
WELCOME TO THE
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WELCOME!

NECC 2019

Rhode Island Breakout

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Medical Director, RI DOH Center for EMS

Disclosures

No financial conflicts

Work at RIH

Employed by BPI / Brown Emergency Medicine

Life*PACT* Medical Director

RI DOH Center for EMS Medical Director

Immediate Past Chair, NASEMSO MDC

Like boats

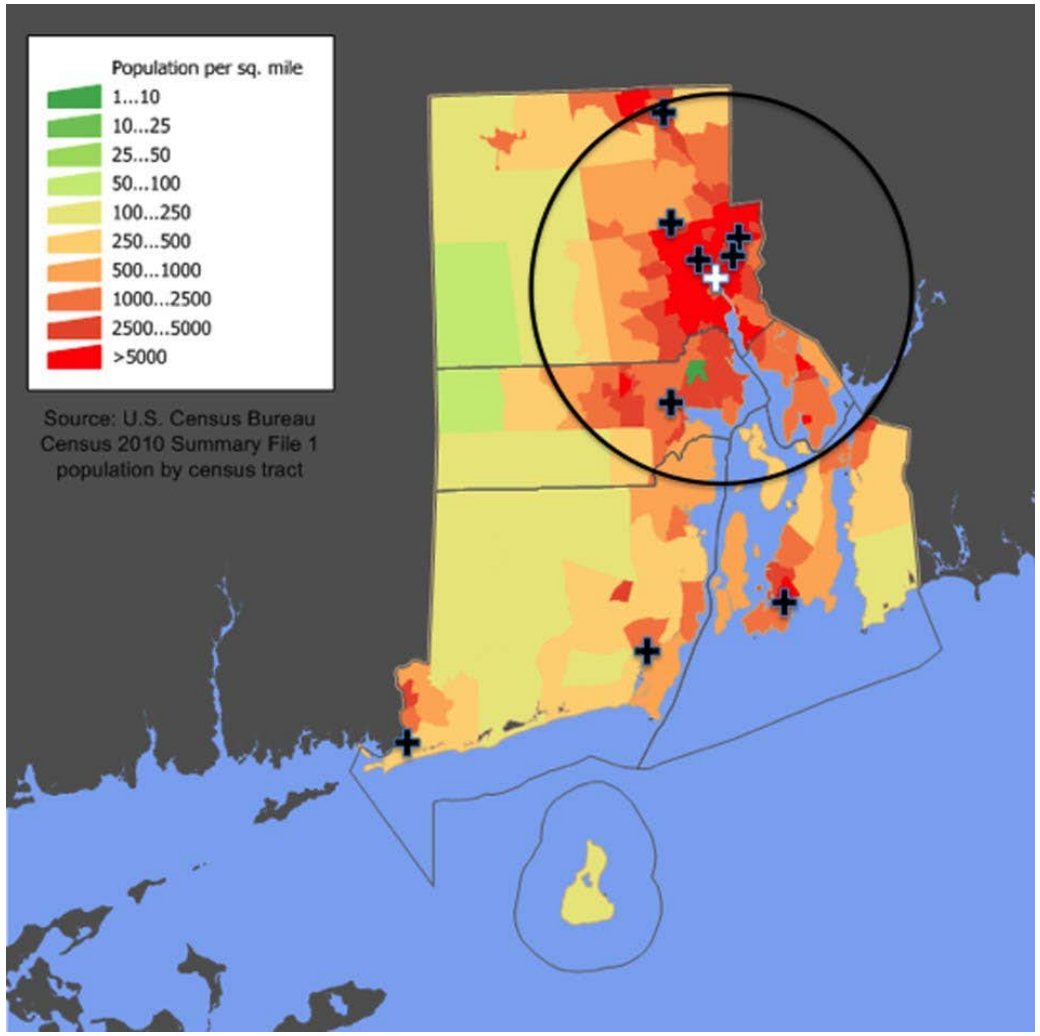
Goals

Welcome from RI

How are we doing?

What can we do better?

Goals for next year?



Welcome from Rhode Island!

Second most densely populated state (after NJ).

About 1.5M people in region (RI and some MA)

1 CSC
8 PSC
1 ASRH

5-6 nearby hospitals in MA and CT

89 ambulance services

Began LAMS triage 30 minute radius 2017 JAN, expands to no time limit in 2020 JAN

How Are We Doing?

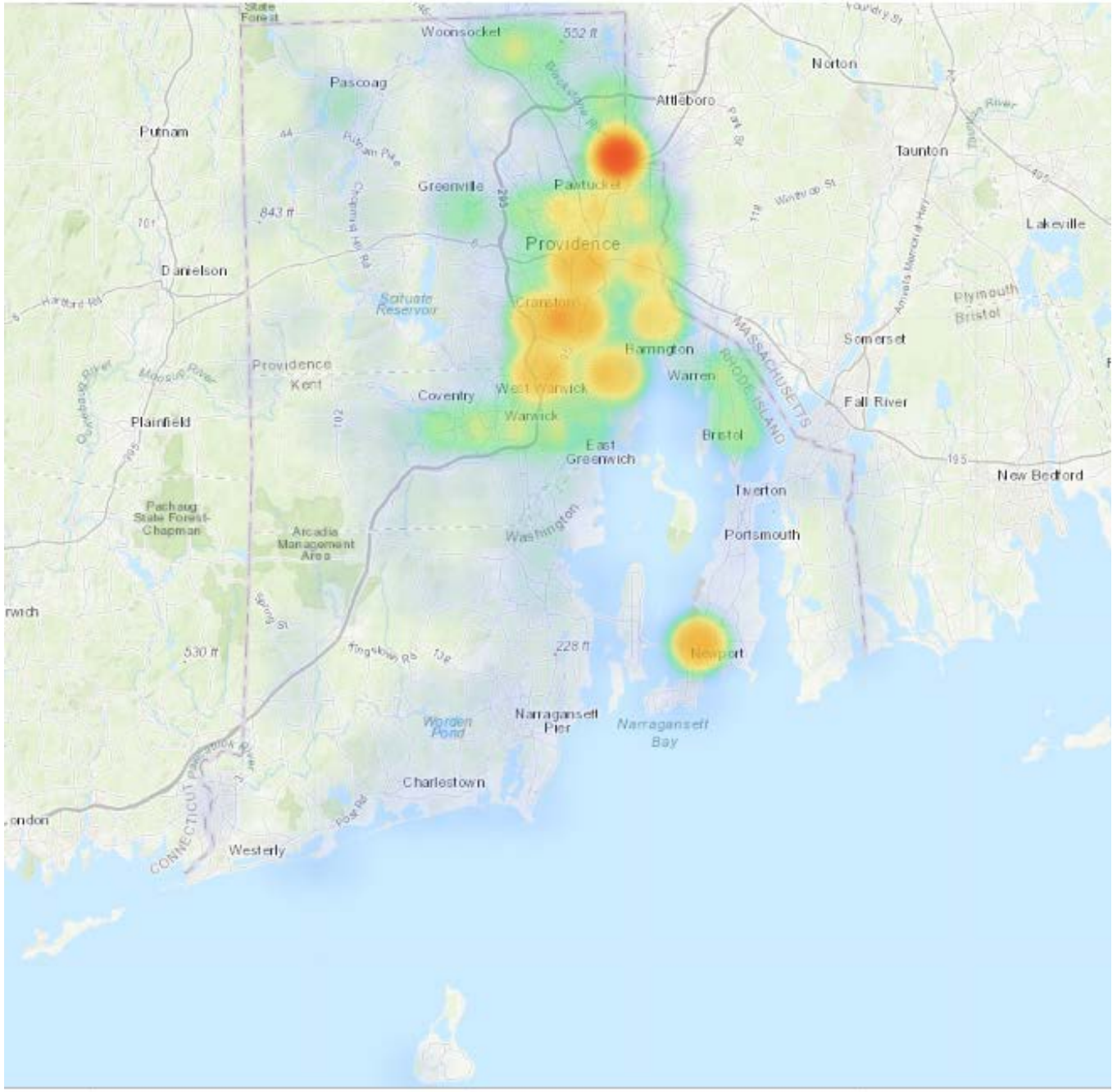
	Transfer	Direct	p value
Demographics			
Number	144	88	
Age	75.5 [64 - 84]	77.5 [63.5 - 86]	.55
%Female	74/144 (51%)	46/88 (52%)	.90
Stroke risk factors			
Hypertension	102/144 (71%)	59/88 (67%)	.54
Diabetes Mellitus	25/144 (17%)	13/88 (15%)	.60
Hyperlipidemia	78/144 (54%)	34/88 (39%)	.02
Atrial Fibrillation	57/144 (40%)	39/88 (44%)	.48
Admission systolic blood pressure (mean +-SD)	143.1 +- 30.05	146.8 +- 28.11	.48
Independent pre-stroke	101/144 (70%)	60/88 (68%)	.75
Clinical Parameters			
NIHSS	17.5 [13.0 - 22.5]	18 [12.0 - 24.5]	.64
IV tPA administered (%)	94/144 (65%)	48/88 (55%)	.13
Left hemisphere involved (%)	80/144 (56%)	43/88 (49%)	.35
Location of intracranial occlusion			.93
ICA	18.8%	17.0%	
M1	66.7%	67.0%	
M2	14.6%	15.9%	
NCCT ASPECTS	10 [9 - 10]	10 [9 - 10]	.95
Imaging repeated at CSC on arrival	33/144 (27%)	N/A	
Scene Geographic Information			
Distance from scene to closest PSC (miles)	3.3 [1.6 – 6.0]	4.4 [1.6 – 6.7]	0.1318
Drive time from scene to closest PSC (minutes)	9.55 [5.45 - 14.05]	11.1 [6.55 - 15.65]	.049
Distance from scene to CSC (miles)	23.1 [15.8 – 33.9]	10.7 [6.3 – 14.6]	<.0001
Drive time from scene to CSC (minutes)	29.8 [21.7 – 39.6]	17.6[12.2 – 23.2]	<.0001
EMS Scene workflow times (in minutes)			
Stroke onset to EMS arrival on scene	39.55 [16.5 - 133.15]	50 [17 - 290.6]	.29
EMS on scene time	15.5 [12.0 – 19.0]	13.5 [10.0 – 16.0]	0.0169
Scene departure to hospital arrival	8.5 [5.3 – 12.6]	15.8 [11.5 – 19.6]	<.0001
In-Hospital workflow times (in minutes)			
First Hospital arrival to alteplase	53 [40 - 71]	33 [27 - 46]	<.0001
PSC arrival to departure (Door in to door out)	85 [65 - 109]	N/A	
Inter-facility Transport time	25 [17 - 32]	N/A	
CSC Arrival to arterial puncture	21.5 [16.0 – 39.0]	77 [54 - 104]	<.0001
Arterial puncture to recanalization	22 [15 - 32]	24 [16 - 37]	.29
Successful recanalization (mTICI 2b or better)*	83%	87%	.78
mTICI 0/1	8/127 (6%)	4/85 (5%)	
mTICI 2a	14/127 (11%)	7/85 (8%)	
mTICI 2b	39/127 (31%)	24/85 (28%)	
mTICI 2c/3	67/127 (52%)	51/85 (59%)	

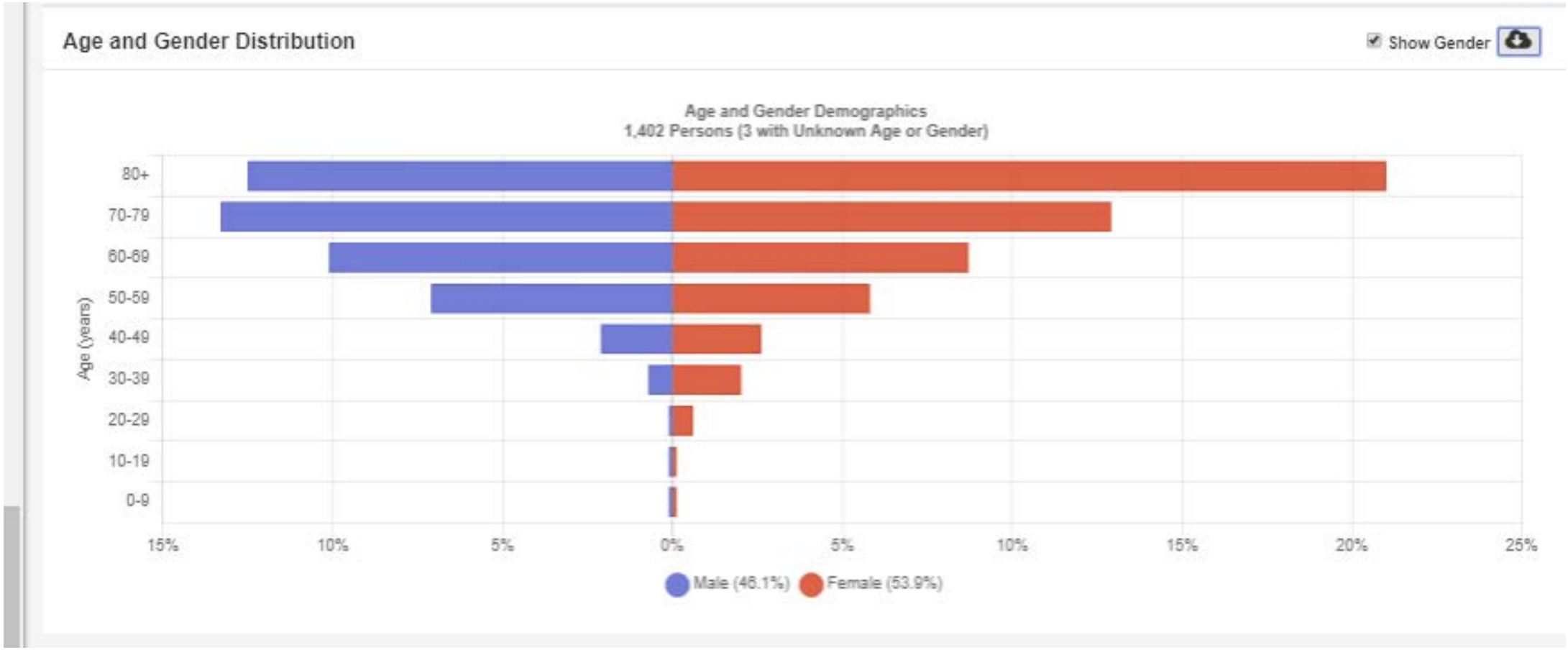
Table 1: Demographics, EMS scene parameters and workflow times for all patients. Values presented as mean +- SD, or median [IQR]
*Among those who underwent EVT.

2019 JAN 01 – 2019 SEPT 30

1376 stroke syndrome EMS patients

(does not include other arrival modes or in-hospital strokes)





EMS Stroke Syndrome

46% MALE

53% FEMALE

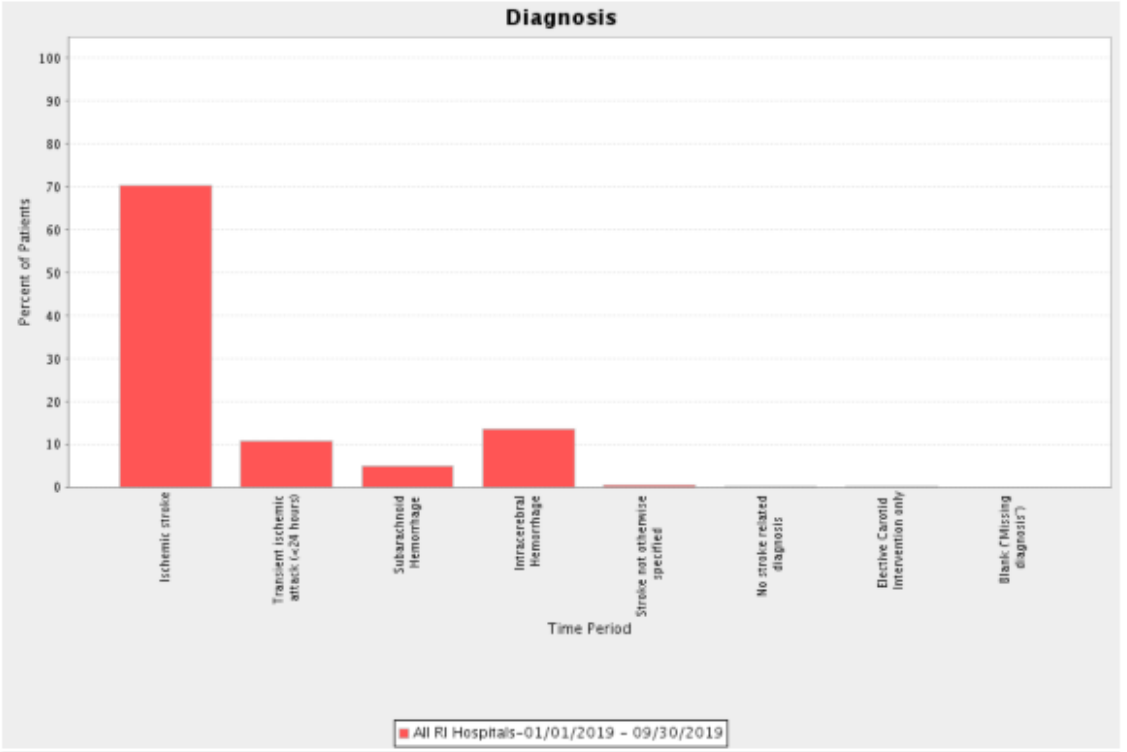
70% ischemic stroke patients

Only 10.8% TIA

Diagnosis

Patients grouped by diagnosis.

Time Period: 01/01/2019 - 09/30/2019



Data For: Diagnosis										
Benchmark Group	Time Period	Ischemic stroke	Transient ischemic attack (<24 hours)	Subarachnoid Hemorrhage	Intracerebral Hemorrhage	Stroke not otherwise specified	No stroke related diagnosis	Elective Carotid Intervention only	Blank ("Missing diagnosis")	Total
All RI Hospitals	01/01/2019 - 09/30/2019	1379 (70.3%)	211 (10.8%)	96 (4.9%)	263 (13.4%)	10 (0.5%)	1 (0.1%)	1 (0.1%)	0 (0%)	1961

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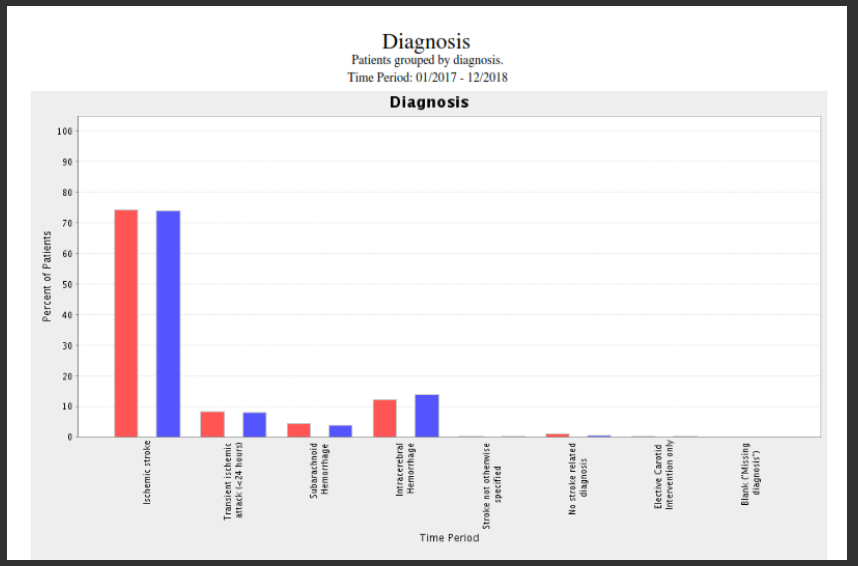
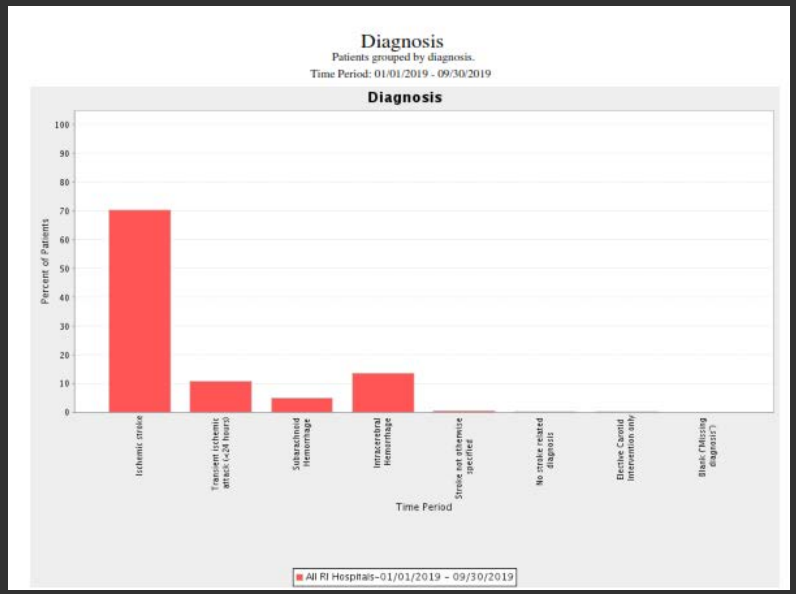
Diagnosis

Not a big change 2017 to 2018 to 2019





All RI Hospitals

Data For: Door-in-Door-Out Times at First Hospital Prior to Transfer for Acute Therapy					
Benchmark Group	Time Period	Numerator	Denominator	Exception	% of Patients
All RI Hospitals	01/01/2019 - 09/30/2019	5	11	3	45.5%

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Transfer DIDO <= 90 minutes

- 19 transfers in 9 months? Are we missing some data?

DIDO <= 90 minutes for Transfer Improved

2017 ---

2018 33.3 % (12)

2019 45.5% (19)

But data missing – numbers are low.

Data For: Door to Start of Revascularization (DTR) within 60 minutes for patients transferred from an outside hospital OR 90 minutes for patients presenting directly.					
Benchmark Group	Time Period	Numerator	Denominator	Exception	% of Patients
All RI Hospitals	01/01/2019 - 09/30/2019	66	136	5	48.5%

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DTR (door to start EVT)
<60 for transfer
<90 for direct

Room for improvement, but a challenge. Very close to Phase III 50% goal!

DTR Door to Start EVT (60 transfer, 90 direct)

2017 55.6% (85/153 2 exceptions)

2018 54.8% (108/197 8 exceptions)

2019 48.5% (66/136 5 exceptions)

22.6% received thrombolytic therapy

Contraindications?

Late presentation?

Consent?

Any Thrombolytic Therapy?

2017 22.2 % (1801)

2018 24.5% (1765)

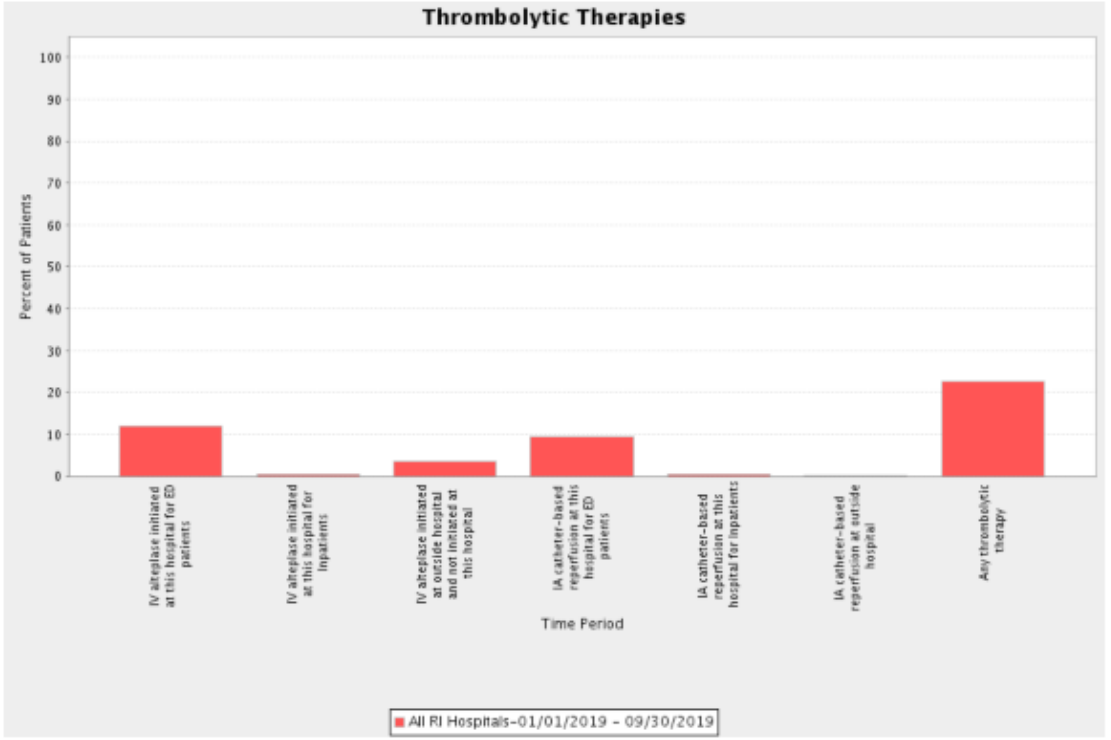
2019 22.6% (1356 through Sept)

2019 Thrombolytic Detail

Thrombolytic Therapies

A histogram of the various thrombolytic therapies

Time Period: 01/01/2019 - 09/30/2019



Data For: Thrombolytic Therapies

Benchmark Group	Time Period	IV alteplase initiated at this hospital for ED patients	IV alteplase initiated at this hospital for Inpatients	IV alteplase initiated at outside hospital and not initiated at this hospital	IA catheter-based reperfusion at this hospital for ED patients	IA catheter-based reperfusion at this hospital for Inpatients	IA catheter-based reperfusion at outside hospital	Any thrombolytic therapy	Total
All RI Hospitals	01/01/2019 - 09/30/2019	161 (11.9%)	6 (0.4%)	47 (3.5%)	127 (9.4%)	4 (0.3%)	1 (0.1%)	307 (22.6%)	1356

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Data For: Time to Intravenous Thrombolytic Therapy - 60 min				
Benchmark Group	Time Period	Numerator	Denominator	% of Patients
All RI Hospitals	01/01/2019 - 09/30/2019	90	113	79.6%

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80% thrombolytics <60 minutes

44% lytics < 45 minutes

Data For: Time to Intravenous Thrombolytic Therapy - 45 min				
Benchmark Group	Time Period	Numerator	Denominator	% of Patients
All RI Hospitals	01/01/2019 - 09/30/2019	59	133	44.4%

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6.7 % < 30 minutes

Data For: Time to Intravenous Thrombolytic Therapy - 30 min				
Benchmark Group	Time Period	Numerator	Denominator	% of Patients
All RI Hospitals	01/01/2019 - 09/30/2019	10	149	6.7%

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Data For: IV Alteplase Arrive by 2 Hour, Treat by 3 Hour				
Benchmark Group	**Time Period**	**Numerator**	**Denominator**	**% of Patients**
All RI Hospitals	01/01/2019 - 09/30/2019	102	107	95.3%

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95.3% thrombolytics within 3 hours of LKW if arrived by hour 2

Thrombolytic Timing

	<60	<45	<30
2017	84.4	41.0	12.2
2018	86.1	41.8	10.9
2019	79.6	44.4	6.7

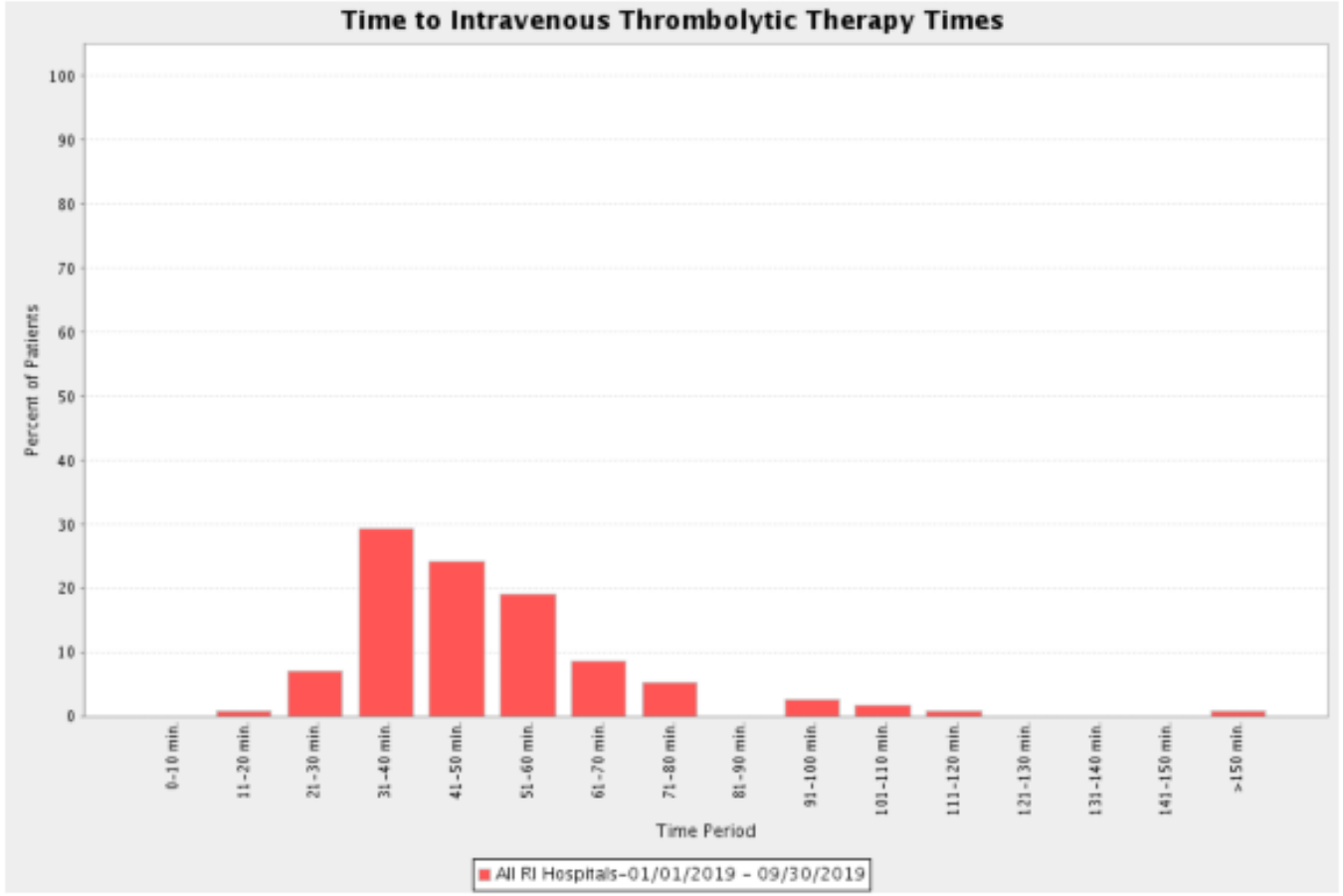
Are we slowing down?

2019 Time to Thrombolytics

Time to Intravenous Thrombolytic Therapy Times

Time from hospital arrival to initiation of thrombolytic therapy administration for ischemic stroke patients treated at my hospital

Time Period: 01/01/2019 - 09/30/2019



Data For: Time to Intravenous Thrombolytic Therapy Times

Benchmark Group	Time Period	0-10 min.	11-20 min.	21-30 min.	31-40 min.	41-50 min.	51-60 min.	61-70 min.	71-80 min.	81-90 min.	91-100 min.	01-11 min.	11-12 min.	21-13 min.	31-14 min.	41-15 min.	>150 min.	Total	Mean	Standard Deviation	Median	Range
All RI Hospital	01/01 - 09/30	0 (0%)	1 (0.9%	8 (6.9%	34 (29.3%	28 (24.1%	22 (19%)	10 (8.6%	6 (5.2%	0 (0%)	3 (2.6%	2 (1.7%	1 (0.9%	0 (0%)	0 (0%)	0 (0%)	1 (0.9%	116	50.1	20.5	45	13 - 152

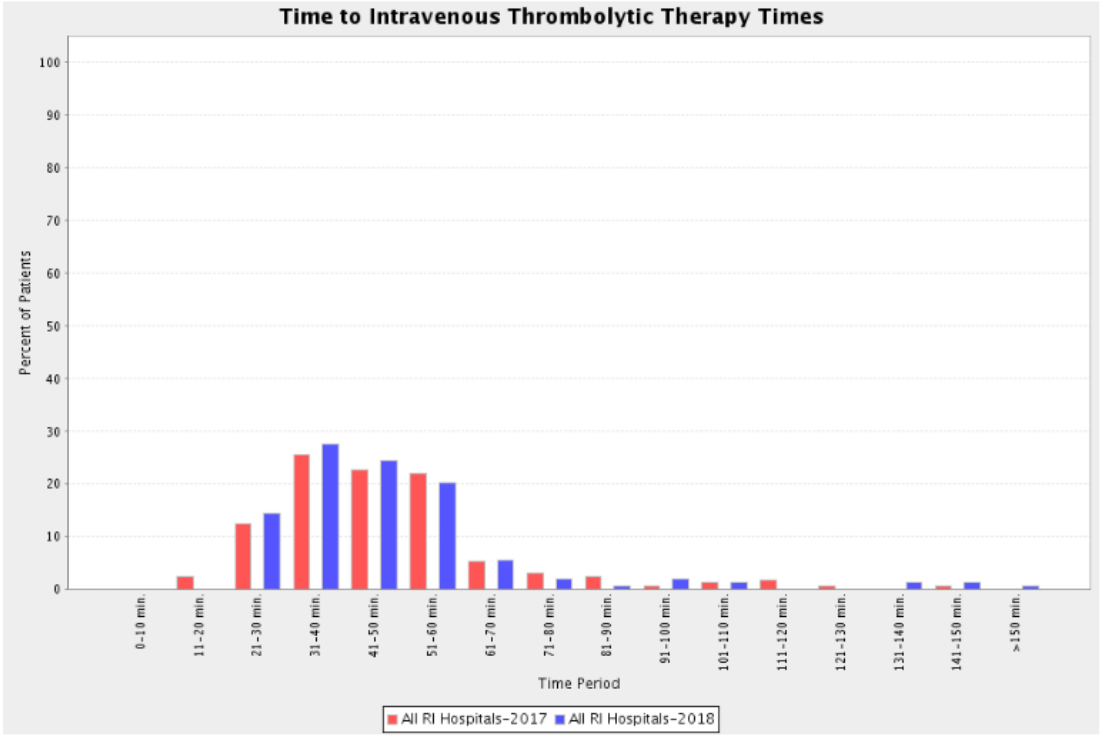
Date of report: 10/03/2019 15:29:12 GMT-04:00

2017 & 2018 Time to Thrombolytics

Time to Intravenous Thrombolytic Therapy Times

Time from hospital arrival to initiation of thrombolytic therapy administration for ischemic stroke patients treated at my hospital

Time Period: 01/2017 - 12/2018



Data For: Time to Intravenous Thrombolytic Therapy Times
Note: Time periods at the end of the graph and data table have been omitted because there were no patient records during that time.

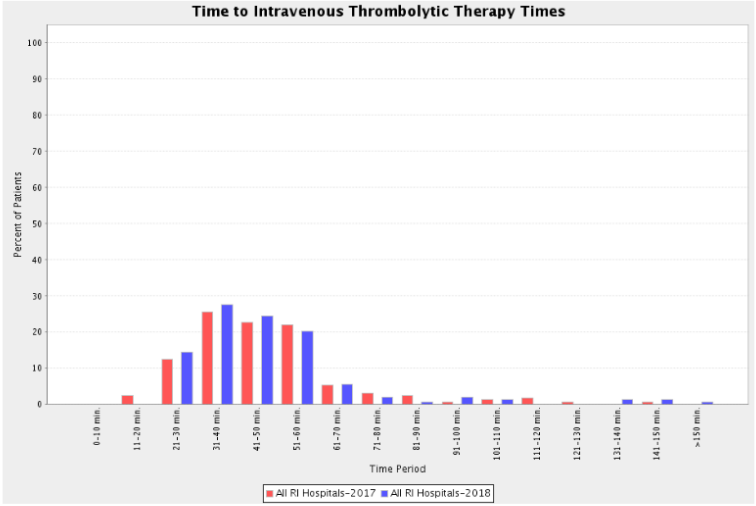
Benchmark Group	Time Period	0-10 min.	11-20 min.	21-30 min.	31-40 min.	41-50 min.	51-60 min.	61-70 min.	71-80 min.	81-90 min.	91-100 min.	101-110 min.	111-120 min.	121-130 min.	131-140 min.	141-150 min.	>150 min.	Total	Mean	Standard Deviation	Median	Range
All RI Hospital	2017	0 (0%)	4 (2.4%	21 (12.4%	43 (25.4%	38 (22.5%	37 (21.9%	9 (5.3%	5 (3%)	4 (2.4%	1 (0.6%	2 (1.2%	3 (1.8%	1 (0.6%	0 (0%)	1 (0.6%	0 (0%)	169	48.2	20.9	46	19 - 149
All RI Hospital	2018	0 (0%)	0 (0%)	24 (14.3%	46 (27.4%	41 (24.4%	34 (20.2%	9 (5.4%	3 (1.8%	1 (0.6%	3 (1.8%	2 (1.2%	0 (0%)	0 (0%)	2 (1.2%	2 (1.2%	1 (0.6%	168	48.9	24.6	44	23 - 214

Date of report: 10/07/2019 11:15:41 GMT-04:00

Time to Intravenous Thrombolytic Therapy Times

Time from hospital arrival to initiation of thrombolytic therapy administration for ischemic stroke patients treated at my hospital

Time Period: 01/2017 - 12/2018



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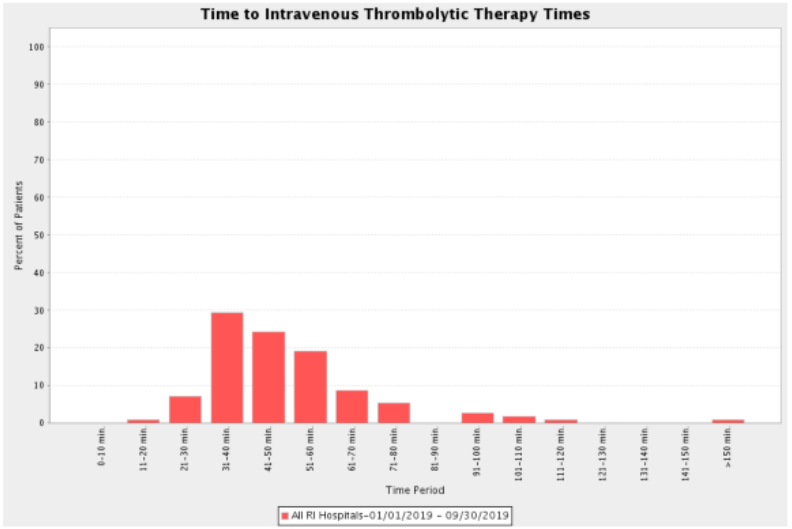
Time to Intravenous Thrombolytic Therapy Times

Time from hospital arrival to initiation of thrombolytic therapy administration for ischemic stroke patients treated at my hospital

Time Period: 01/01/2019 - 09/30/2019



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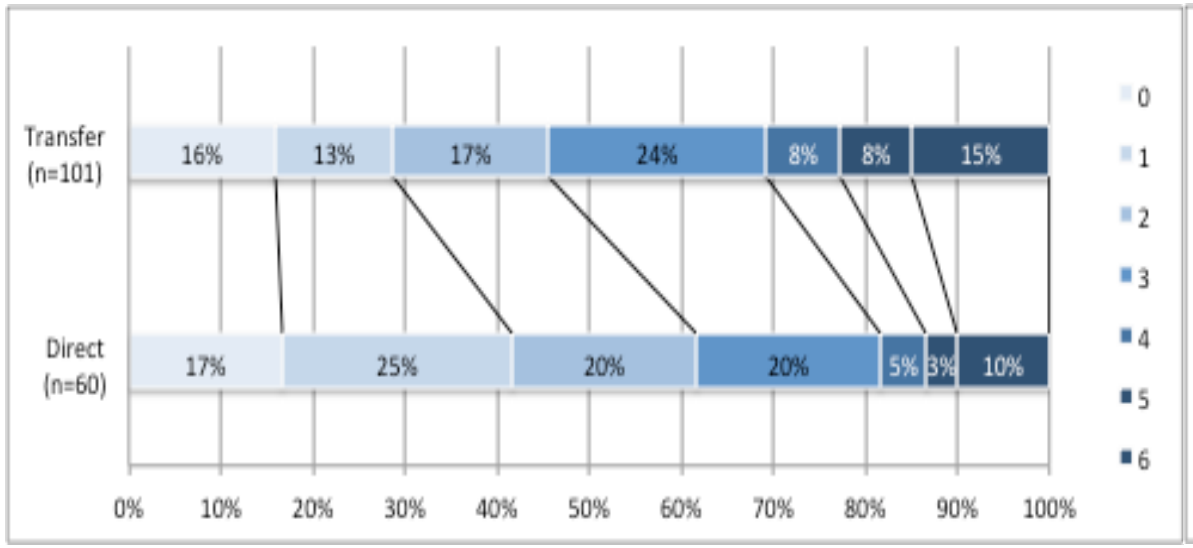
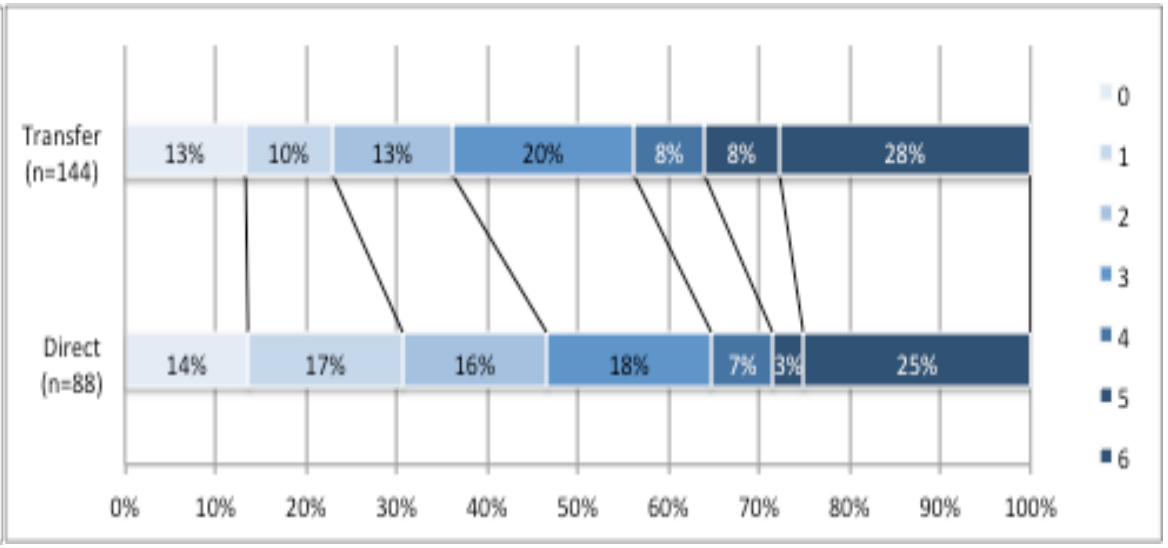
2017 & 2018 vs 2019

About the same?

Independent pre-treatment



Includes pre-stroke disability

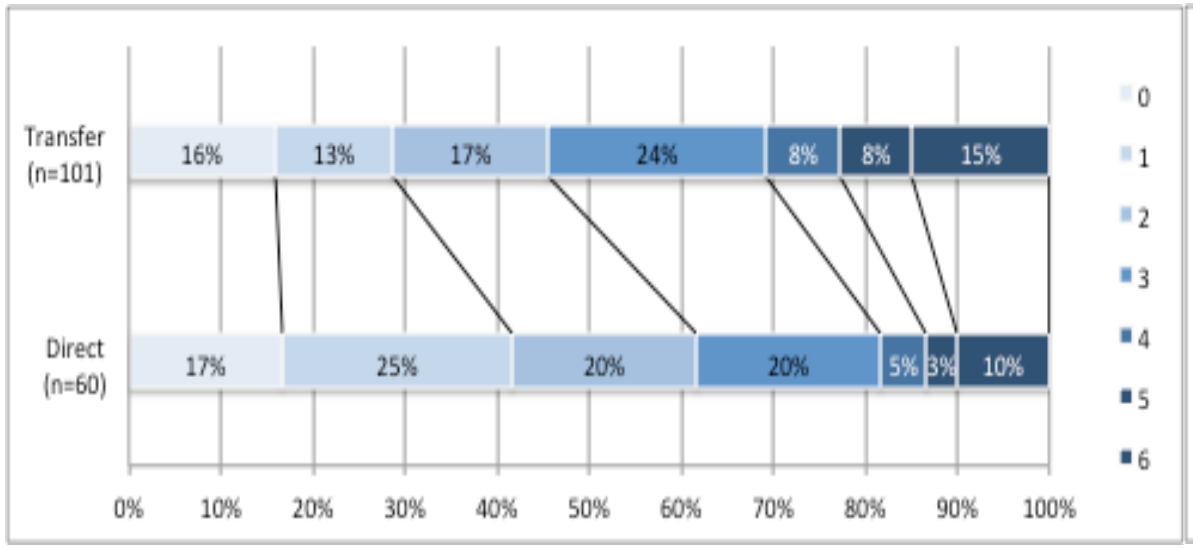


How are We Doing? Patient Outcome!
Modified 90-day Rankin Scores 2016 & 2017 Data

Modified Rankin Scale

0	No Symptoms
1	No significant disability, despite symptoms. Can do all ADLs.
2	Slight disability. Can do ADLs but not all previous activities.
3	Moderate disability. Requires some help, but can walk.
4	Moderately severe disability. Unable to walk / bodily needs without assistance.
5	Severe disability. Bedridden, incontinent, constant care.
6	Dead.

Independent pre-treatment



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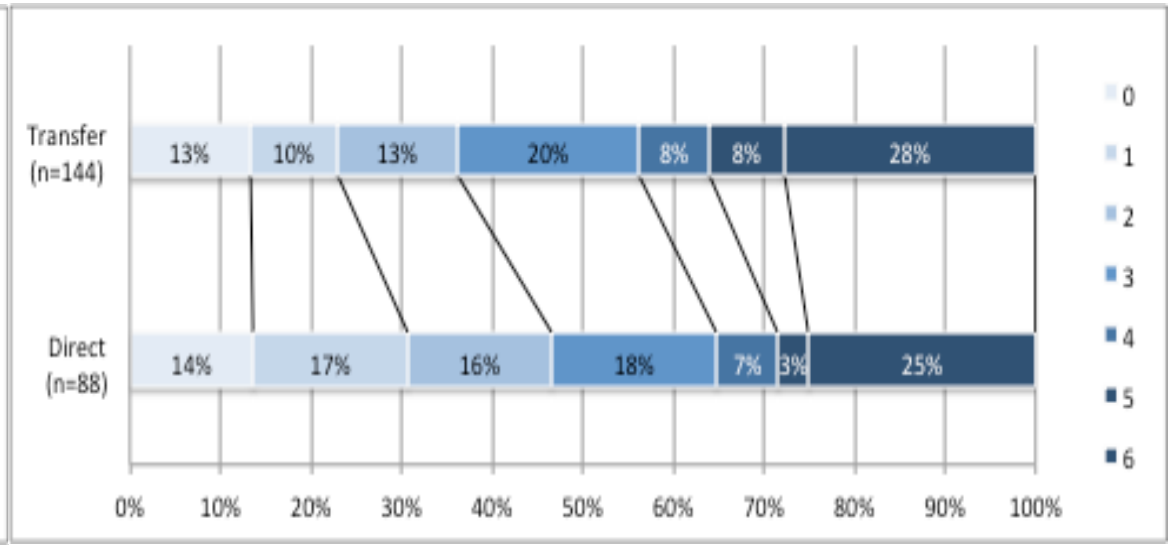

How are We Doing?
Modified 90-day Rankin Scores 2016 & 2017 Data

Shift to right shows improved outcome with Direct

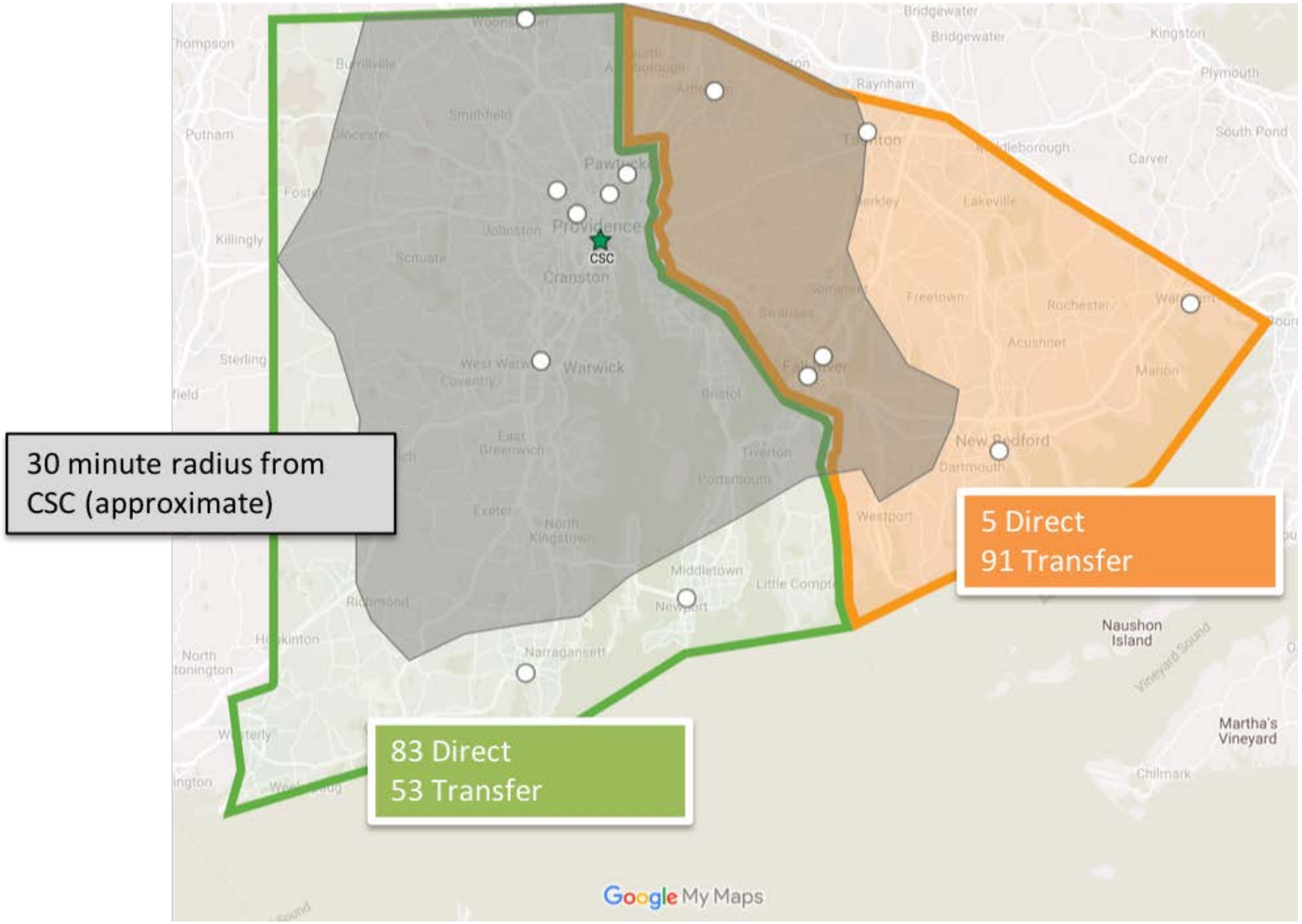

Figure 1b: Geographic distribution of patients. The area in green represents the region where field triage was mandatory as of March 1, 2017. The area in orange represents the region where there is no severity based triage. The shaded grey area indicates an approximate 30 minute transfer time to the CSC. The green star is the CSC, and the white circles indicate PSCs.

Rate of functional independence at 90 days increased from 46% in the transfer group to 62% in the direct to CSC group.

2016 & 2017 30 minute triage rule

EMS Data

Very few RI hospitals enter EMS data into the guidelines database.

If more did so, we could present more information on scene time, transport distance, etc.

Hopefully, this will get easier with advances in the EMS ePCR.

What Can We Do Better?

2010 Phase I 50% lytic within 60 minutes of arrival (DTN)

2015 Phase II 75% lytic within 60 minutes of arrival (DTN)

2018 Phase III - value of EVT (endovascular therapy)

Door-to-needle times within 60 minutes in 85 percent or more of acute ischemic stroke patients treated with IV thrombolytics. We are at 79.6

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). We are at 48.5.

SECONDARY GOALS

Achieve door-to-needle times within 45 minutes in 75 percent or more of acute ischemic stroke patients treated with IV thrombolytics. We are at 44.4.

Achieve door-to-needle times within 30 minutes in 50 percent or more of acute ischemic stroke patients treated with IV thrombolytics. We are at 6.7. Hmmmm.

Goals for Next Year?

Improved data reporting.

Agreement on best practices.

Improved outreach and education.


U.S. COAST GUARD
U.S. COAST GUARD

Summary

Rhode Island is amazing, but we can be even better!

Let’s be open to new / next therapies and research, and work toward agreement.

Let’s work together to improve stroke care for EVERYONE!

Audience Question 1

What is the most important measure of stroke system quality?

A] ED door to CT time.

B] ED door to tPA needle time.

C] Discharge / 90 day patient outcome using mRs / NIHSS

D] Change in NIHSS after tPA

Audience Question 2

The next big challenge for RI in stroke care is:

A] Improved public awareness.

B] Reduced door-to-treatment time.

C] Increased CT Angio rate for all stroke patients.

D] Agreement on best practices.

Questions?

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