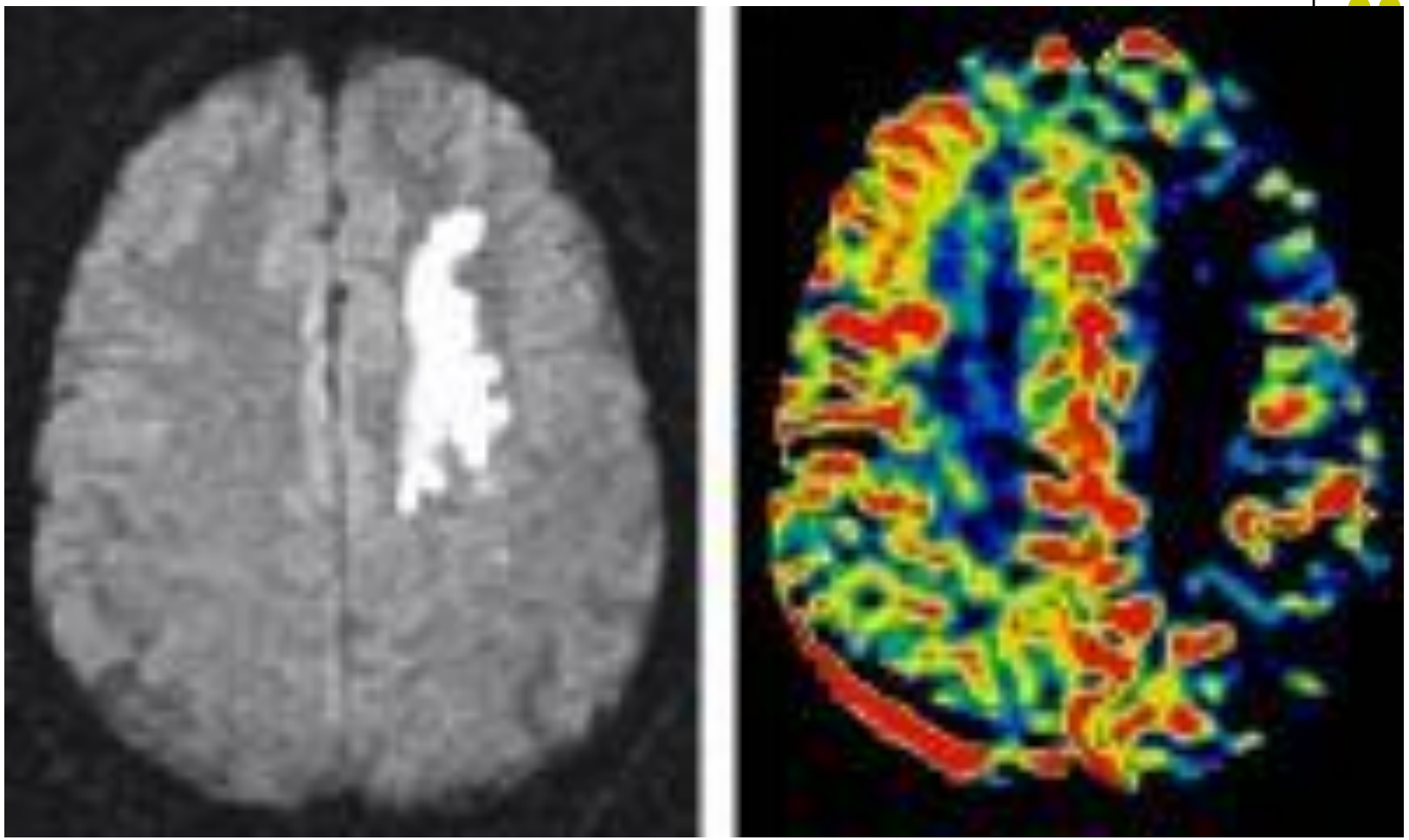
- Only 5 - 20% of stroke patients seek medical attention within 3 hours of symptom onset

- A large proportion of stroke patients do not know the signs or symptoms of stroke

MRI- Diffusion weighted images

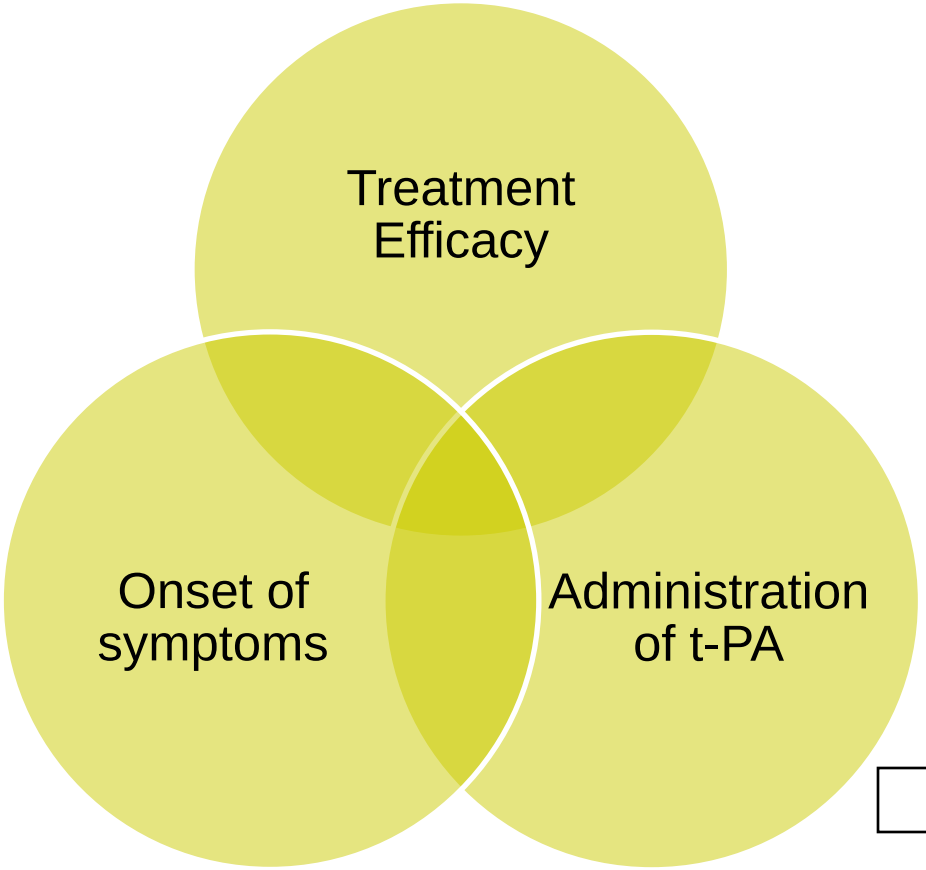


Diffusion-perfusion mismatch



Acute treatment option

- Pooled analysis of NINDS + six other trials



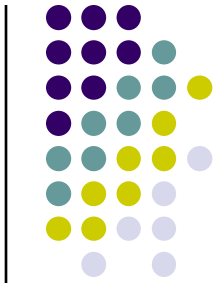
- Favorable outcome with treatment given between 3 and 4.5 hours

Hacke W, et al. *N Eng J Med* 2008:359:1317-29

ECASS Trial – 2008!

- Showed efficacy for IV t PA given up to 4.5 hours.
- Inclusion criteria same a 3 hour window but excluded patients with severe stroke, diabetes and a h/o stroke, arterial aneurysm or liver disease.
- UNC is the only hospital in the area using the 4.5 hour window for IV t PA.

Intra-Arterial Thrombolysis (IA tPA)

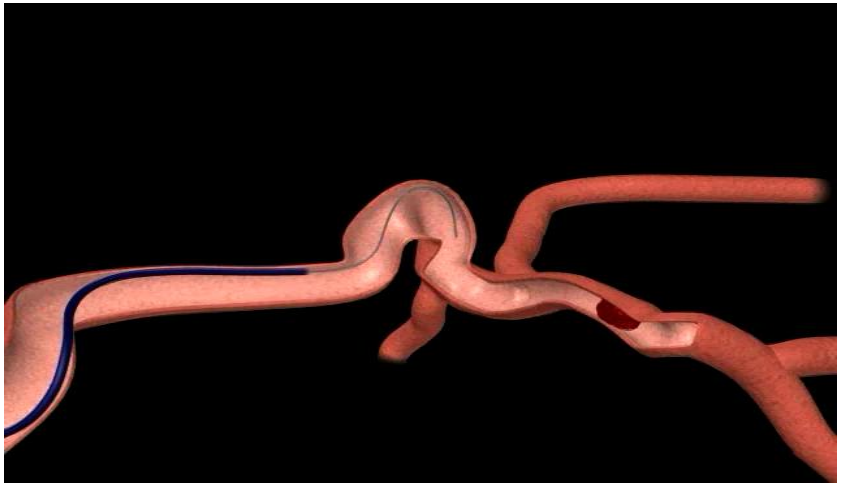


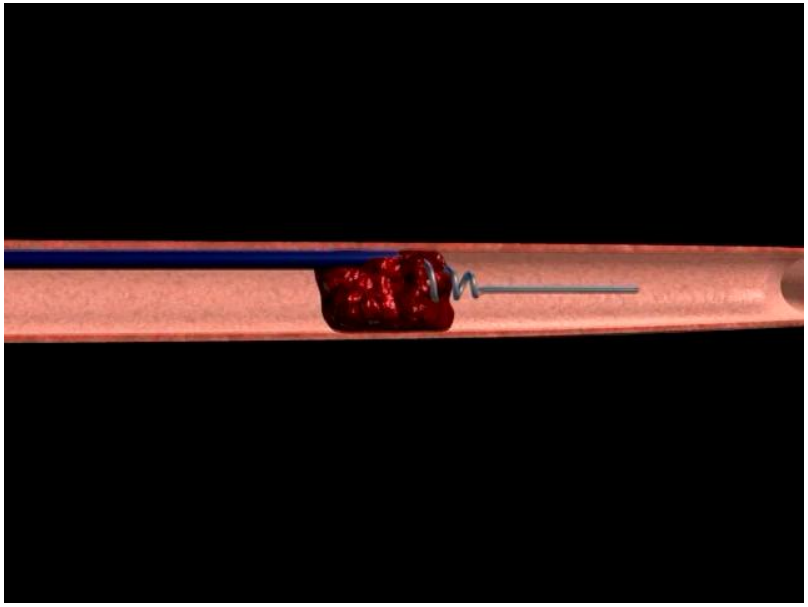
- tPA administered under angiographic guidance
- Not FDA approved, however used on a compassionate basis
- May be given up to 6 hours for anterior circulation strokes
- May be given up to 12 hours for posterior circulation strokes

IMS III Trial

- IMS III Trial is a study that will compare IV and IA treatment to giving IV tPA alone.
- Initiated within three hours of stroke onset.
- 900 subjects with moderate to severe ischemic stroke (NIHSS Score ≥ 10)
- Ages 18-80

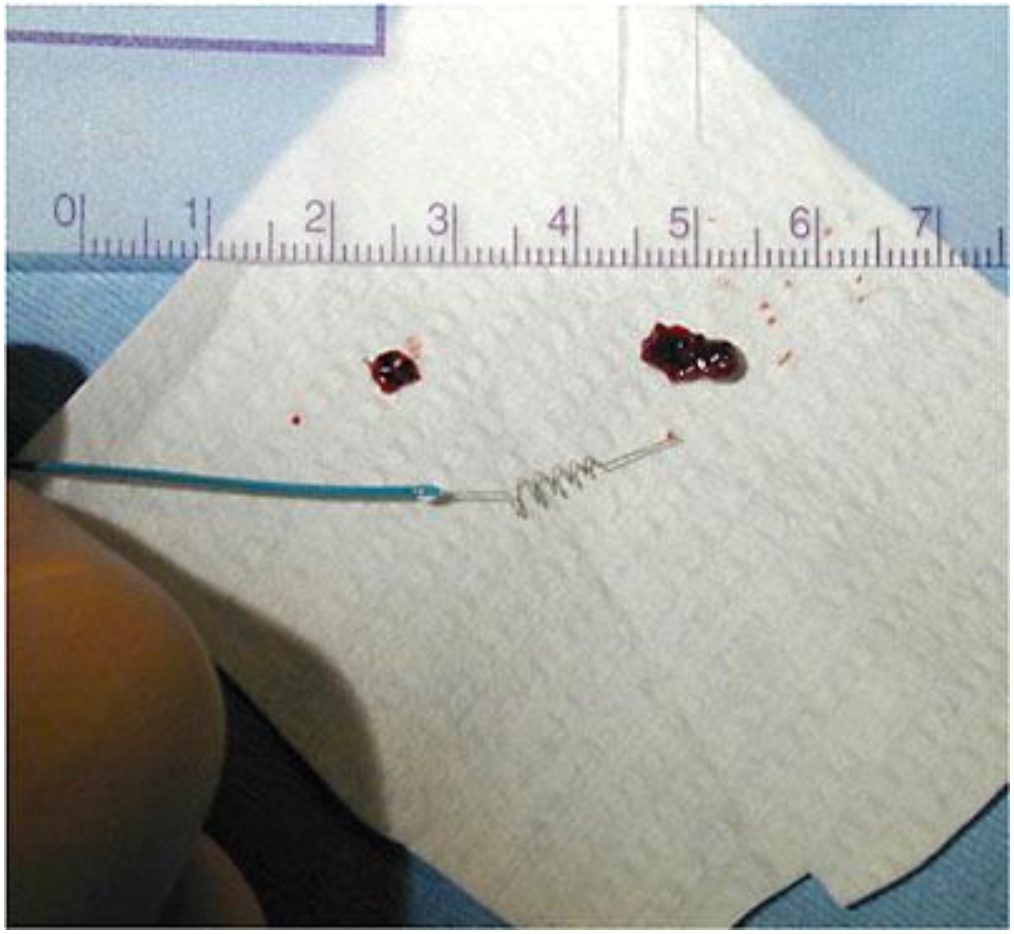
Clot Retriever





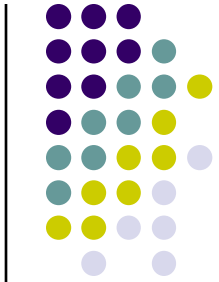
- FDA approved mechanical device for clot retrieval
- Must be used within 8 hrs from symptom onset.
- Used to pull out the clot from the blood vessel causing the stroke.

Clot Retriever



STROKE TRIALS

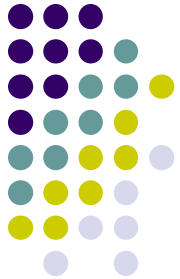
NEST-2 Trial for Acute Ischemic Stroke



- Non-Invasive, Near-Infrared Energy Treatment for Ischemic Stroke

- **<u>24-Hour Treatment Window</u>**

How Does it Work?

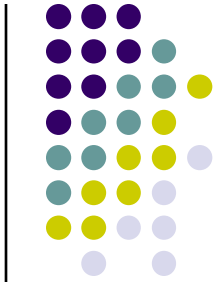


- Exact Mechanism has yet to be Elucidated
- Mitochondrial Cytochrome C Oxidase -Photoreceptor
  - 808nm light absorption
  - Proton gradient drives ATP (energy) formation
  - Selected infrared 808 nm wavelength is able to transmit through skin and bone to reach the brain
- Effects May Include
  - Improved cells energy metabolism
  - Prevention of cell death
  - Enhancement of cell recovery mechanisms

Nest-2: Conclusions

- TLT within 24 hours demonstrated safety but was not statistically significant for efficacy.
- Analyses showed a favorable trend consistent with NEST-1.
- Both studies showed treatment was safe and did not adversely affect patient outcome.
- Nest-3 is being planned with redefined baseline NIHSS criteria.

ALIAS: ALbumin In Acute Stroke



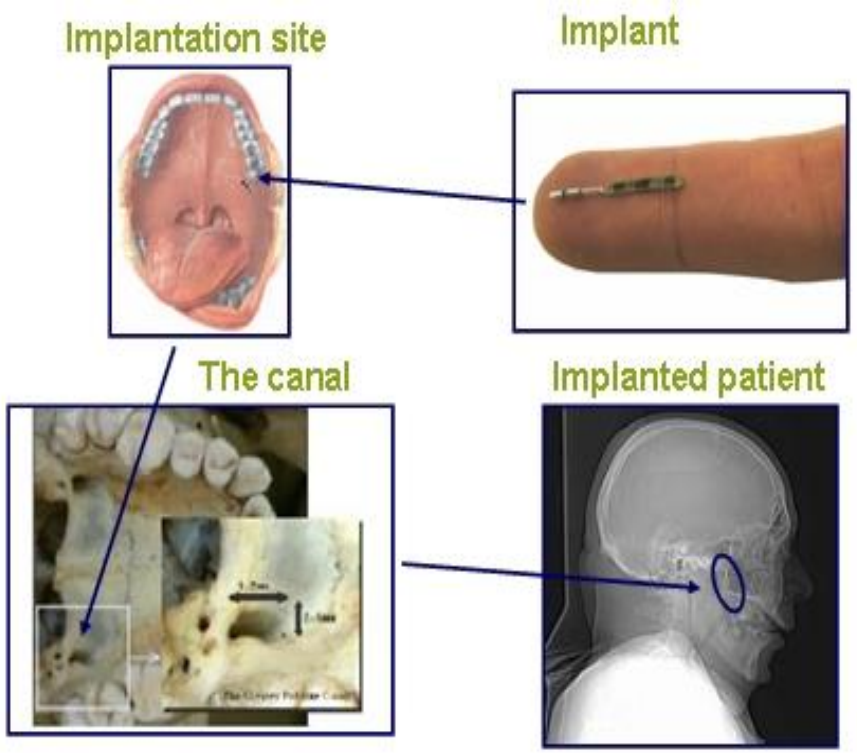
- Albumin therapy is highly neuroprotective in animal models
- May be given with tPA
- Albumin diminished total stroke volume by 67% and reduced brain swelling by 75%
- Albumin acts via multiple mechanisms, which includes the amelioration of brain swelling and the improvement of blood flow

DIAS-3/DIAS-4

- Desmoteplase, derived from vampire bat saliva
- Previous trials (DIAS1 and DEDAS2) shown to have specific action, to be safe and effective over a longer treatment window (3-9 hours) than IV t PA
- Efficacy in these trials was measured as the amount of reperfusion (restoration of blood flow) and clinical outcome at 3 months

BRAINSGATE


Controller
Driver
Transmitter


Implantation site
Implant
The canal
Implanted patient

Prevention

- Jupiter trial showed a benefit of “statins” for patients with low cholesterol but high CRP (C-reactive protein) a marker of inflammation.

- New clinical trial at UNC – prolonged cardiac monitoring to detect atrial fibrillation.

Time Is Brain
and Lost Time Is Lost Brain

UNC HEALTH CARE

THANK YOU!