

The Stroke Center of the Future: What Does This Look Like?

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Conflicts of Interest

- **Consultant**

- Abbott Vascular (non-compensated)
- American Genomics, Inc
- Astra Zeneca Pharmaceuticals, Inc
- Boston Scientific (non-compensated)
- Cordis Corporation (non-compensated)
- Covidien (non-compensated)
- Ekos Corporation (DSMB)
- Medtronic (non-compensated)
- Micell, Incorporated
- Primacea
- Trivascular, Inc.

- **Board Member**

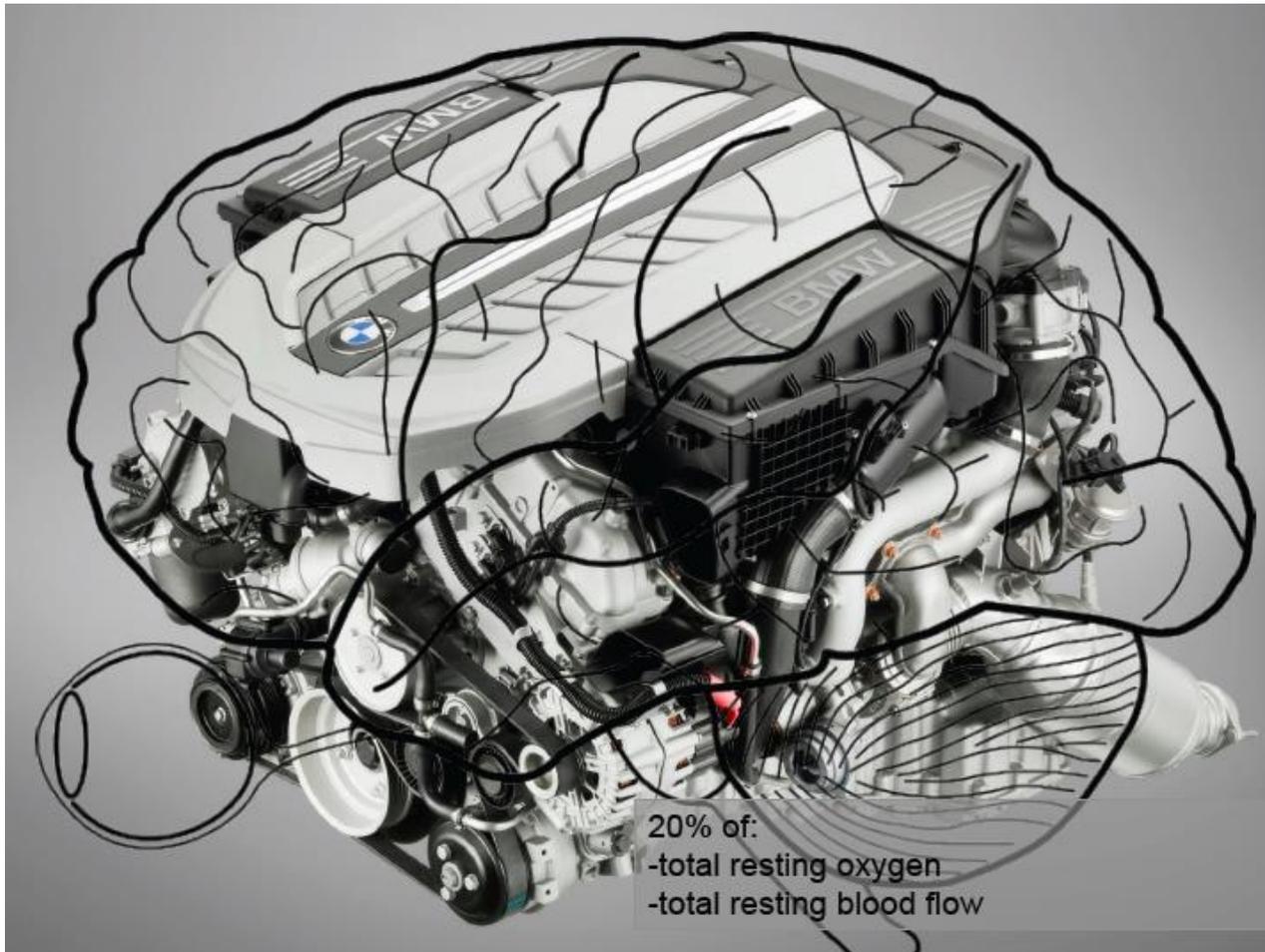
- VIVA Physicians (Not For Profit 501(c) 3 Organization)
 - www.vivapvd.com

- **Equity**

- Access Closure, Inc
- Embolitech, Inc
- Hotspur, Inc
- Icon Interventional, Inc
- I.C.Sciences, Inc
- Janacare, Inc
- MC10
- Northwind Medical, Inc.
- PQ Bypass, Inc
- Primacea
- Sadra Medical
- Sano V, Inc.
- Vascular Therapies, Inc

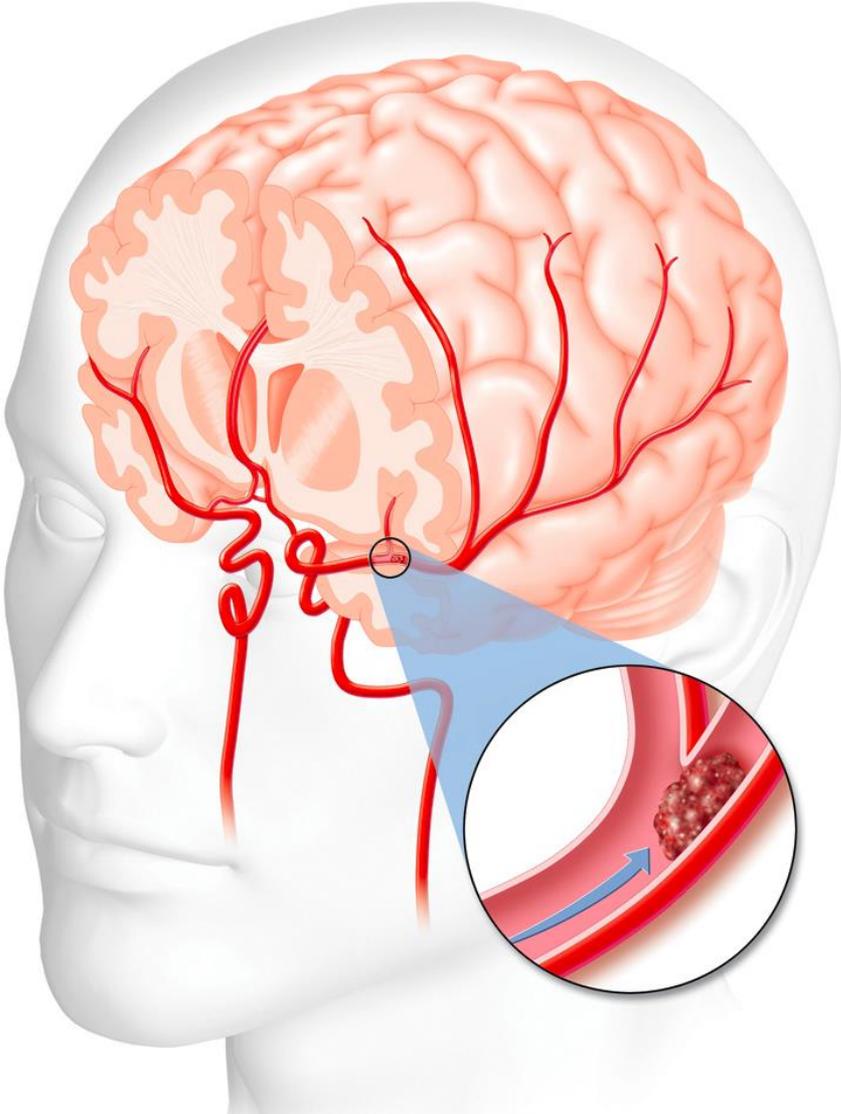
October 2013

Stroke is a Big Deal

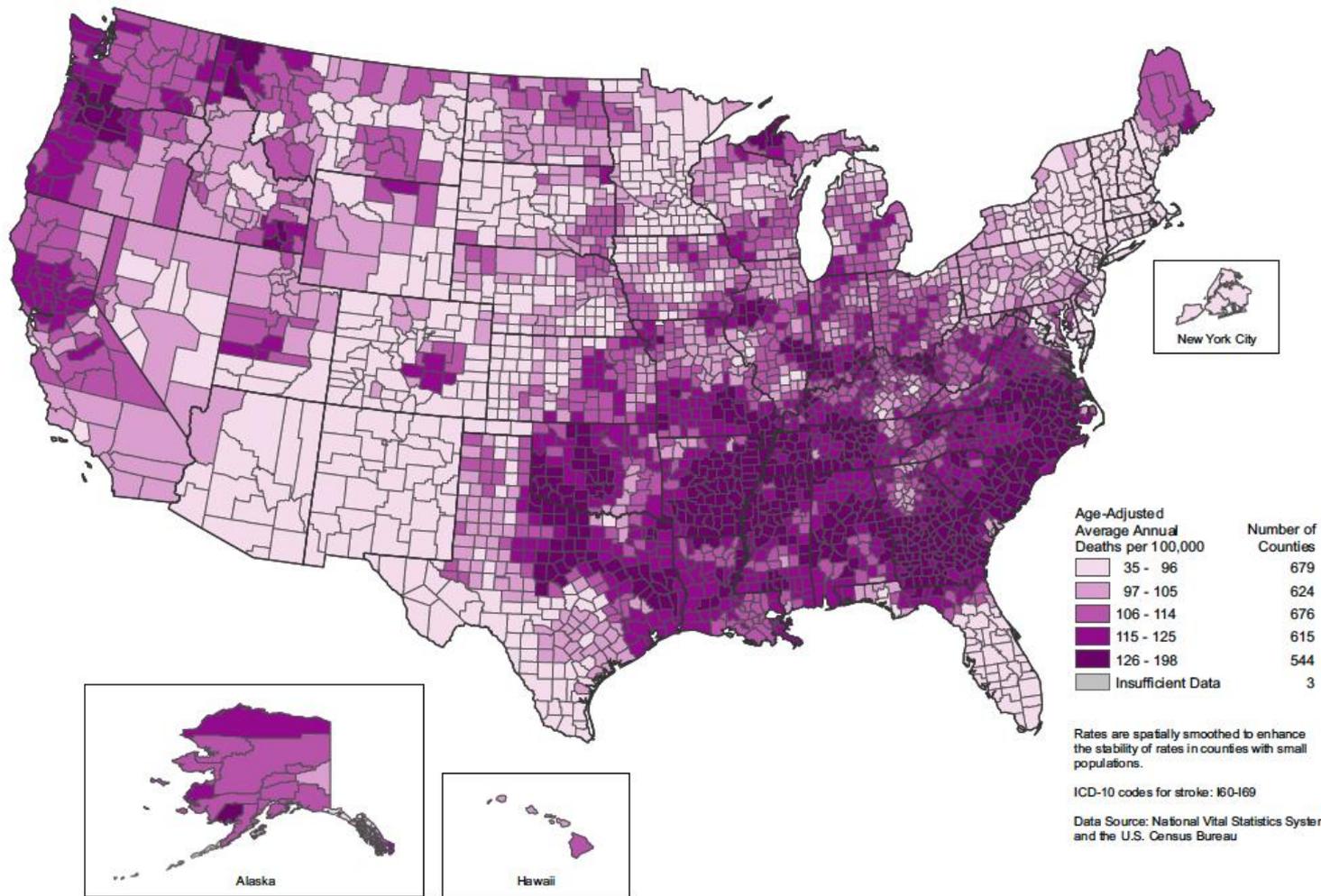


20% of:
-total resting oxygen
-total resting blood flow

And this is what it is all about...



The Stroke Mortality Map



Stroke Stats

- Fourth leading cause of death in the US
 - 134,138 deaths in 2008
 - 1 out of 18 deaths due to stroke in US
 - One American dies of a stroke every 4 minutes
- Most common cause of adult disability
 - 31% of stroke survivors receive outpatient rehabilitation
 - 50% with some hemiparesis
 - 30% unable to walk without some assistance
 - 26% dependent in ADLs
 - 35% depressed
 - 26% institutionalized in a nursing home

Stroke Costs

- Total cost of stroke care 2005-2050 (in 2005 dollars)

\$1.52 Trillion---Non-Hispanic Whites
\$313 Billion---Hispanics
\$379 Billion---Blacks

The Basis of Acute Stroke Therapy

- The **“recanalization hypothesis”**
 - i.e. reopening of occluded vessels improves clinical outcome in acute ischemic stroke through reperfusion and salvage of threatened tissues.

- Several biologic factors weaken the relationship of recanalization to outcome in acute ischemic stroke patients:
 - too late
 - collateral circulation
 - reperfusion injury
 - no-reflow phenomenon

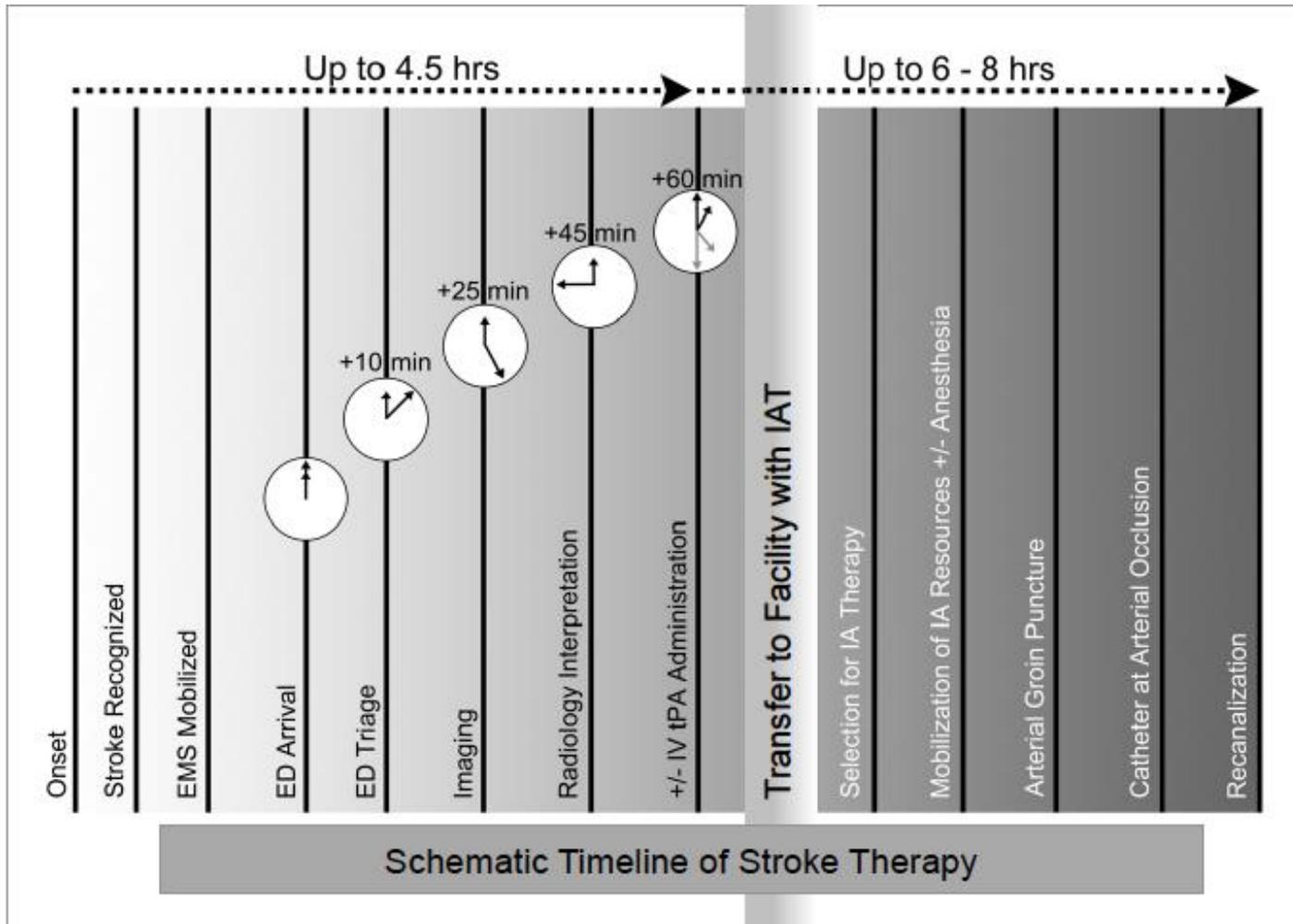
Time is Brain

Estimated Pace of Neural Circuitry Loss in Typical Large Vessel, Supratentorial Acute Ischemic Stroke

	Neurons Lost	Synapses Lost	Myelinated Fibers Lost	Accelerated Aging
Per Stroke	1.2 billion	8.3 trillion	7140 km/4470 miles	36 y
Per Hour	120 million	830 billion	714 km/447 miles	3.6 y
Per Minute	1.9 million	14 billion	12 km/7.5 miles	3.1 wk
Per Second	32 000	230 million	200 meters/218 yards	8.7 h

It is estimated that the typical stroke patient loses 2 million neurons per minute in which stroke is untreated

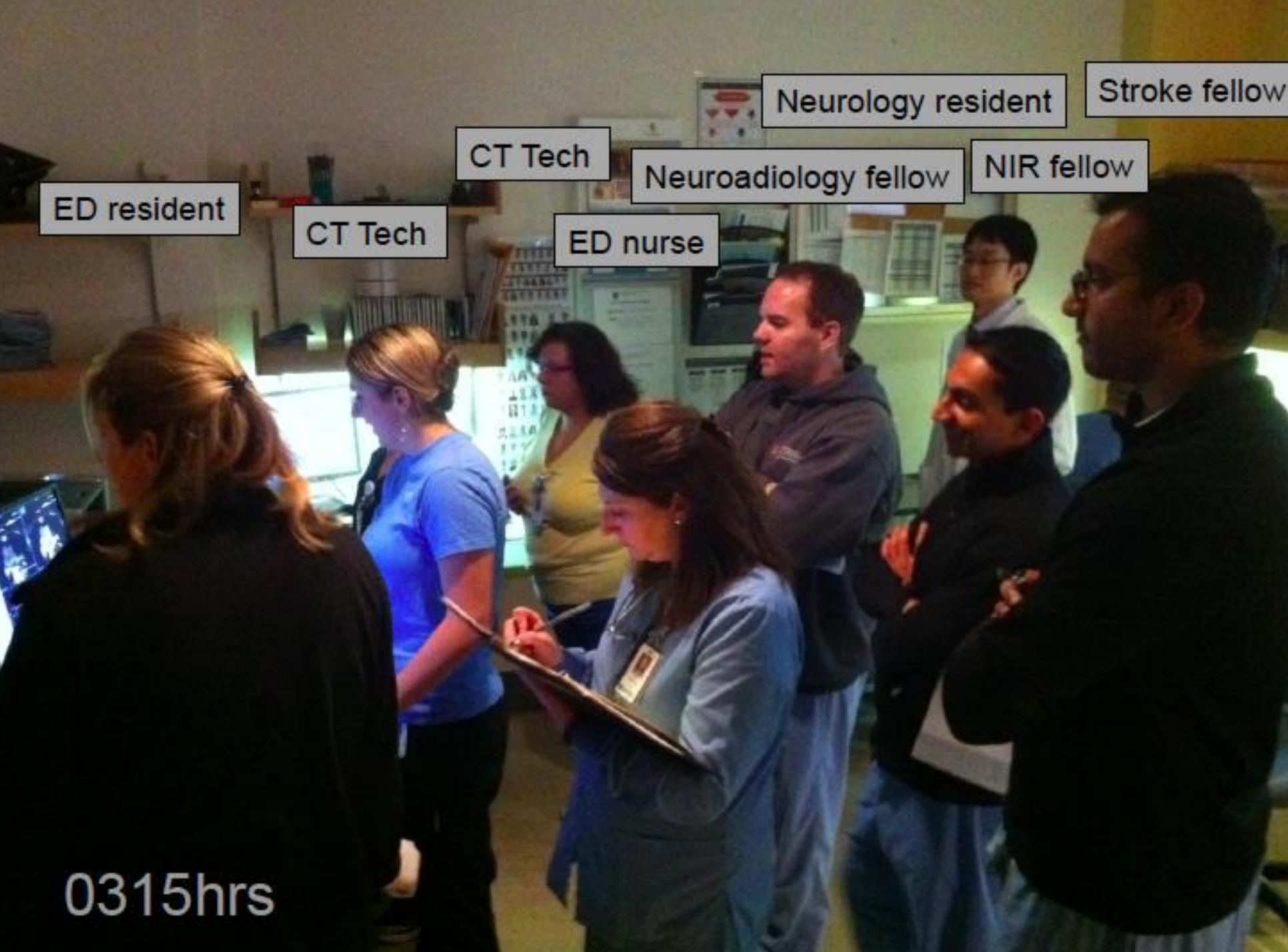
Schematic Timeline of Acute Stroke Therapy



So, How Do We Accomplish This?

- The Stroke Center of the Future
 - Mandatory Components for Success
 - Multidisciplinary
 - The system must work FAST
 - Door → ED → CT/CTA/Perfusion Scan → Needle →
(?) Cooling to 33-degrees C on the way
 - IV rtPA within 4.5 hour window
 - When to proceed to IAT?
 - Center-specific prospective outcomes measurements





ED resident

CT Tech

CT Tech

ED nurse

Neuroradiology fellow

Neurology resident

NIR fellow

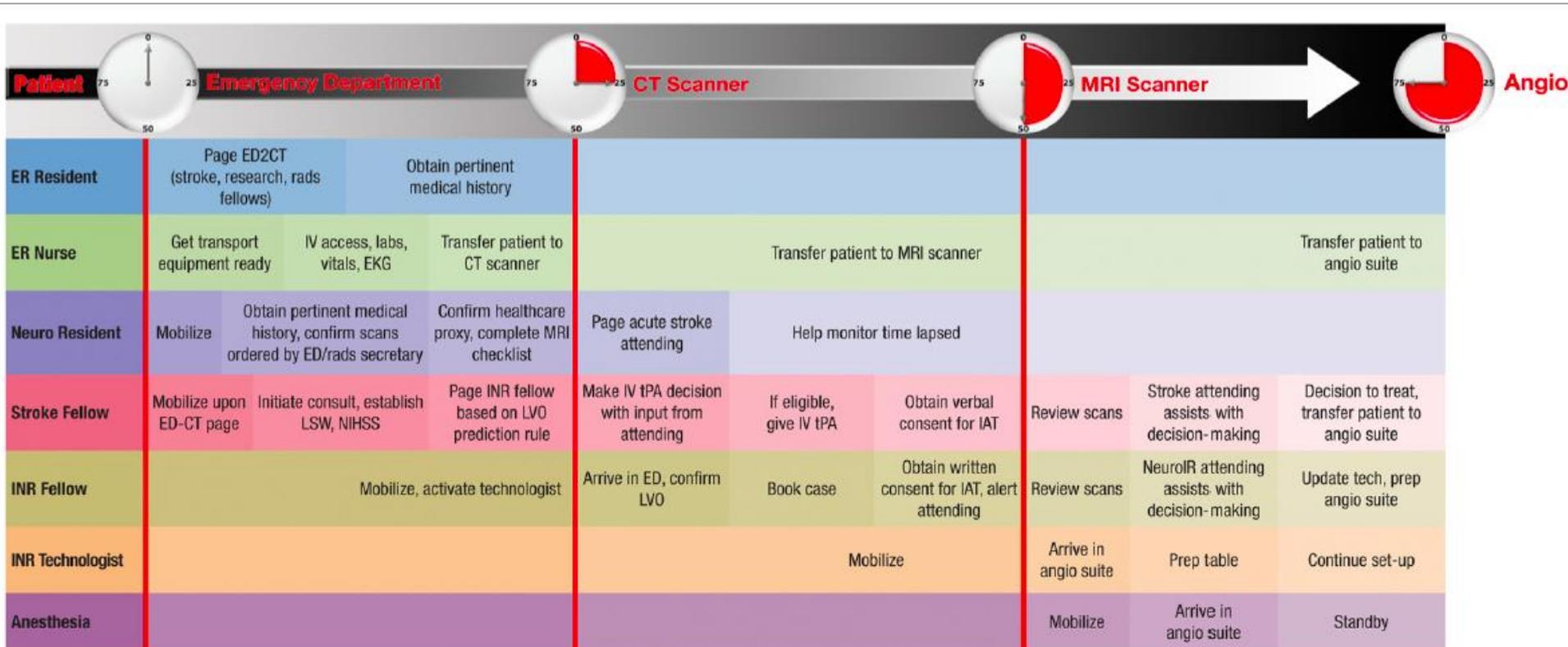
Stroke fellow

0315hrs

The Stroke Team

- Physicians
 - ED
 - Stroke Neurology
 - Neurosurgery
 - Neurointervention
 - Trainees (multiple specialties)
- Nursing
 - ED
 - Stroke Neuro ICU
 - Intervention
- Technology
 - ED Radiology
 - Intervention
- Critical Support
 - Pharmacy
 - Research Coordinator
 - Social Service/Family

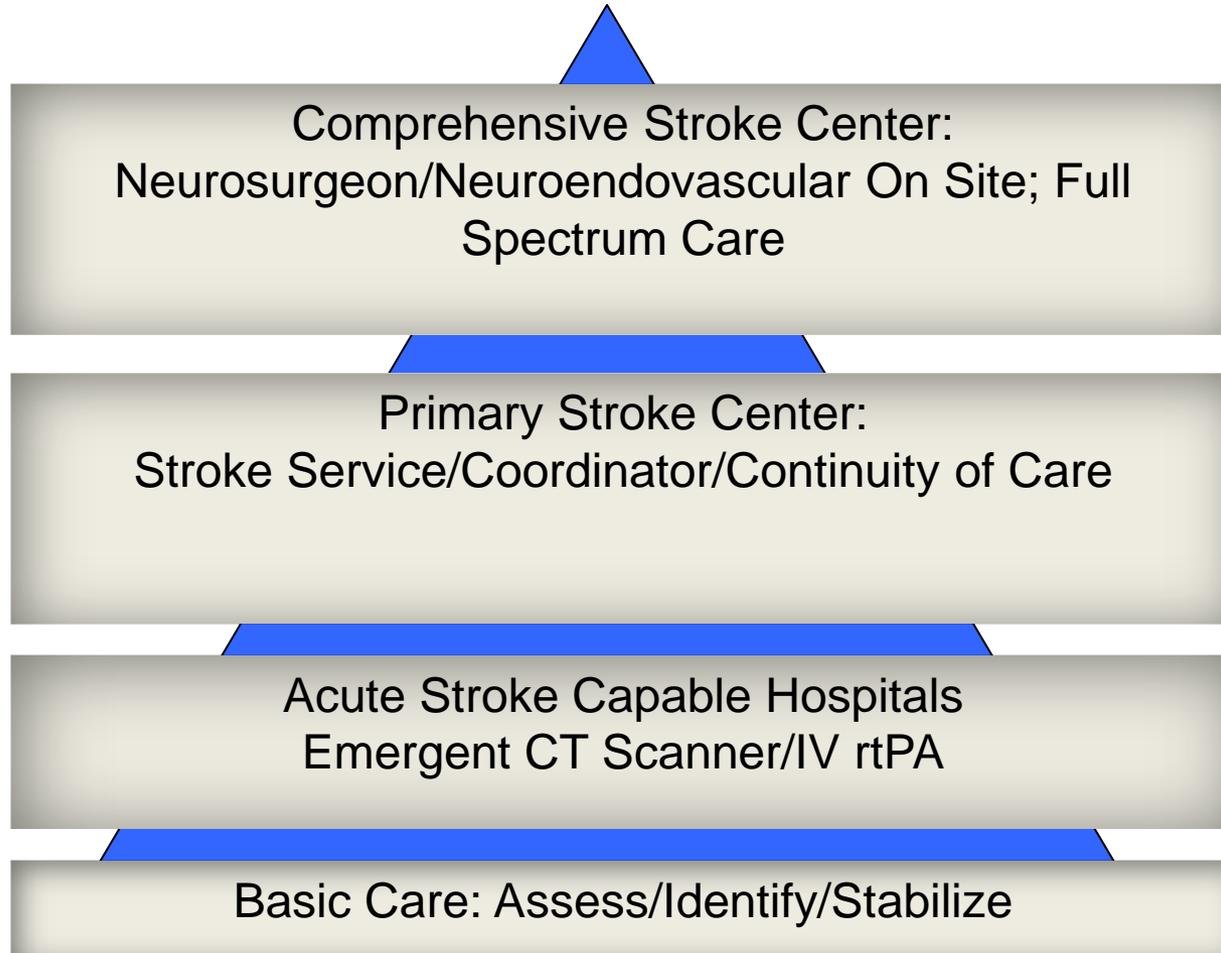
You Must Have the Protocols...



Neurocritical Care Unit



The Stroke Center of the Future



Jacobs Institute, Buffalo, New York



The Stroke Center of the Future

What is Required to Build This?

- Broad expertise across all specialties
- Willingness to break down silos
- Pool finances (sorry, but I don't see this working any other way)
- Institutional Intestinal Fortitude
- A philanthropist who is a believer
- A commitment to prospective outcomes research
- Excellent planning
- Speed is at the center of the program

