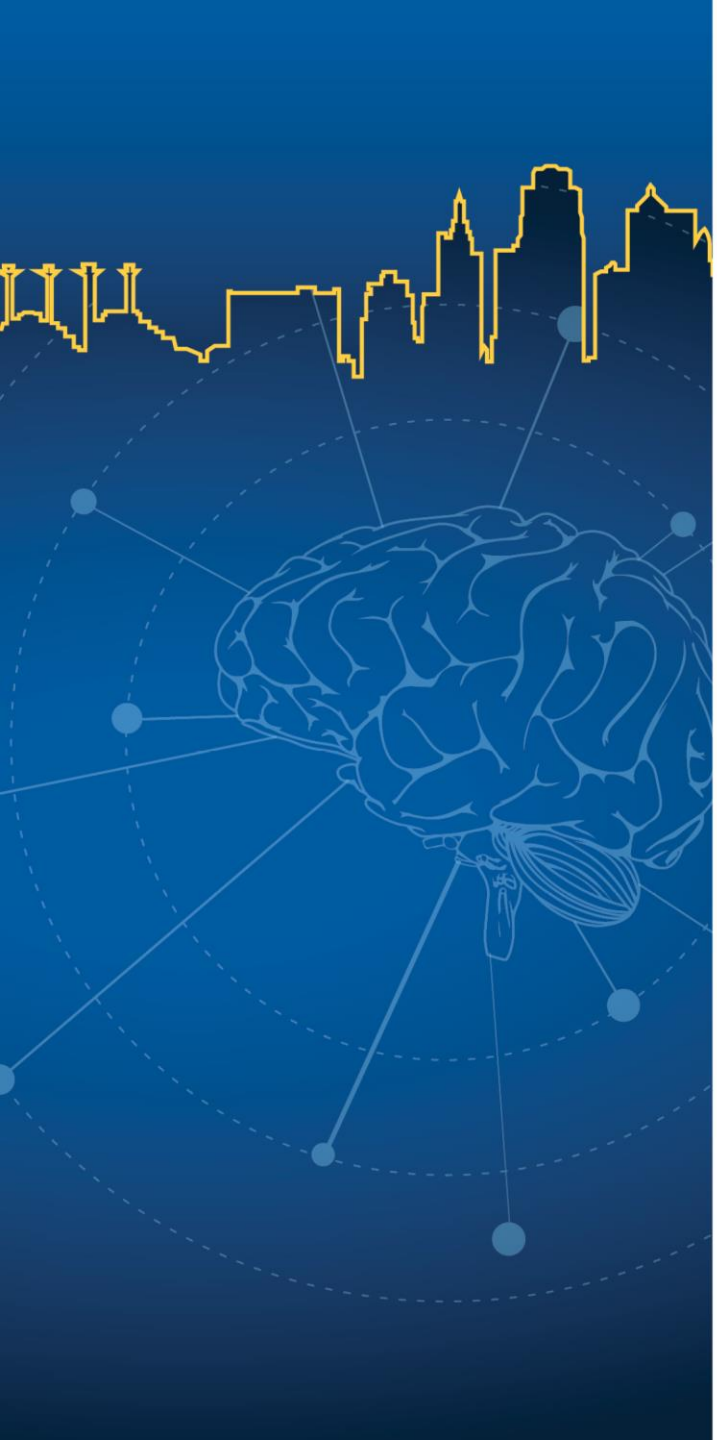

Effective Systems of Stroke Care

Presented by:

Angela Hawkins

MSN, RN, CCRN, CNRN, SCRN

System Stroke Program Manager

at

AHA 19th Annual Bistate Stroke Conf

The Ritz Charles

November 3, 2017

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Disclosures

- Nothing to Disclose

Objectives

- Identify new paradigms in stroke care to guarantee successful system program management and effective use of resources

- Define ways to enhance collaboration with referring centers to help streamline processes in stroke within a region or city.

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Saint Luke's Health System

KANSAS CITY, MISSOURI

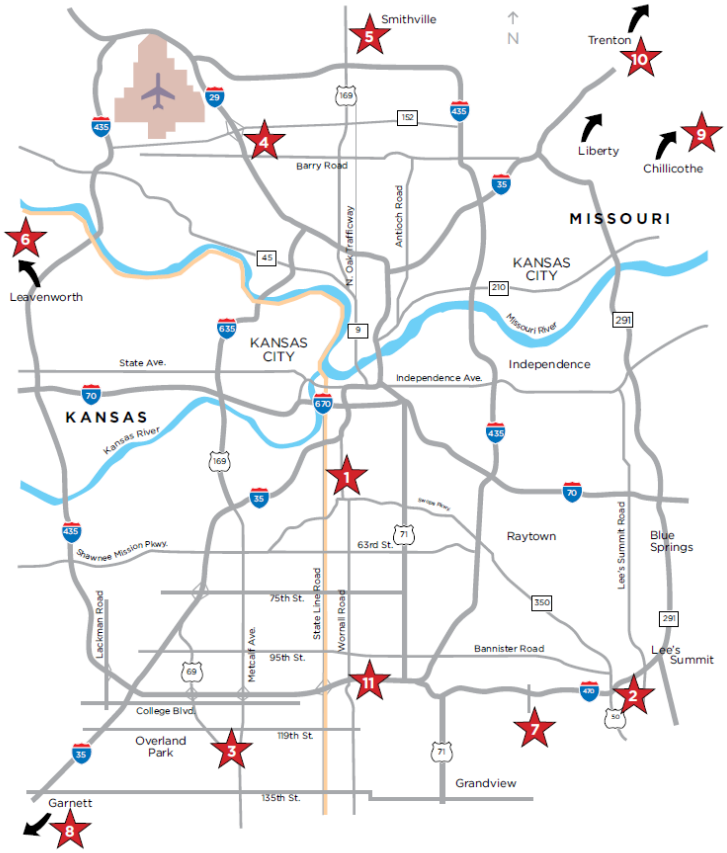
9 hospitals

1 hospice house

1 children's psychiatric facility

Saint Luke's Physician Specialists

Saint Luke's Medical Group



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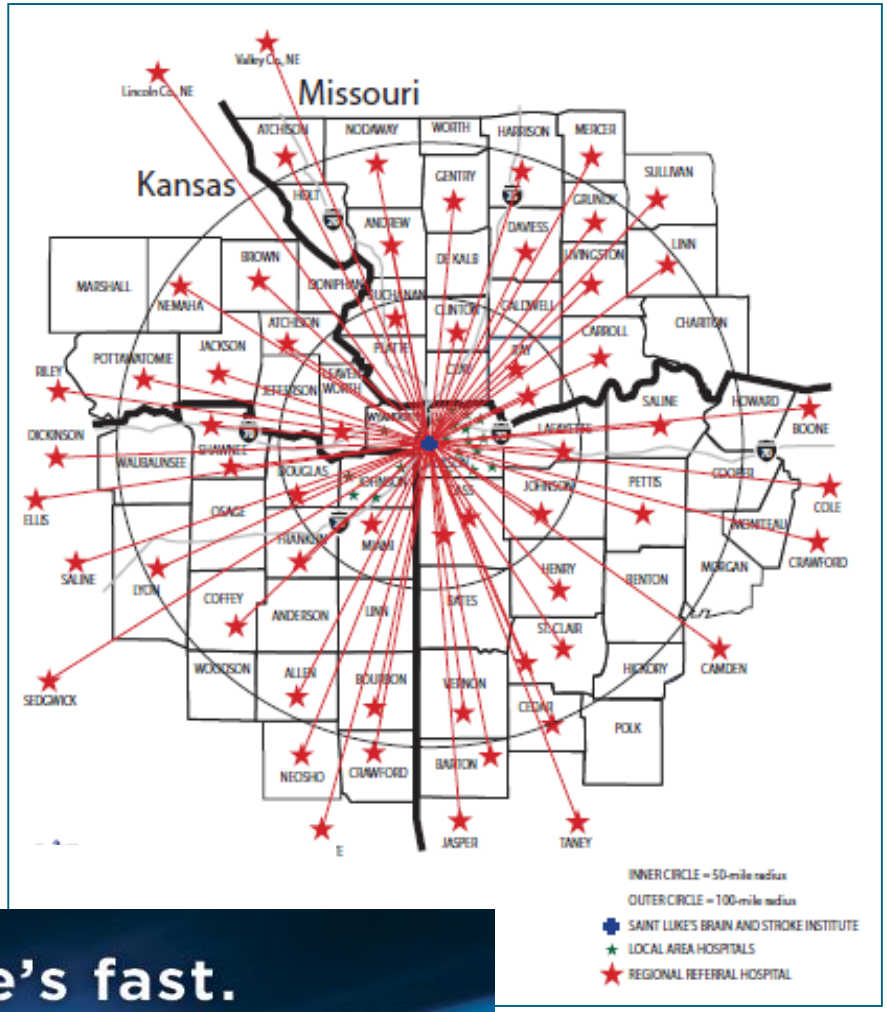
Target Stroke Population

KANSAS CITY, MISSOURI

- Primary Service Area (PSA) – 50 mile radius
  - 2016 PSA stroke discharges: greater than 5,000
  - SLH market share: 14.1%
- Secondary Service Area (SSA) – 150 mile radius
  - 2016 SSA stroke discharges: greater than 10,000
  - SLHS market share: 21.9%



In stroke care, there's fast.
Then there's *Saint Luke's fast.*

SYSTEM OF CARE INITIATIVE

Background

- In 2015, the standard of care for acute stroke due to large vessel occlusion became endovascular therapy.
- In the United States hospitals of varying stroke treatment capabilities competed for patients resulting in uneven care of this vulnerable population.
- Within Kansas City, we have developed an efficient model for stroke systems of care that optimizes resources to improve routing of stroke patients to the appropriate stroke hospital and decreases times delays in the much needed treatment that stroke patients need to receive.

Goals

We sought to

- Communicate more effective practices for better door to door times
- Improve EMS transport times
- Better delineate stroke treatment
- Enhance collaboration of referring hospitals that result in improved clinical outcomes

ASA Guidelines

AHA/ASA Guideline

2015 AHA/ASA Focused Update of the 2013 Guidelines for the Early Management of Patients With Acute Ischemic Stroke Regarding Endovascular Treatment

A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists.

Endorsed by the American Association of Neurological Surg

Neurological Surgeons (CNS); AANS/CNS Cerebrovascular S

Neuroradiology; and Society of Vascular and Interve

William J. Powers, MD, FAHA, Chair; Colin P. Derdeyn, M

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American Heart Association Stroke Co

AHA/ASA Guideline

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ASA Policy Recommendations

Recommendations for the Establishment of Stroke Systems of Care

Recommendations From the American Stroke Association's Task Force on the Development of Stroke Systems

Task Force Members

Lee H. Schwamm, MD; Arthur Pancioli, MD; Joe E. Acker III, EMT-P, MPH, MS; Larry B. Goldstein, MD; Richard D. Zorowitz, MD; Timothy J. Shephard, PhD(c), CNRN, CNS; Peter Moyer, MD, MPH; Mark Gorman, MD; S. Claiborne Johnston, MPH, MD, PhD; Pamela W. Duncan, PhD; Phil Gorelick, MD; Jeffery Frank, MD; Steven K. Stranne, MD, JD; Renee Smith, MPA; William Federspiel, BA; Katie B. Horton, RN, JD; Ellen Magnis, MBA; Robert J. Adams, MD

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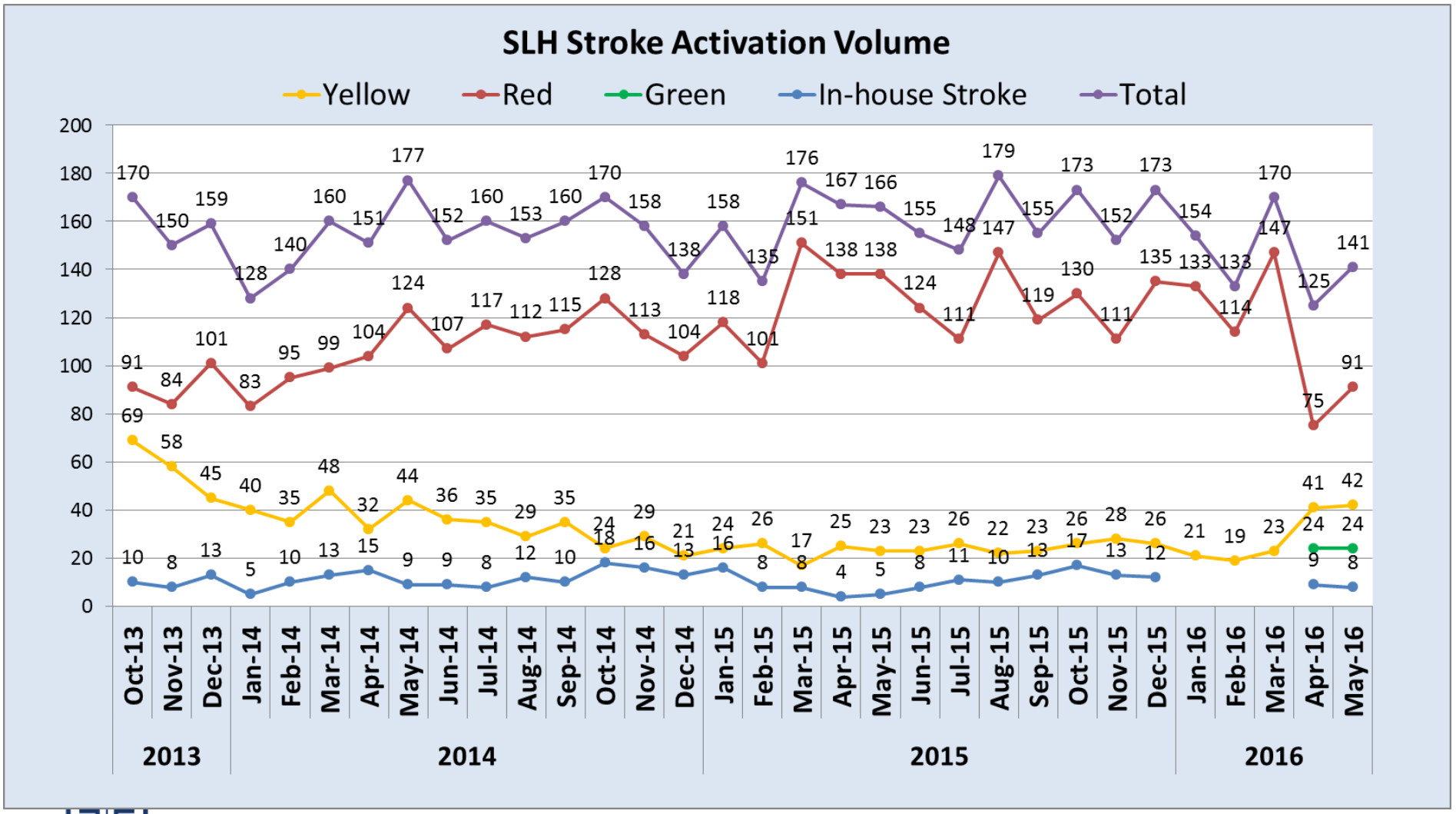
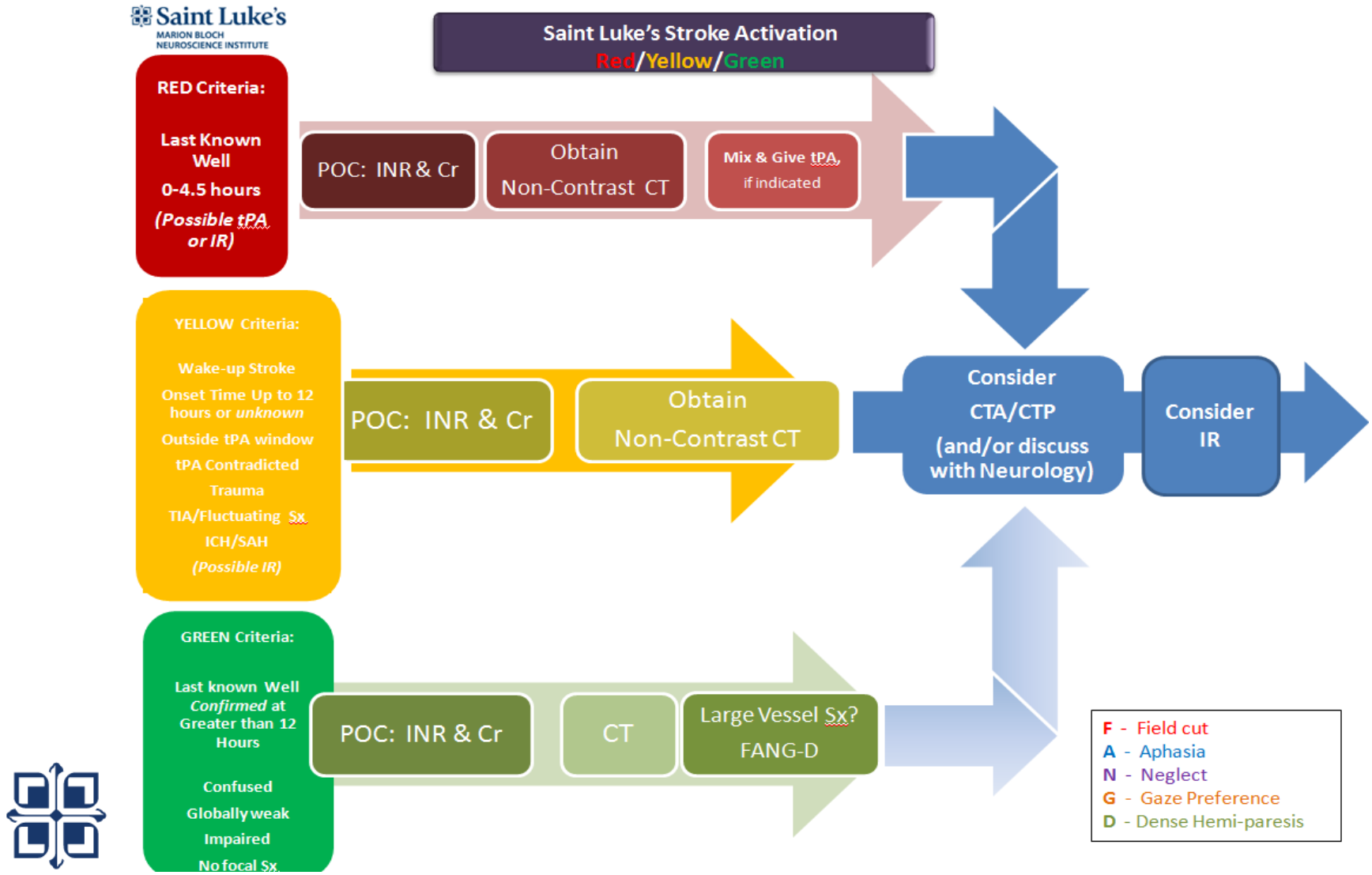
SLH Stroke Activation

KANSAS CITY, MISSOURI



Code Stroke: The Tiered Triage Approach



Saint Luke's Stroke System Goals

Goal: Target Stroke Initiative

- 75% of tPA in 45 minutes or less!!

Goal: Initiate Procoagulant within 15 minutes of CT result

Goal: Transfer Initiative

- 75% of Stroke Transfers Door to Door of 60 minutes or less

Methods

- Utilize routing protocols to give guidance for EMS and non-comprehensive stroke centers to optimize resources that facilitate transport of stroke patients to the appropriate hospital
- Systemize pre-hospital requirements to aid in 60 min door in and door out times
- Request prompt follow-up reports for EMS on stroke transfers

Methods

- Develop algorithms that include preferential shipping of patients to PSC or CSC, or ASRH to PSCs/CSCs
- Recognize Pre-hospital notification as *important*
- Require an efficient Code Neuro/Stroke Team
- Set PI Goals and make sure the Team knows them!

Methods

- Load radiology images into a cloud environment for remote viewing of images obtained at Acute stroke ready or primary stroke centers
- Pay careful attention to time metrics in the PSC to help aid rapid transport to the CSC
- Give consultative comments, not criticisms

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Saint Luke's System Plan for Transfers

KANSAS CITY, MISSOURI

Results

- Mean door to recanalization rates decreased from 224 minutes in 2013 to 86 minutes in 2016. National data was benchmarked at greater than 120 minutes.

- Stroke treatment rates for tPA increased from 19.8% in 2013 to 22.7% in 2016, (national rates are averaging around 10%) and endovascular treatment rates of 14.6% to 18.1% in the same time period (national rates currently at 2.7%).

- Conversely, complication rates from stroke treatment declined within the same period from 7.4% to 1.4%. (National complication rates are 7.0% for same period.) Risk adjusted mortality decreased and symptom onset to reperfusion of vessel times decreased.

Stroke Treatment Rates

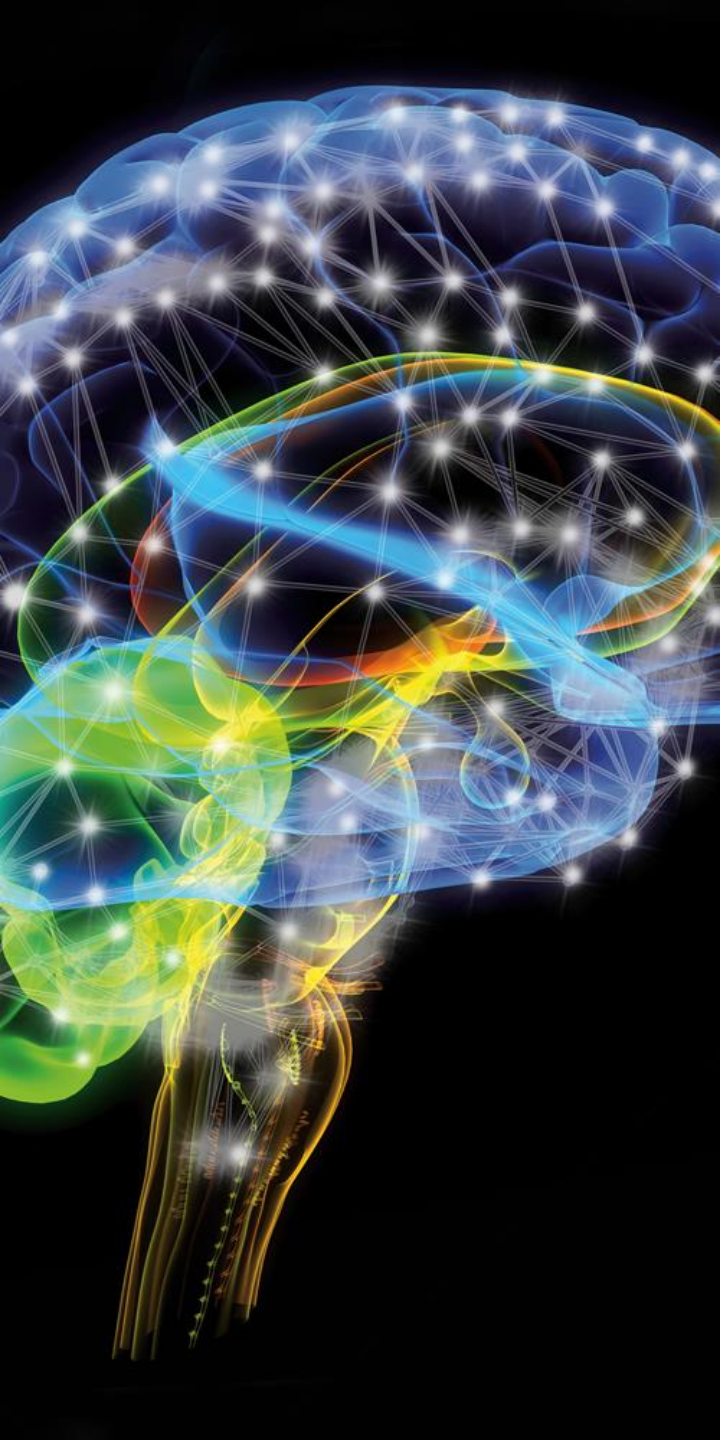
Stroke Treatment	SLH 2014	SLH 2015	SLH 2016	National	Regional
tPA	19.8%	22.0%	22.7%	13.2%	17.6%
Endovascular Treatment	14.6%	14.6%	18.1%	2.7%	4.6%
Combined	34.4%	36.6%	40.8%	15.9%	22.4%

SLH treats stroke patients
2 ½ times more than the National Average

Complication Rates

Nonsurgical Complication Rates (%)	SLH 2015	SLH 2016	National	Regional
Bleed Rate after tPA	0.0%	0.0%	3.0%	2.8%
Bleed Rate after Endovascular Treatment	5.6%	1.8%	12.8%	6.5%
Total	3.8%	1.4%	7.0%	7.3%

Due to more efficient system processes and routing protocols, we are able to treat faster and with markedly improved outcomes.



A Case Study:

Systemizing Stroke Care

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Case Study

- 65 year old male patient was eating dinner at 1945 when he suddenly stopped talking and developed right sided flaccidity. His wife tried to get him into the car but he was unable to walk and slid to the ground.
- EMS was called and notified Emergency Department en route of stroke activation.
- Upon arrival to the ED patient was taken directly to CT. His NIH was 20 and there were no contraindications for tPA.
- Patient receive tPA at PSC facility

Case Study

- Patient Transferred: 2105
- **Door to Door: 51 minutes**
- Upon arrival to the CSC the NIH increased to 25 as stroke continued to evolve. CTA/P showed Left MCA infarct with considerable area of penumbra and fairly large core.
- The IR team was pre-activated and successful thrombectomy was achieved.

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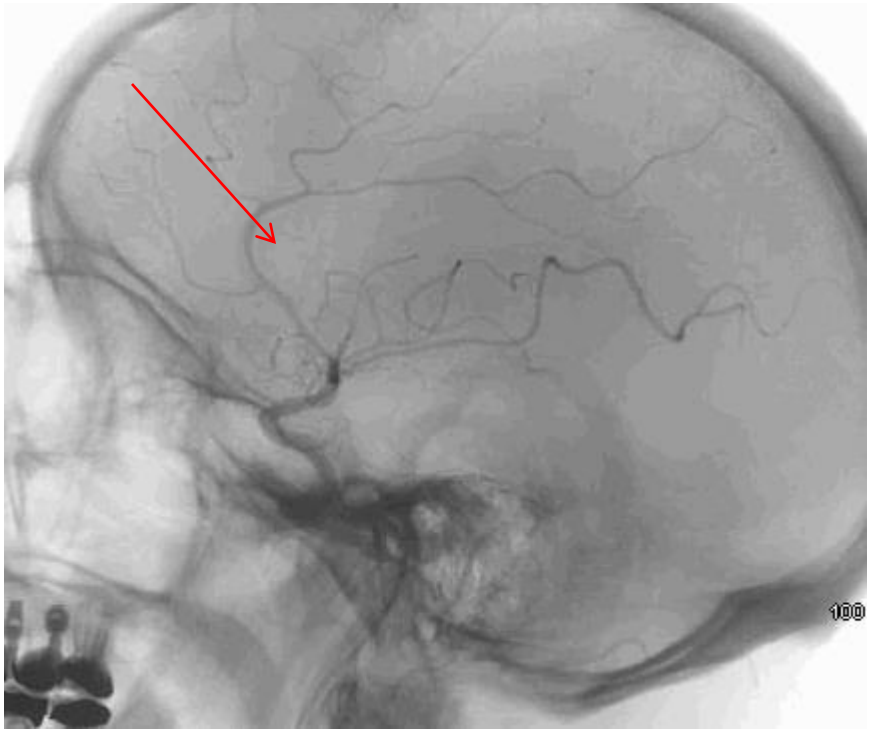
Case Study

KANSAS CITY, MISSOURI

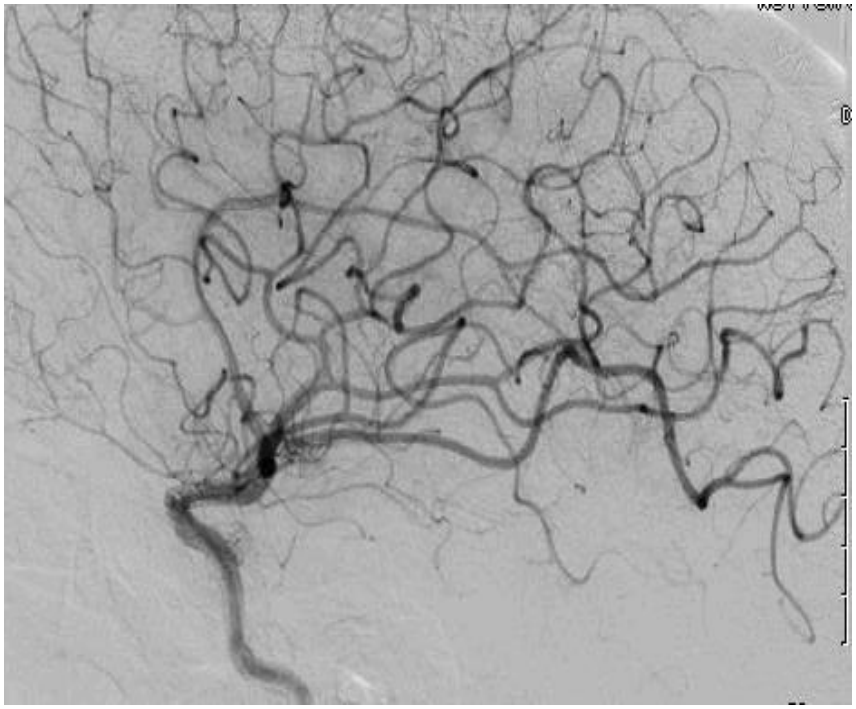
Action ***LKW= 19:45***	**Actual time** Arrived at 2014	**Minutes elapsed**	**Goal time** **in minutes**
ED arrival to Code Stroke activation	2009	PTA	**15**
Stroke team arrival	2014	0	**15**
ED arrival to CT head initiated	2016	2	**25**
ED arrival to initial doctor evaluation	2017	3	**10**
ED arrival to CT results	2035	21	**45**
Neurologist consulted	2038	24	**N/A**
CT results to tPA bolus	2037	2	**15**
ED arrival to tPA bolus	2037	23	**45**

Case Study: L MCA

Pre-Thrombectomy



Post-Thrombectomy



IR Thrombectomy

Case Study

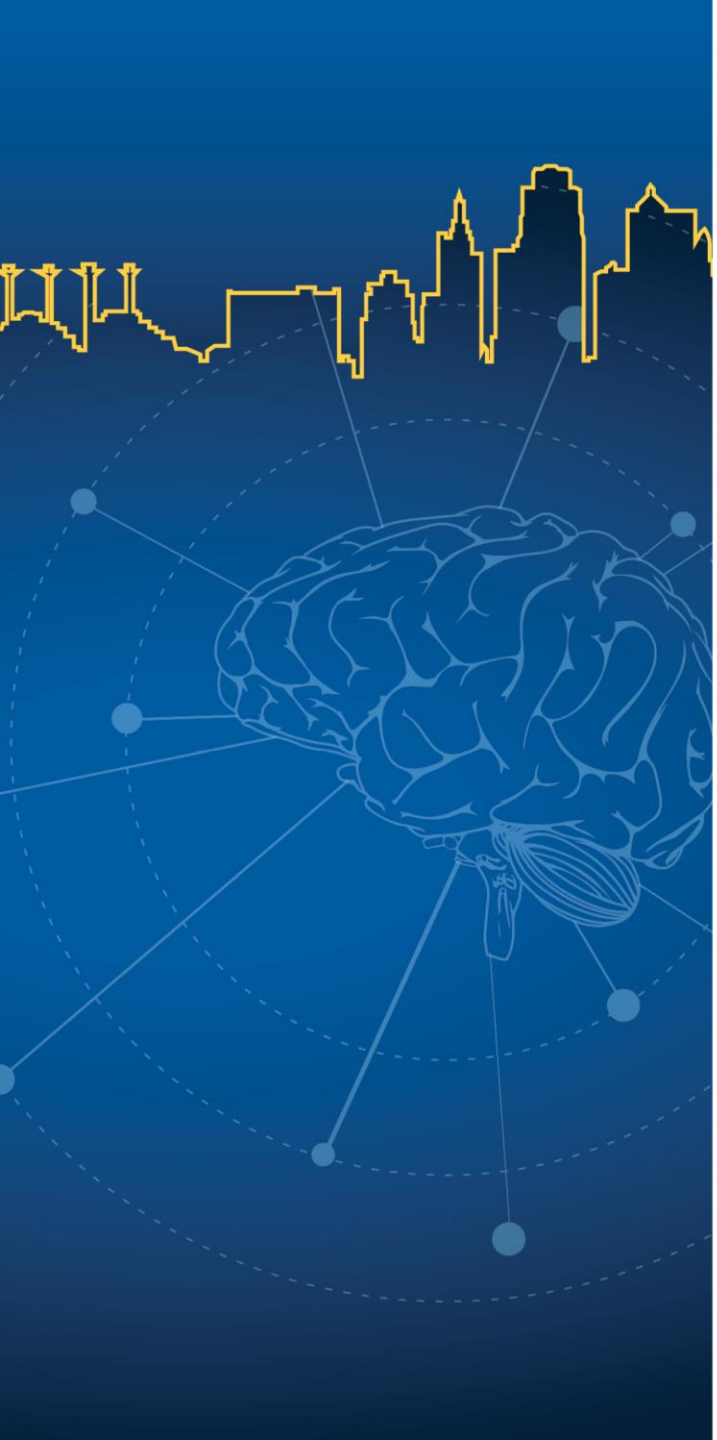
- Post intervention he had some improvement in his symptoms, at 24 hours and continued to have right sided arm > leg weakness, droop, and minimal expressive aphasia.
- His wife states he was able to eat using his right hand. Cardiac testing is ongoing as probable source of infarct.
- 24 hour NIH = 16.
- Discharge NIH (to Rehab) = 8

Results

- Risk adjusted mortality can decrease
- Thrombolytic complications in intravenous and endovascular patients can decrease
- **Treatment rates can increase**
- Symptom onset to reperfusion of vessel times can decrease

Conclusion

- Implementation of field to hospital and hospital to hospital routing protocols is associated with improved clinical outcomes.
- Collaborating with referring ASRHs and PSCs on best practices results in a consistent stroke work-up process that is more streamlined aids the CSC
- Positive process changes in referring centers sets a higher bar for time metrics, and pushes the CSC to higher standards



Questions?

Thank you!

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