Moving Stroke Care Forward in Indiana

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Indiana's Stroke Snapshot

- Approximately 120 emergency-admitting hospitals (non VA or pediatric) in the state
- 1 Comprehensive Stroke Center; 34 Primary Stroke Centers; 1 Acute Stroke Ready Hospital
- Indiana's stroke mortality rate in 2014 was 41.7%, versus the national rate of 36.5%
- Stroke remains the 4th leading cause of death in Indiana, while it is the 5th leading cause of death nationally
- Stroke remains the leading cause of severe adult disability nationally

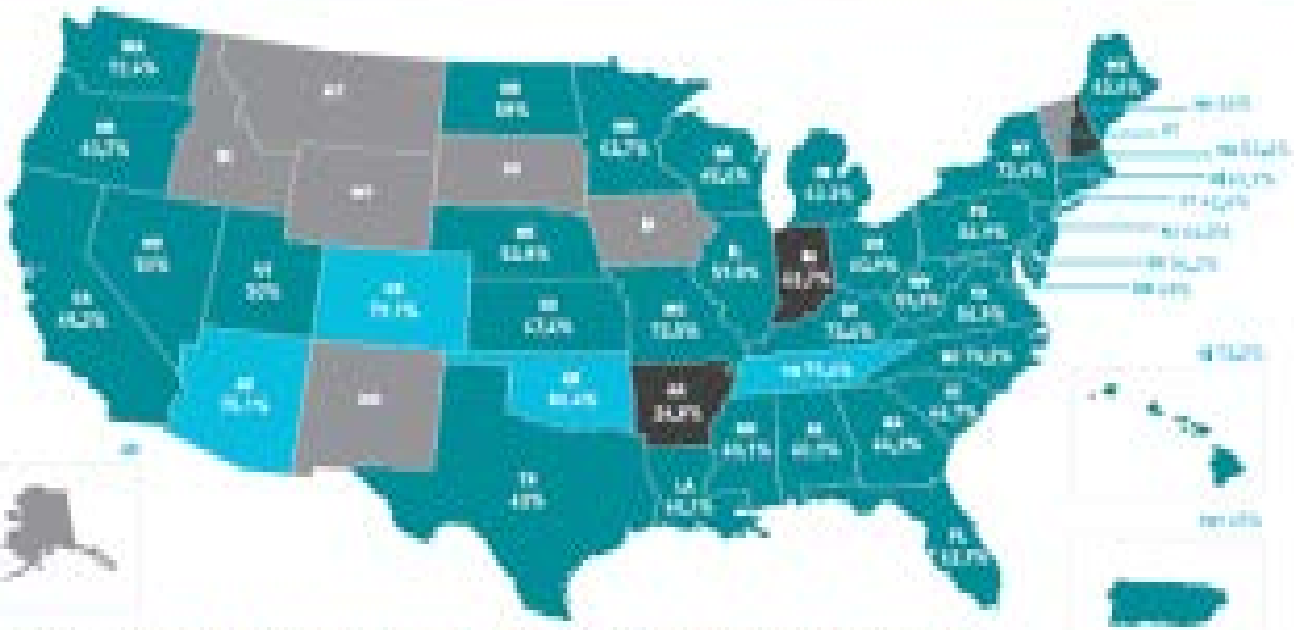
The Problem

- Under current law, Hoosiers who suffer a stroke are too often taken via EMS to hospitals unable to offer sufficient acute stroke care
- These patients are then processed and sent right back out the door to a second hospital with the necessary capabilities
- Minutes count during a stroke, and this type of delay can mean the difference between returning to work or permanent disability; between life and death

How big a problem is this in Indiana?

- According to a state-by-state Get With The Guidelines Target: Stroke review of door-to-needle times using 2014 data, Indiana came in 41st out of the 43 states and territories that participated
- Specifically, Indiana hit the target of door-to-needle within 60 minutes just 43.7% of the time, outpacing Arkansas and New Hampshire, but falling behind everyone else
- This is not exhaustive data and Indiana's numbers have likely improved somewhat, but it is a telling example of just how serious a challenge we face

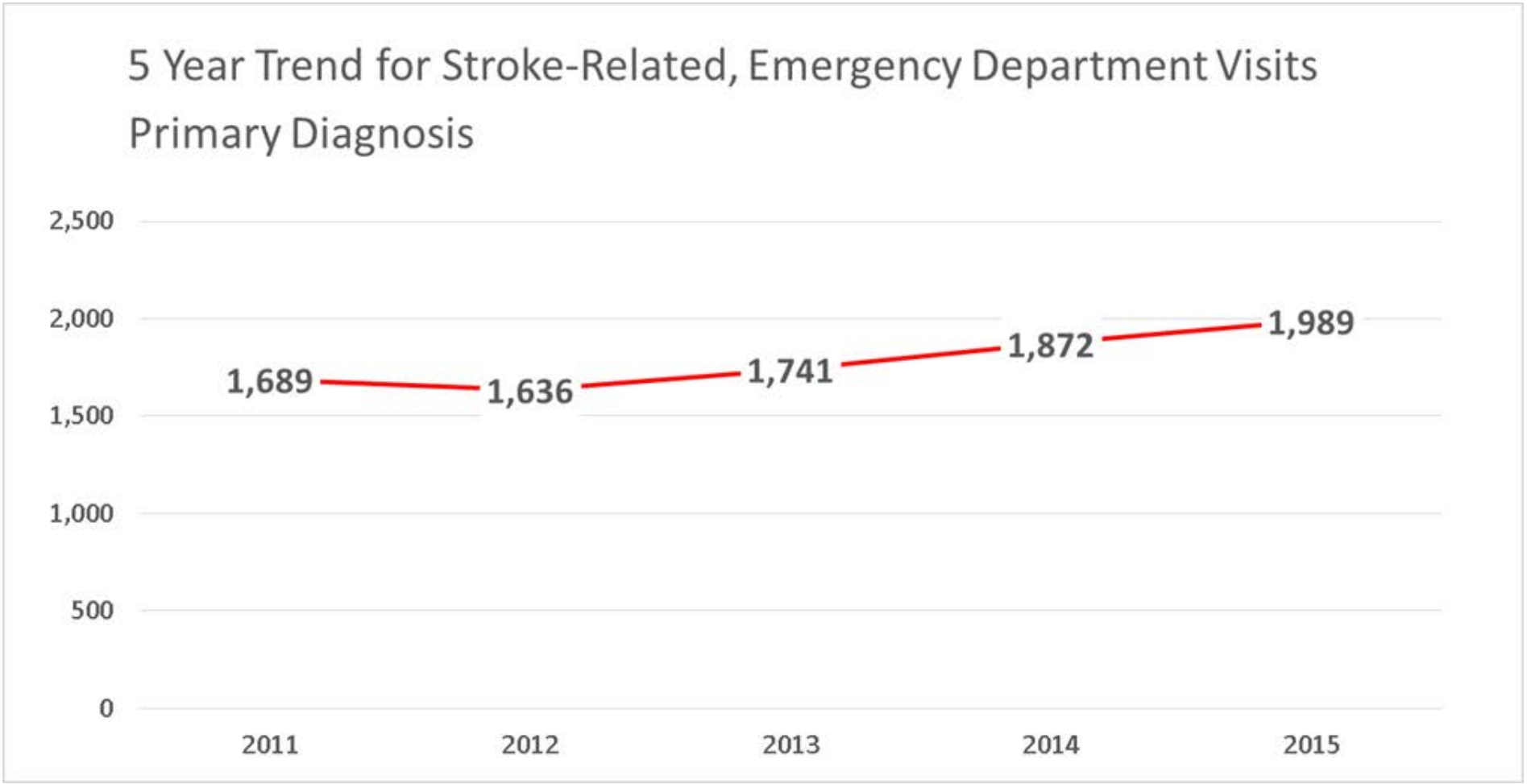
Performance Improvement & Target Stroke



GOAL 75%

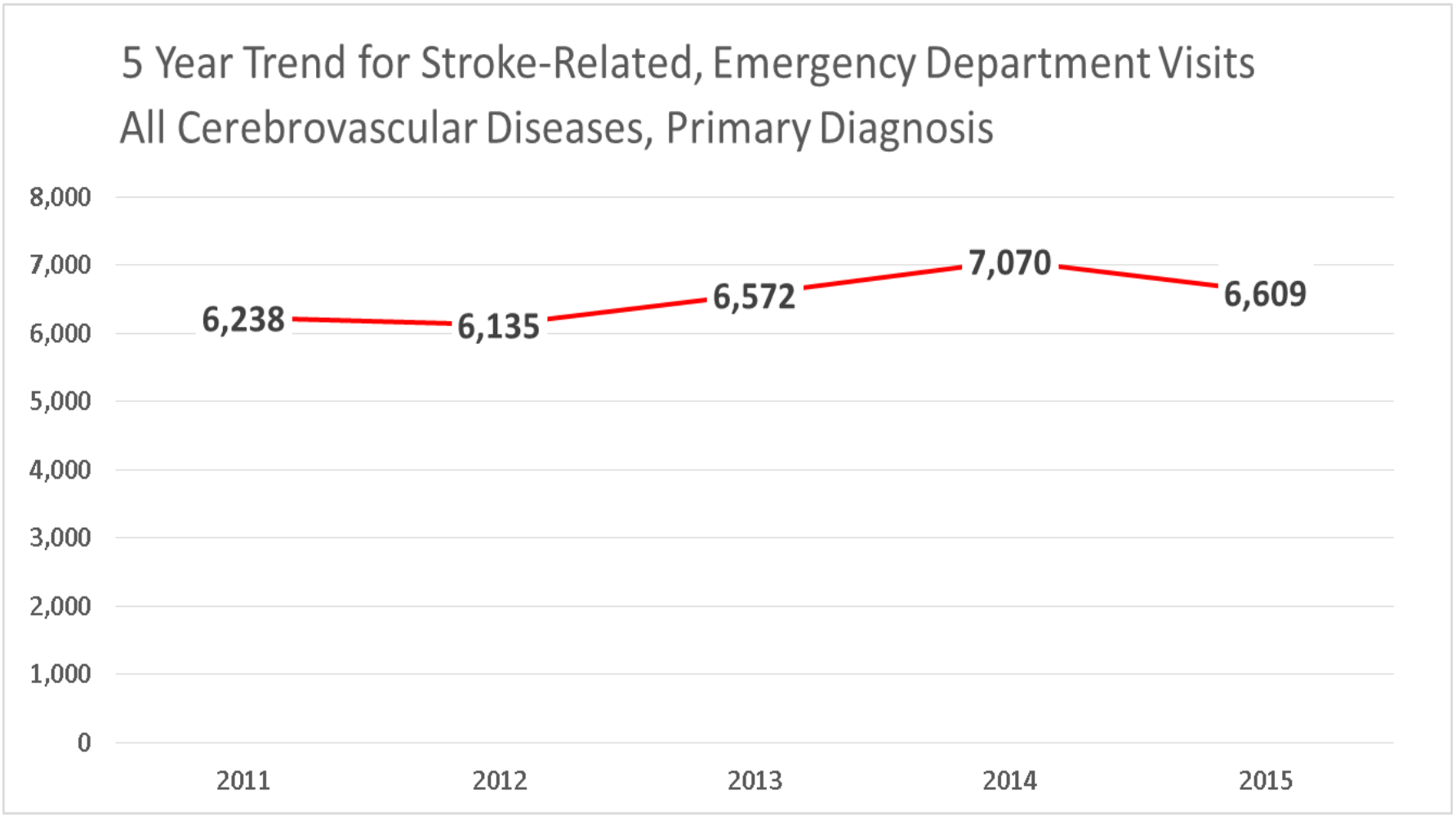
Target: Stroke Phase II aims to achieve Door-to-Needle Times within 60 minutes in 75% or more of acute ischemic stroke patients treated with IV tPA.*

*Eligible Get With The Guidelines®-Stroke/Target: Stroke acute ischemic stroke patients treated between January 2014 to December 2014



Source: Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team. 2017

*The emergency department visits do not represent the number of people who had a stroke within that year. Hospital discharge data are de-identified, which hinders the unduplication of patient visits.



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The Solution – Stroke Legislation

Looking at national science and the experiences of other states that have successfully addressed similar issues, we worked with Rep. Denny Zent (R-Angola) to introduce HB 1145 this past January, a bill designed to:

- Ensure that Indiana's EMS regions develop and adopt stroke-focused EMS protocols based on national standards and written with a focus on local needs and resources
- Ensure that the Dept. of Health maintains a list of designated stroke centers based on national stroke certification at CSC, PSC, and ASRH levels, as well as a list of non-certified hospitals with written transfer agreements to higher levels of care

Stroke Legislation Process

- The AHA/ASA then worked with stakeholders including the IN Hospital Assoc., the Stroke Consortium of IN, the IN EMS Assoc., and the IN Depts. of Health and Homeland Security to fine-tune the bill via amendment language
- Once all parties were on board, HB 1145 moved quickly through the House and Senate, receiving unanimous committee and floor votes, and currently awaits Gov. Holcomb's signature
- HB 1145 will go into full effect on July 1, 2018, allowing time for the IN Dept. of Homeland Security and the IN EMS Commission to lead the protocol development and training process, and for the IN Dept. of Health to create the list of certified stroke centers and network hospitals

Why Legislation?

- As crafted, Indiana's stroke legislation will help increase EMS efficiency in handling stroke patients and incentivize hospital adherence to national evidence-based guidelines without over-burdening providers with costly mandates
- Similar laws are now on the books in 14 states, including Illinois and Kentucky on our western and southern borders
- A poster presented at the International Stroke Conference in February examining the impact of similar legislation in Illinois found "a clear and significant improvement in several care metrics for patients with acute ischemic stroke"

Case Study: Illinois

- Since passage of the 2009 and 2014 IL stroke laws, 73 smaller Illinois-based hospitals have worked with their parent health systems and/or the Illinois Critical Access Hospital Network to become Acute Stroke Ready certified
- To give you a sense of what these laws have meant for patients, consider this:
  - in 2009, roughly 18% of stroke patients received life-saving tPA medication within the nationally-recommended 60-minute door-to-needle window
  - in 2015, 62.4% of stroke patients received tPA within that same 60-minute window, which we know correlates with lives saved and reduced disability

Impact of Stroke Legislation on Developing Stroke Systems of Care and Improving Acute Therapy: The Illinois Experience

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Background

Stroke is a leading cause of death and disability. In 2009, Illinois passed stroke legislation that established a Stroke Advisory Subcommittee to advise the State EMS Advisory Council. The legislation also created 11 EMS Regional Stroke Advisory Subcommittees. Primary Stroke Centers and Emergent Stroke Ready Hospitals were formally recognized, and EMS routing protocols were updated. Comprehensive Stroke Centers were recognized in 2014, and EMS routing protocols were further updated.

Hypothesis

Implementation of the Illinois stroke legislation by EMS regions enhances stroke systems of care, improves collaboration between hospitals and EMS, and improves intervention times and outcomes.

Methods

- Data were ascertained from the Illinois Get With the Guidelines (GWTG) stroke registry from 2009-2015.
- Ninety two unique hospitals entered data from 2009-2015.
- Data points included number of patients, arrival mode, those treated or eligible for IV Alteplase, median door to needle (DTN) times, DTN times of 60 minutes or less, and discharge to home.
- Statistical analyses were performed using chi-square testing

Results

Table 1. Hospitals and Patients Enrolled in GWTG-Stroke in Illinois 2009-2015

Year	Total IL Hospitals Participating in GWTG	Total GWTG stroke patient records	Acute Ischemic Stroke (AIS) Patients Entered into GWTG	AIS patients eligible for IV Alteplase
2009	27	10530	6193	289
2010	38	13077	8094	411
2011	52	14201	9109	628
2012	60	15385	9964	598
2013	73	29288	9977	570
2014	76	19633	10719	650
2015	82	21779	12981	864

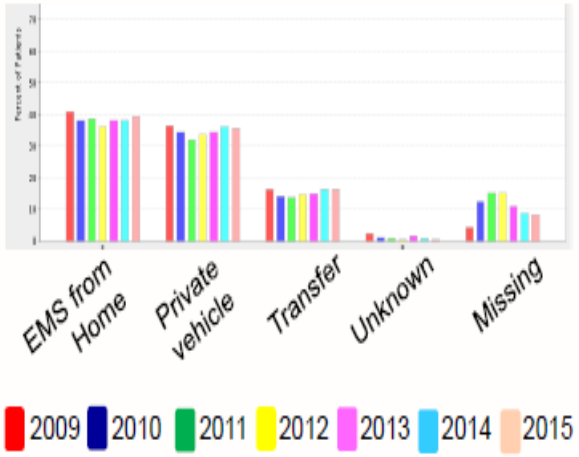
Table 2. Types of Hospitals Participating in GWTG-Stroke in Illinois

Year	Total IL Hospitals Participating in GWTG	ASRHs	PSCs	CSCs	Not Certified as Stroke Center
2009	27	0	14	0	13
2010	38	0	27	0	11
2011	52	0	35	0	17
2012	60	0	36	0	24
2013	73	0	44	0	29
2014	76	1	45	4	26
2015	82	19	46	5	12

Table 3. Performance Metrics for Hospitals Participating in GWTG-Stroke in Illinois

Year	Median Door-to-Needle Times (minutes)	% DTN times ≤ 60 min	Discharge to Home
2009	85	18%	38.0%
2010	84	18.5%	36.8%
2011	81	26.1%	32.9%
2012	73	33.9%	43.8%
2013	63	47.4%	45.4%
2014	56	60.9%	45.3%
2015	56	62.4%	44.1%

Figure 1. Arrival Mode of All Hospitals Participating in GWTG-Stroke in Illinois.



36-41% of patients arrived by EMS from home/scene
31-36% of patients arrived by private transportation

DTN times for IV Alteplase went from 85 minutes in 2009 to 56 minutes in 2015, a 34% relative decrease
P< 0.0001

Percent of patients with DTN times of 60 minutes or less increased from 18% in 2009 to 63% in 2015
P < 0.0001

Limitations

- Data are limited to GWTG facilities
- Definite causation between the stroke legislation and these results cannot be firmly established, as other changes in patient care might have accounted for some or all of these changes
- An increase in the number of certified stroke centers may have also played a role in the improved care metrics
- The definitions for discharge destinations changed during the course of the study

Conclusions

- Illinois observed a clear and significant improvement in several care metrics for patients with acute ischemic stroke
- These changes occurred after the passage of state legislation related to the identification of stroke centers and routing of stroke cases
- This experience is a good example of stakeholders working in a cooperative manner to improve stroke care on a state level

For more information, contact Kathleen O'Neill at kathleen.oneill@heart.org

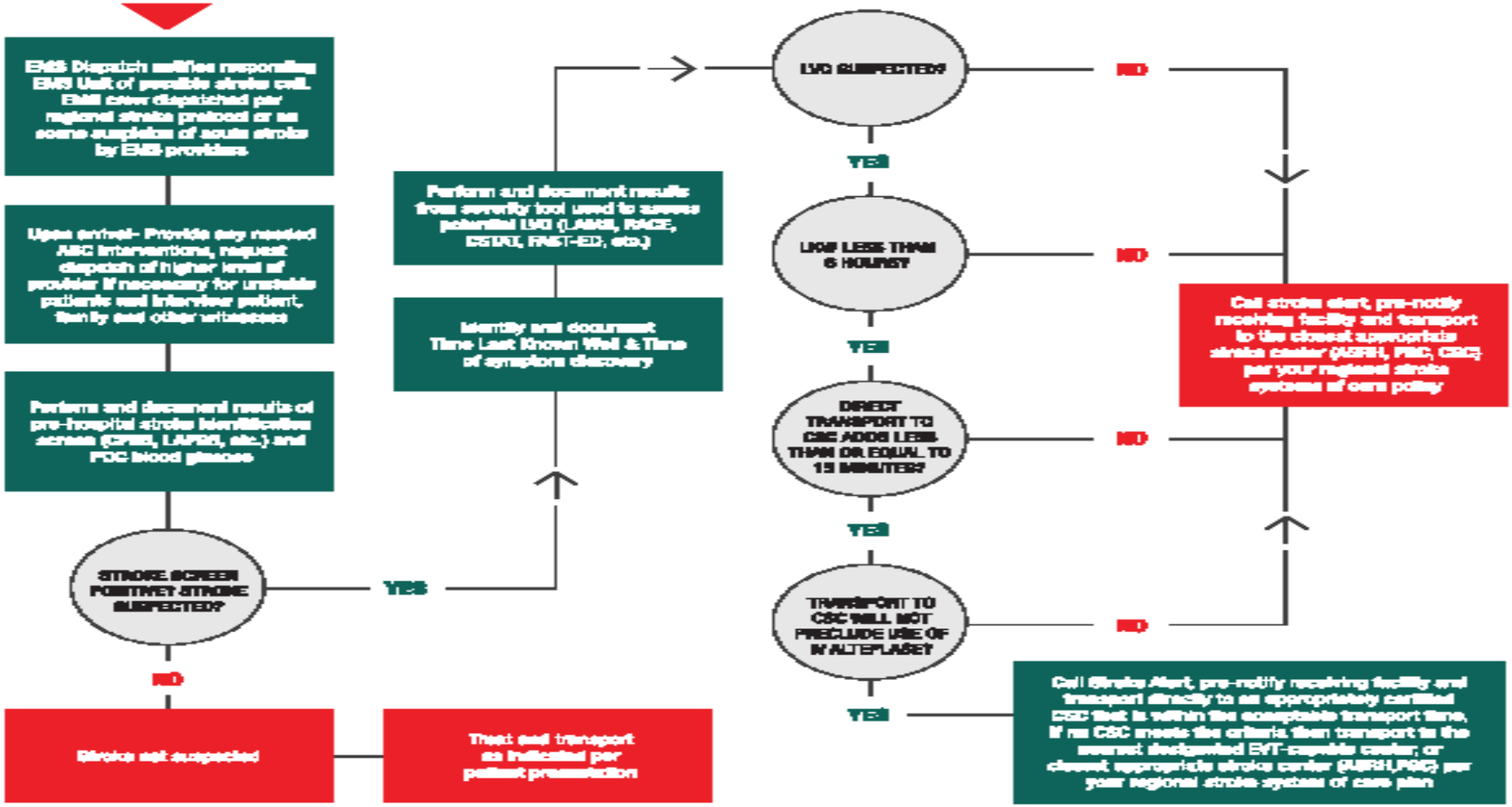
Quintiles is the data collection coordination center for the AHA/ASA Get With The Guidelines® programs

Dr. Alberts is a speaker for Genentech, which markets Alteplase

How Will it Work? EMS Protocols

- The IN Dept. of Homeland Security and the IN EMS Commission will lead the process to draft stroke protocols based on national guidelines, as well as efforts to educate and train EMS MDs and EMS agencies between now and July 1, 2018
- The American Heart Association & American Stroke Association will provide information and assistance, including the Severity-Based Stroke Triage Algorithm for EMS which was released at the International Stroke Conference earlier this year

SEVERITY-BASED STROKE TRIAGE ALGORITHM FOR EMS



ON SCENE

- Interview patient, family members and other witnesses to determine Last Known Well (LKW) time and time of symptom Discovery.
- Attempt to identify possible stroke mimics (eg. seizure, migraine, intoxication) and determine if patient has pre-existing substantial disability (need for nursing homecare or inability to walk without help from others).
- Encourage family to go directly to Emergency Department if not transported with patient and obtain mobile number of next of kin and witnesses.
- If Mobile Stroke Unit available—follow Mobile Stroke Unit Protocol.
- Each EMS agency should utilize a published and validated stroke screen to assess patients with non-traumatic onset of focal neurologic deficits and validated tool to assess possible Large Vessel Occlusion (LVO).
- Patients who are eligible for IV Alteplase if transported to nearest Acute Stroke Ready Hospital (ASRH) or PSC should not be recruited to a CSC or EVT-capable Center if doing so would result in a delay that would make them ineligible for IV Alteplase.
- Collect a list of current medications (especially anticoagulants) and obtain patient history including co-morbid conditions (eg. cerebral kidney or liver disease), recent surgery, procedures or stroke) that may impact treatment decisions.

How Will it Work? Hosp. Designation

- The Indiana Dept. of Health will create and maintain a regularly updated list of Comprehensive Stroke Centers, Primary Stroke Centers, and Acute Stroke Ready Hospitals, and will update the IN Dept. of Homeland Security promptly of any change in hospital certification status
- Hospitals wishing to be included on the certified stroke center list would send the Dept. of Health proof of their current certification as a CSC, PSC, or ASRH from a national certifying body (such as the Joint Commission, HFAP, DNV, etc.) on a rolling basis
- Hospitals wishing to be included on the network hospital list would send the Dept. of Health a copy of their transfer agreement/s with certified stroke centers

How Will it Impact Hospitals?

- Hospitals certified at the CSC, PSC, or ASRH level would largely continue business as usual, with possibly increased EMS-transported patient flow
- While the decision to become certified as a CSC, PSC, or ASRH may impact EMS patient flow, there would be no statutory requirement for hospitals to become certified
- If an area had no certified stroke centers, transport may be unaffected
- The IN State Office of Rural Health and the IN Rural Health Association may be able to provide federal flex funds to help would-be ASRH centers achieve that level of care

Questions?

Thanks for your time!

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