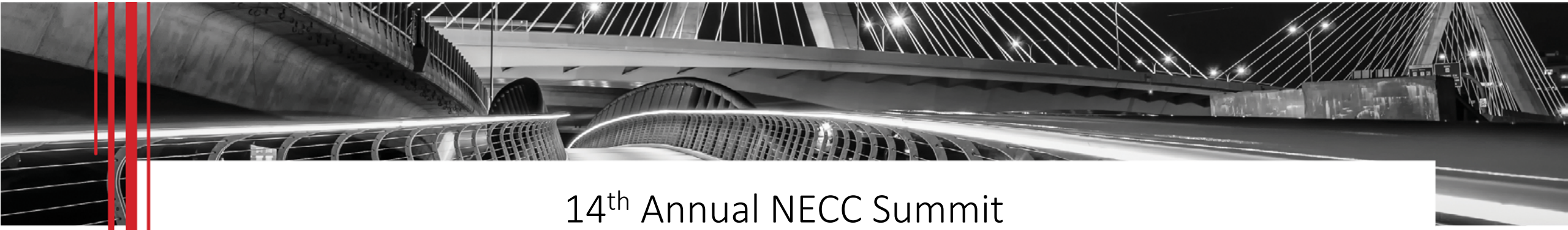


14th Annual NECC Summit
Thursday, October 24th

State Stroke Systems of Care Updates: NJ Breakout Session

Mark Merlin, DO, EMT-P, FACEP

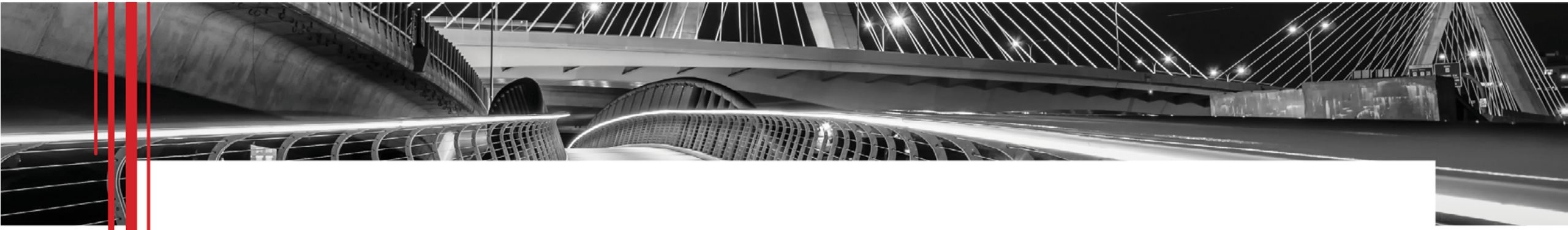
Medical Director, Chair, NJ EMS Council, NJ Department of Health

Disclosures

- No disclosures

Agenda

- Audience Survey
- GWTG-Stroke Data Review
- Opportunities to Improve Stroke Systems of Care:
  - Update on Statewide Stroke Severity Scale
  - Imaging Readiness Assessment Survey
- Discussion / Q&A



Audience Survey

Show of hands…

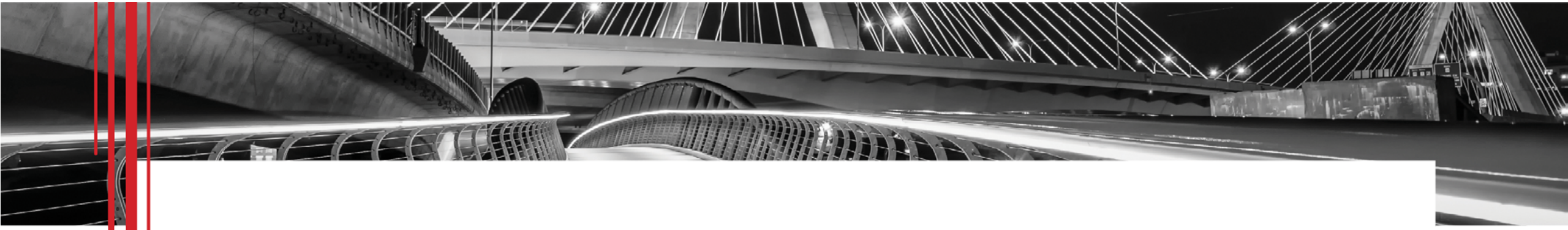
Who is a:

- Physician – Neurologist?
- Physician – Emergency Medicine?
- Physician – Other?
- Stroke Coordinator?
- Staff Nurse?
- EMS Professional – ALS?
- EMS Professional – BLS?
- Other?

Show of hands…

Who is from a:

- State Designated Comprehensive Stroke Center?
- State Designated Primary Stroke Center?
- The NJ Department of Health?



GWTG-Stroke Data Review

The NorthEast Cerebrovascular Consortium
EST. 2006
NECC

Preview of GWTG-Stroke Data

- Stroke Diagnosis Type
- Arrival Mode
- Last Known Well to ED Arrival Times
- Stroke Care Measures
  - Pre-notification by EMS
  - Door to CT ≤ 25 min
  - Ischemic Stroke patients who receive IA catheter-based reperfusion
  - Time to IV tPA – 60 min
  - Time to IV tPA – 45 min

Notes:

- This data includes only hospitals currently enrolled in GWTG-Stroke. In NJ, 76% of acute care hospitals participate in GWTG-Stroke.
- EMS data in GWTG-Stroke is a reflection of hospital documentation of pre-hospital care, and may not be a true reflection of care provided by EMS.
- The Northeast region benchmarking group includes the 8 NECC states and Pennsylvania

Stroke Diagnosis Type
by Region
% of patients (number of patients)

GWTG Data:
Ie, hospitals currently enrolled in GWTG-Stroke

Stroke Diagnosis Type	Region			
	NJ 2013	NJ 2018	Northeast 2018	Nation 2018
Ischemic Stroke	58.9% (9,326)	63.1% (11,492)	64.6% (87,551)	68.8% (440,929)
TIA	23.2% (3,669)	20.8% (3,790)	16.9% (22,924)	11.8% (75,439)
Subarachnoid Hemorrhage	3.6% (566)	3.6% (662)	3.6% (4,940)	3.7% (24,009)
Intracerebral Hemorrhage	10.0% (1,589)	11.1% (2,029)	10.8% (14,669)	11.3% (72,313)
Stroke, not otherwise specified	0.7% (103)	0.2% (31)	0.3% (454)	0.9% (5,611)
Total cases in GWTG	15,835	18,217	135,618	640,946

Compare to NJASR Data:
Ie, hospitals with State Stroke Designation

Stroke Diagnosis Type	
	NJASR 2018
Ischemic Stroke	62.0% (14,248)
TIA	22.1% (5,071)
Subarachnoid Hemorrhage	3.5% (801)
Intracerebral Hemorrhage	10.1% (2,325)
Stroke, not otherwise specified	1.2% (278)
Total cases in NJASR	22,991

- Cases with a “missing diagnosis”, “no stroke related diagnosis” or “elective carotid intervention only” are not listed here, therefore the sum of the number of patients within each diagnosis may not equal the “Total cases in GWTG” for each region.

Arrival Mode
by Region
% of patients (number of patients)

Arrival Mode	Region			
	NJ 2013	NJ 2018	Northeast 2018	Nation 2018
EMS from home/scene	40.9% (6,166)	51.4% (9,047)	50.8% (63,924)	44.5% (270,627)
Mobile Stroke Unit	0% (0)	0% (6)	0.1% (163)	0.1% (747)
Private transport/ taxi/other from home/scene	32.7% (4,935)	38.5% (6,764)	32.9% (41,445)	34.2% (208,330)
Transfer from other hospital	4.8% (718)	9.2% (1,623)	15.3% (19,246)	19.1% (116,168)
Not documented or unknown	0.9% (143)	0.8% (137)	0.8% (966)	0.6% (3,898)
Total N	15,077	17,588	125,903	608,471

- Mobile Stroke Unit was added as a unique response option in 2017
- Cases with a "blank" for Arrival Mode are not listed here, therefore the sum of the number of patients for each arrival mode may not equal the "Total N" for each region.

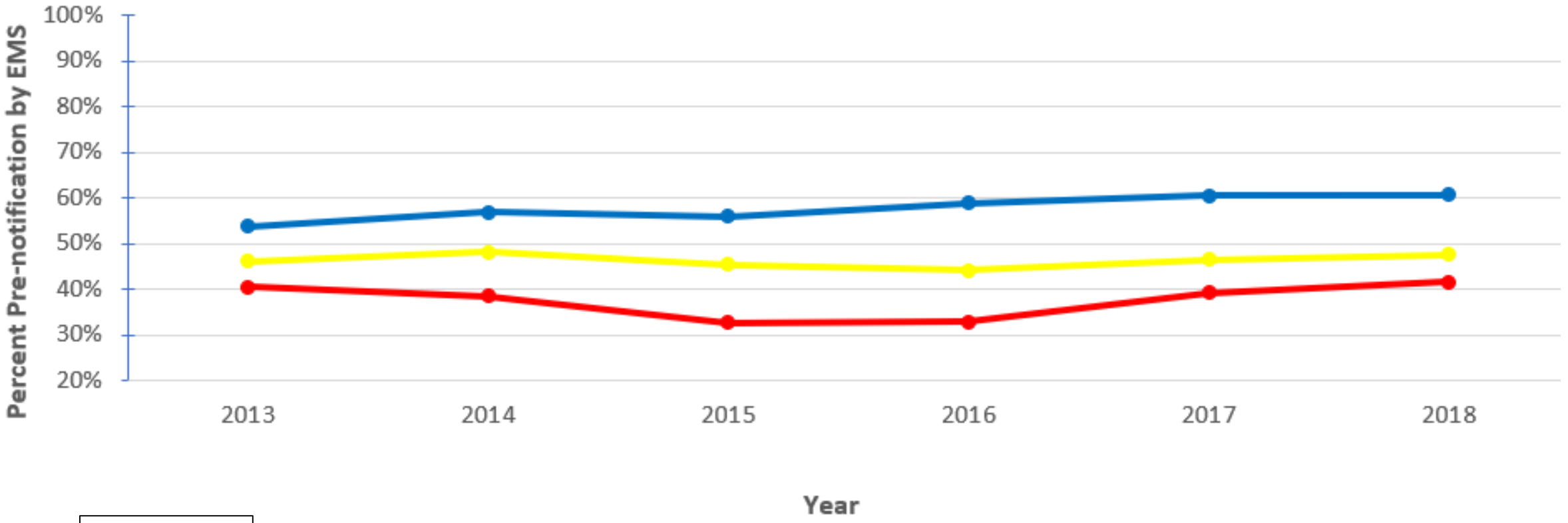
Last Known Well to Arrival Times
(for patients who arrive via EMS or MSU from home/scene)
by Region
% of patients (number of patients)

Last Known Well to Arrival Time Group	Region			
	NJ 2013	NJ 2018	Northeast 2018	Nation 2018
0-30 min	2.7% (163)	3.3% (295)	3.6% (2,300)	4.4% (11,731)
31-60 min	13.8% (845)	13.4% (1,200)	12.4% (7,896)	13.1% (35,217)
61-120 min	14.2% (864)	14.8% (1,317)	14.2% (8,996)	13.7% (36,775)
121-180 min	6.1% (371)	5.9% (529)	6.0% (3,814)	6.0% (16,075)
181-540 min	15.2% (926)	14.0% (1,254)	13.8% (8,766)	13.5% (36,297)
>540 min	16.3% (998)	15.5% (1,387)	15.4% (9,813)	15.4% (41,505)
LKW or Arrival Time unknown, or Arrival ≥ 2 days after LKW	33.9% (2,076)	34.2% (3,057)	36.0% (22,902)	35.1% (94,278)
Total N	6,119	8,938	63,667	26,866

- Cases with documented arrival and LKW time, and LKW to arrival ≥ 2 days, will be included in both the “>540 min” and “LKW or Arrival Time unknown, or Arrival ≥ 2 days after LKW” categories.

Pre-notification by EMS, 2013-2018

(For patients who arrive by EMS from home/scene),
by Region



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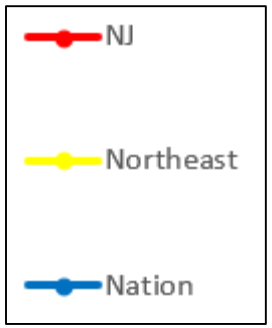
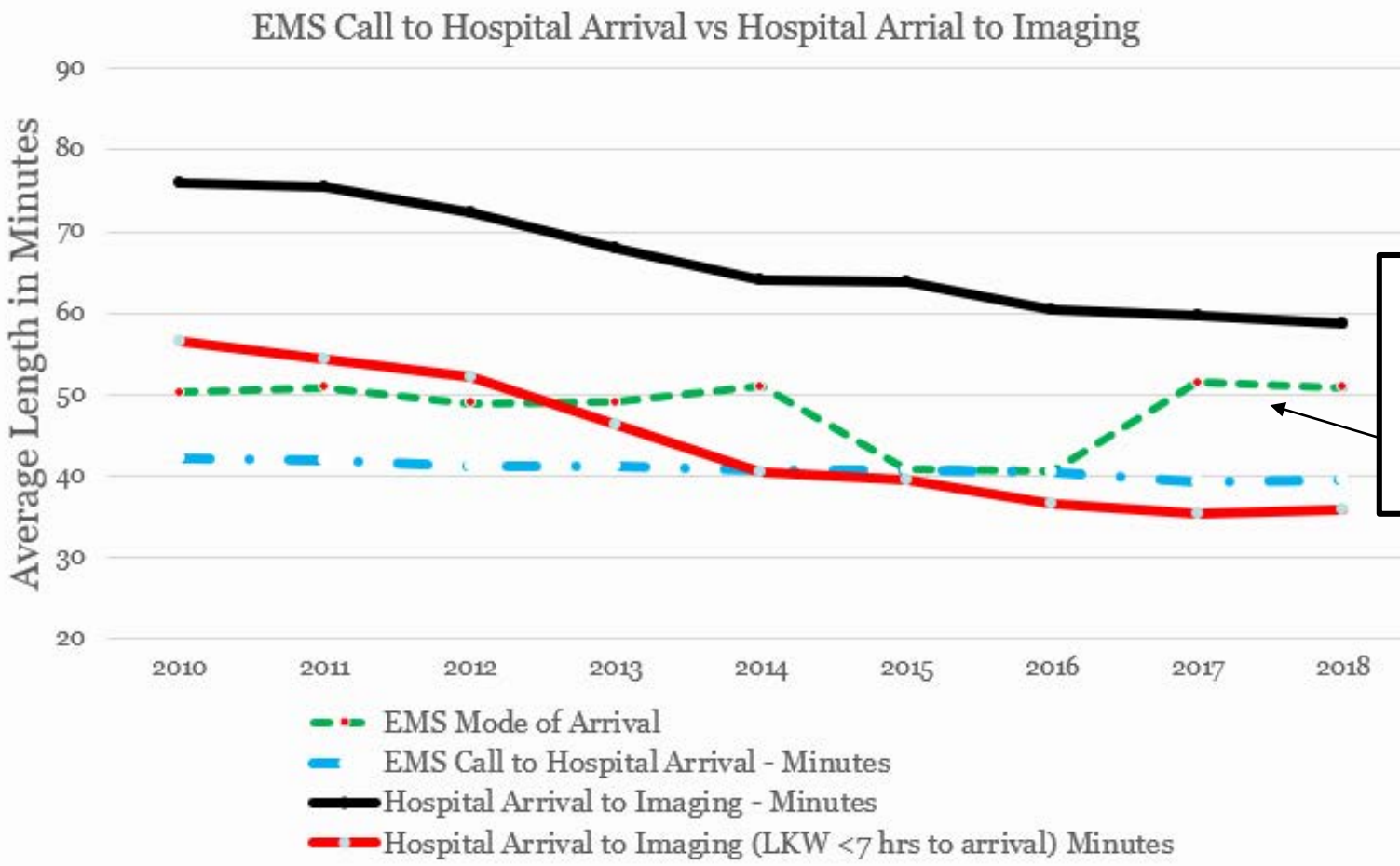


Additional Data from NJASR:

Ie, hospitals with State Stroke Designation

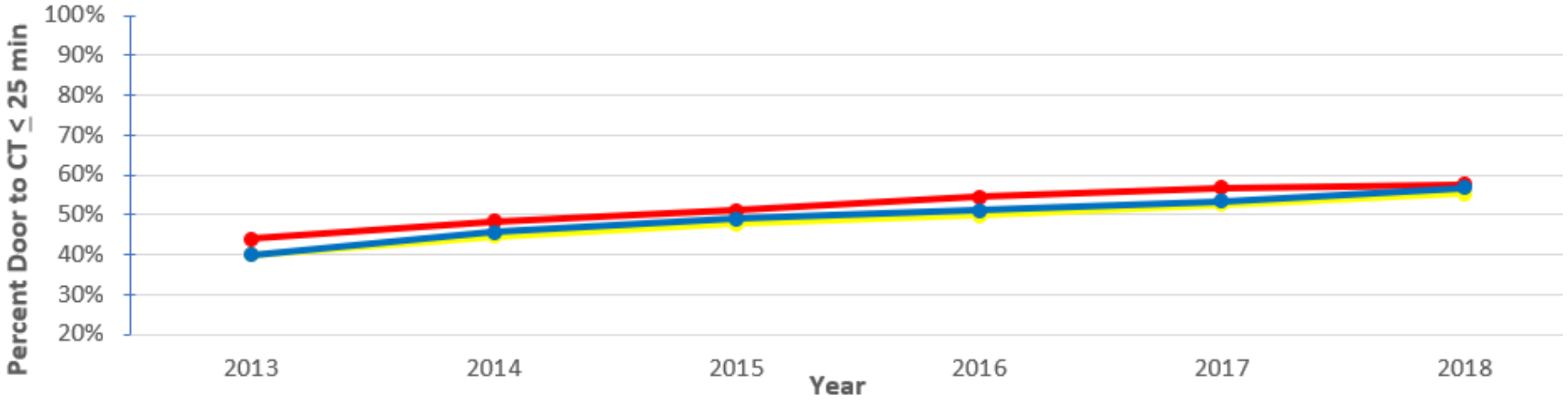
Mode of Arrival, EMS Call to Hospital Arrival and Hospital Arrival to Imaging



"EMS Mode of Arrival", in %

NJ Department of Health

Door to CT ≤ 25 min, 2013-2018
(For patients who arrive by EMS from home/scene),
by Region



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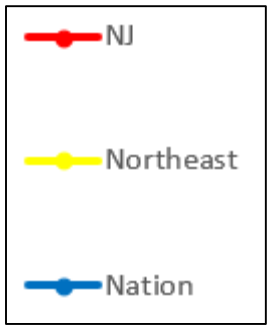


IV alteplase and IA catheter-based reperfusion

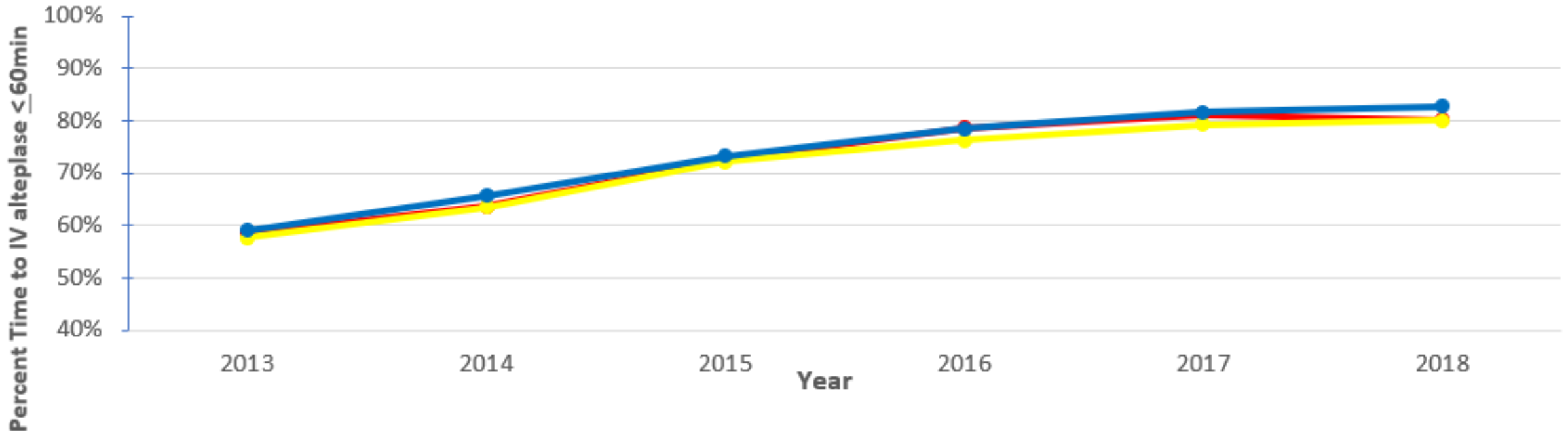
by Region

% of patients (number of patients)

Measure	Region			
	NJ 2013	NJ 2018	Northeast 2018	Nation 2018
Ischemic Stroke patients who received IV tPA (excluding patients with stroke after arrival)	9.2% (851)	12.1% (1,388)	10.5% (9,201)	11.7% (51,464)
Ischemic Stroke patients who received IA catheter-based reperfusion (excluding patients with stroke after arrival)	1.7% (154)	4.3% (498)	5.1% (4,424)	5.2% (22,866)

- IA catheter-based treatment includes both pharmacologic thrombolytic therapy and mechanical devices.
- Patients who receive IV tPA or IA catheter-based reperfusion at a non-GWTG hospital, who are subsequently transferred to a GWTG hospital, would not be captured in the measures for % of patients who received IV tPA, or IA catheter-based reperfusion.

Time to IV Alteplase ≤ 60 min, 2013-2018
by Region



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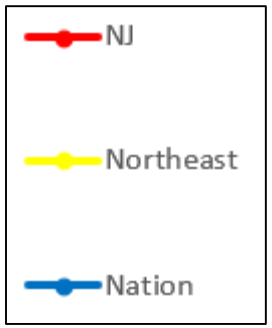
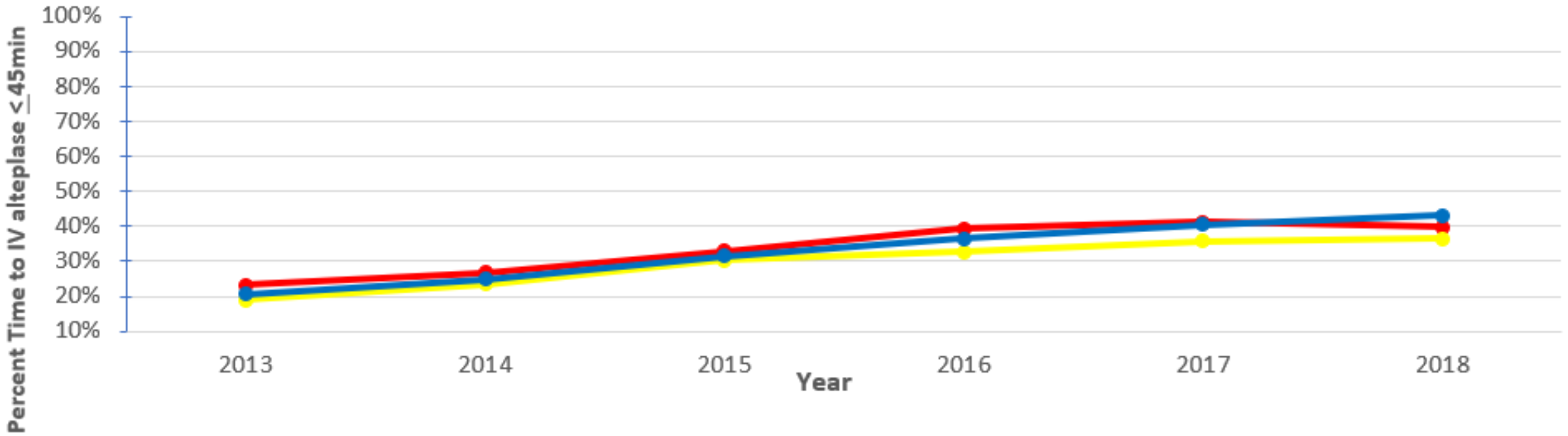


Time to IV Alteplase ≤ 45 min, 2013-2018
by Region



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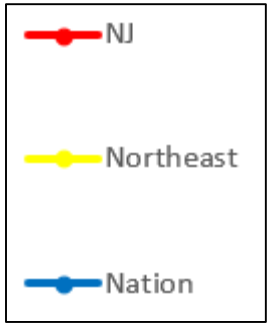


NATIONAL GOALS FOR PHASE III

PRIMARY GOALS

- Achieve door-to-needle times within 60 minutes in 85 percent or more of acute ischemic stroke patients treated with IV thrombolytics.
- Achieve door-to-device times (arrival to first pass of thrombectomy device) in 50% or more of eligible acute ischemic stroke patients within 90 minutes (for direct arriving patients) and within 60 minutes (for transfer patients) treated with endovascular therapy (EVT).

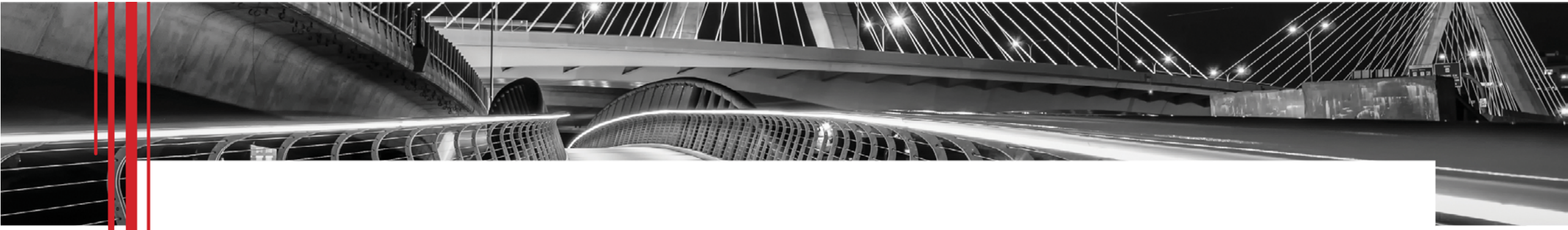
SECONDARY GOALS

- Achieve door-to-needle times within 45 minutes in 75 percent or more of acute ischemic stroke patients treated with IV thrombolytics.
- Achieve door-to-needle times within 30 minutes in 50 percent or more of acute ischemic stroke patients treated with IV thrombolytics.

From the AHA Target: Stroke Initiative:
New national goals for meeting DTN in 45 and 30 minutes

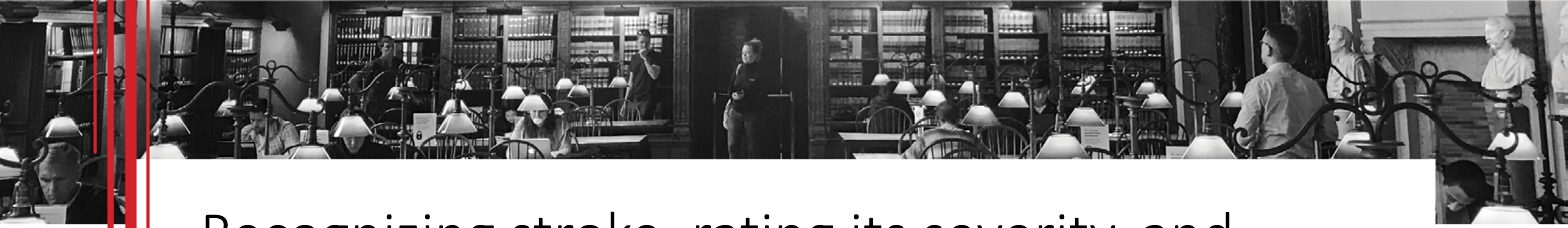
Discussion:

- What is your hospital doing to meet DTN within 45 minutes? 30 minutes?



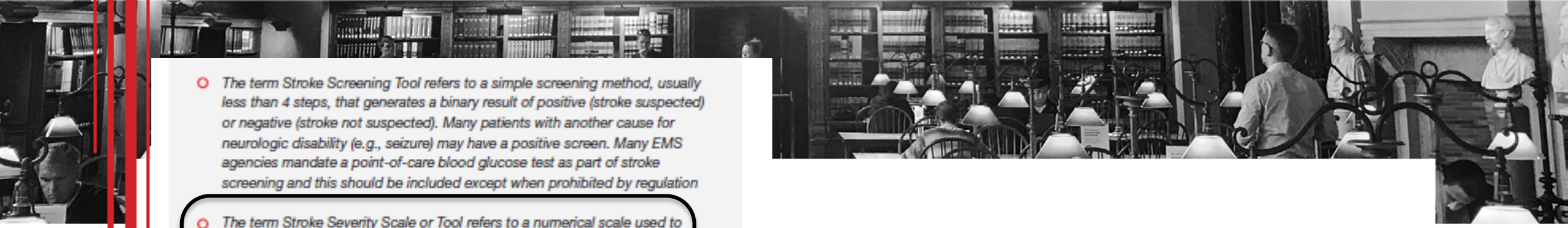
Opportunities to Improve Stroke Systems of Care:

Update on Statewide Stroke Severity Scale



Recognizing stroke, rating its severity, and transporting a patient to the proper hospital is a fundamental contribution EMS can make in stroke management.

Several prehospital stroke severity scales have been developed to help EMS do this.



- *The term Stroke Screening Tool refers to a simple screening method, usually less than 4 steps, that generates a binary result of positive (stroke suspected) or negative (stroke not suspected). Many patients with another cause for neurologic disability (e.g., seizure) may have a positive screen. Many EMS agencies mandate a point-of-care blood glucose test as part of stroke screening and this should be included except when prohibited by regulation*

- *The term Stroke Severity Scale or Tool refers to a numerical scale used to determine the severity of the neurologic deficits once a stroke is suspected in order to identify patients with severe symptoms due to LVO that may benefit from EVT. There are several available tools and no single tool has been shown to be superior. Each EMS region should choose a single screening tool and severity tool for use across all EMS providers. The following are the most popular tools available:*

STROKE SCREENING TOOLS

CINCINNATI PRE-HOSPITAL STROKE SCALE (CPSS)

LOS ANGELES PRE-HOSPITAL STROKE SCALE (LAPSS)

STROKE SEVERITY TOOLS

CINCINNATI STROKE TRIAGE ASSESSMENT TOOL (CSTAT)

FIELD ASSESSMENT STROKE TRIAGE FOR EMERGENCY DESTINATION (FAST-ED)

LOS ANGELES MOTOR SCALE (LAMS)

RAPID ARTERIAL OCCLUSION EVALUATION SCALE (RACE)

From the AHA/ASA Mission: Lifeline

"Severity-Based Stroke Triage Guidelines for EMS"

- *The term Stroke Severity Scale or Tool refers to a numerical scale used to determine the severity of the neurologic deficits once a stroke is suspected in order to identify patients with severe symptoms due to LVO that may benefit from EVT. There are several available tools and no single tool has been shown to be superior. Each EMS region should choose a single screening tool and severity tool for use across all EMS providers. The following are the most popular tools available:*

NJ Updates on Prehospital Stroke Severity Scale:

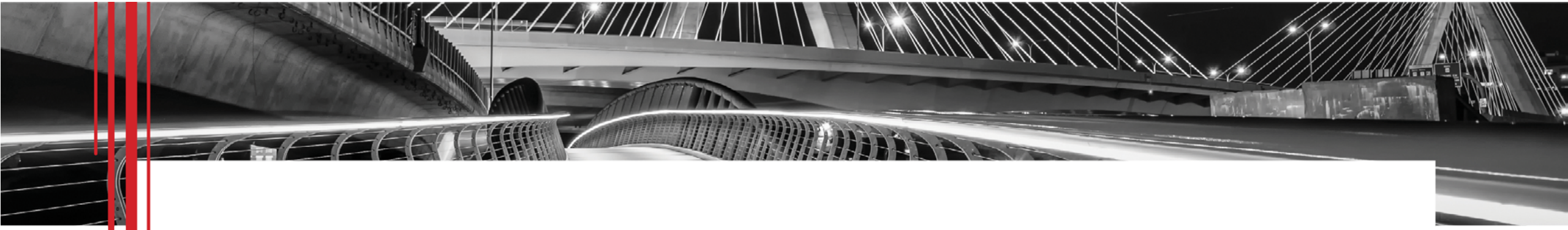
- NJ EMS and Medical leadership agreed a standard statewide stroke severity scale would be beneficial

- Chosen scale based on sensitivity/specificity, scale agencies are currently using, and ease of adding scale to current stroke identification processes

- Stroke Advisory Panel (SAP), NJ Stroke Coordinator Consortium (NJSCC) and NJ EMS Council agreed on “RACE Stroke Severity Scale” as statewide severity scale

NJ Updates on Prehospital Stroke Severity Scale:

- Multidisciplinary, collaborative workgroup has been developing RACE Scale training tools for EMS:
  - EMS and ED hardcopy education
  - A 5-minute highlight video
  - A 30-minute training video for EMS CEs



Opportunities to Improve Stroke Systems of Care:
Imaging Readiness Assessment Survey

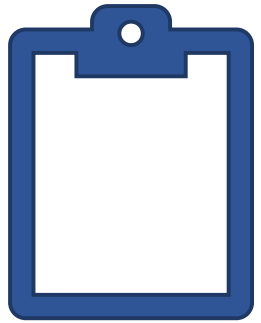
John Halperin, MD, FAAN, FACP, Neurologist

Chair, NJ Stroke Advisory Panel, NJ Department of Health

The NorthEast Cerebrovascular Consortium
EST. 2006
NECC

NJDOH: Imaging Readiness Assessment Survey

- NJ SAP assessed state stroke centers' readiness to implement care processes for LVO
  - State Stroke Centers: 53 Primary; 15 Comprehensive
- Survey sent to stroke coordinators:
  - Version 1 – launched June 27
  - Version 2 (simplified) – launched August 7
- Results available end of October



Preview of Preliminary Results

(45 responding hospitals from Version 1)

Thrombectomy: the challenges

	In NJ	Out of NJ
Transfer for thrombectomy	39	2

24 hour window	Yes	Under discussion	No answer
ED protocol changed			
Comprehensive	10		1
Primary	28	5	1
CTA available 24/7			
Comprehensive	11		
Primary	30		
CTA tech in house 24/7			
Comprehensive	11		
Primary	27	1	

Preview of Preliminary Results

(45 responding hospitals from Version 1)

CTA

Which patients?	n
All non-hemorrhagic, NIHSS 6+	19
All with acute stroke-like event	11
All acute ischemic stroke	7
All, even if shown to be hemorrhagic	2

Sequence?	n
Plain CT head, off table & evaluate, then CTA head, neck	16
Plain CT head, immediate CTA	15
Plain CT head, off table & evaluate, then CTA head	3

Preview of Preliminary Results

(45 responding hospitals from Version 1)

Core size - imaging

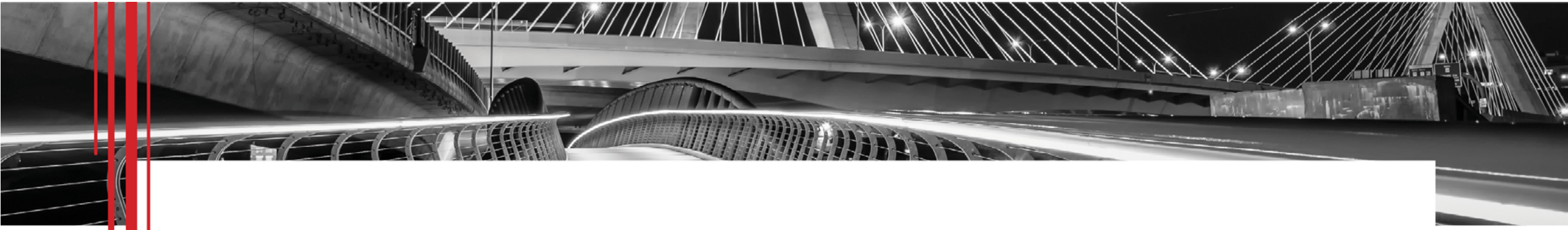
	Now	Plan (1-2 years)
CT perfusion	5	8
Automated, CT or MRI (e.g. RAPID)	5	5
CT ASPECTS	1	3
MRI DWI	2	0
Collaterals vs CTA	1	0
None	19	9

Preview of Preliminary Results

(45 responding hospitals from Version 1)

Biggest challenges to CTA rollout

	#1	#2
Changing ED protocols	17	9
Understanding goals, process for CTA roll out	11	15
Availability of scanners/technology	7	1
Radiology imaging/interpretation changes	3	9
Training CT technologists	0	3



Discussion / Q&A