Wake County EMS Stroke Care

Stroke Advisory Council
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WAKE COUNTY
NORTH CAROLINA

Stroke Care for Wake EMS

- Overview
- Screening
- Treatment and Transport
- Reporting, Follow-up, and Partnerships

Overview

- **About 2000 patients per year that we/EMS consider to be "code strokes"**
  - About 1200 end up with a stroke diagnosis
  - "Over-triage" is ok…
- **ALL EMS destinations including FEDs are at least stroke-ready**
- **Three in-county hospitals provide interventional services (WakeMed Raleigh & Cary, UNC-Rex)**

Screening

- **"modified" LAPSS – we want to be overly sensitive**
  - "original" LAPSS: Facial weakness, arm weakness, grip weakness
    - Also age >45 , ambulatory, no seizure hx
  - CPSS: Facial weakness, arm weakness, speech difficulty

- **VAN exam for possible Large Vessel Occlusion (LVO)**

Screening

- LAPSS/CPSS combo?
- "modified" LAPSS:
- *we want to be overly sensitive*
- We have had many "atypical" strokes: mute, cortical hand syndromes, ?seizure..

Standards Procedure (Skill) Assessment / Screening Section

Stroke Screen – Page 1
Step 1: Modified LA Prehospital

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Suspected Stroke Patient

Procedure:

1. Assess and treat suspected stroke patients as per protocol.
2. The Los Angeles Prehospital Stroke Screen (LAPSS) form should be referenced as necessary for all suspected stroke patients (see appendix). There are six screening criteria items on the LAPSS form- see below for Wake County-specific modifications.

3. Screen the patient for the following criteria:
   - For the utilization of this screen in the Wake County EMS System, there is no age cutoff; consider any age patient as "yes" for possible stroke. HOWEVER, there is no "CODE STROKE" process for pediatric (age less than 18) patients. If a pediatric patient screens positive for possible stroke, give this information during your usual call-in, but there is NOT an in-hospital "code stroke" response for pediatrics.
   - New onset of neurologic symptoms in last 24 hours
   - For the utilization of this screen in the Wake County EMS System, there is no ambulatory requirement; i.e. patients non-ambulatory at baseline can screen "yes" for possible stroke.

4. The final criterion consists of performing a patient exam looking for facial droop, unilateral grip weakness/absence, or unilateral arm weakness. If the patient has one of these exam components, they are POSITIVE for this Step 1 of the Stroke Screen.

5. If all of the LAPSS screening criteria are met ("yes" to all criteria, including at least one exam component OR if unknown), OR if the patient has slurred speech not related to alcohol or toxic ingestion or cannot talk, follow the EMS System Stroke Destination Plan and alert the receiving hospital of a possible stroke patient as early as possible.

6. If the patient is POSITIVE for this initial stroke screen, proceed to PAGE 2 of THIS PROCEDURE to complete a VAN assessment for possible large vessel occlusion.

7. Documentation of ALL stroke screening should be completed in your PCR.

Screening

- **If "Step 1 screening" is positive for at least one exam criterion, the patient is considered a "code stroke"**
- **"Step 2 screening" is the VAN exam**
  - If the patient has arm weakness, do they also have:
    - Visual Problems?
    - Aphasia?
    - Neglect?
- **Screening and time Last Known Well (LKW) inform transport destination decisions**

What Is StrokeVAN?

It is a way to tell if someone is having a large artery stroke. Large artery stroke types tend to have worse outcomes and disable people. They are best treated with the additional use of Neurointerventional clot retrieval. Using VAN can assist people in getting loved ones in a center that performs these procedures, in turn giving them the best possible chance of functioning independently.

Vision

Has forced gaze or preference to one side or lost vision on one side.

Aphasia

Medical term for understanding language and producing language.

Neglect

Medical term for ignoring your left body. Loved one will deny that you touched their left side or they have weakness on left usually.

Why VAN?

Van is more accurate, easier to perform, no calculation, and has potential for much better inter-observer reliability. VAN uses the simplicity of the easiest conducted tools and combines with more cortical symptoms testing of longer and more accurate tools.

DEMO VAN

BENEFITS	VAN	LEGS	RACE	LAMS	CPSSS
Tests Cortical Symptoms	✓	✓	✓	✗	✓
No Need to Calculate Score	✓	✗	✗	✗	✗
No Need to Test Severity	✓	✗	✗	✗	✗
Does Not Test One MCA Branch Multiple Times	✓	✗	✗	✗	✓

Treatment and Transport

- **"Stroke Bundle" of care**
  - Recognition/screening
  - Scene time less than 10-15 minutes (when possible)
  - Blood glucose
  - 12 lead EKG
  - Blood drawn prehospital to assist with TPA decision-making
    - CBC
    - Coagulation markers
    - Type and Screen

Treatment and Transport

- **Destination based on patient preference for hospital system, very strong recommendations made for location based on time since LKW, VAN results**
  - Any VAN-positive patient (at risk for LVO) should go directly to an intervention-capable facility (with 5 available in/near Wake County, transport time is not an issue for us)
  - Any code stroke patient that is VAN negative and within the TPA window should go to the closest facility
  - Any code stroke patient that is outside the TPA window should go to an intervention-capable facility
  - Any doubt? Evolving/changing exam? Go to an intervention-capable facility

From Protocol UP 14: Patient has symptoms of Acute Stroke AND Positive initial Stroke Screen (mLAPSS):
1. Determine ACCURATE time "Last Known Well" and 2. Perform VAN exam (LVO screening tool)
Use "Last Known Well" (LKW) and VAN results to determine best destination:

Symptoms 0-4 hrs from LKW

VAN exam Negative

- EARLY NOTIFICATION and TRANSPORT to **ANY** Stroke-Ready Facility
  - Duke Health Raleigh
  - UNC-Rex
  - UNC-Rex Holly Springs
  - WakeMed Raleigh
  - WakeMed Cary
  - WakeMed North
  - WakeMed Apex
  - WakeMed Brier Creek
  - WakeMed Garner
  - UNC-Chapel Hill
  - Duke Durham

VAN exam Positive

- EARLY NOTIFICATION and TRANSPORT to a 24/7 **INTERVENTION CAPABLE** Stroke Center
  - UNC-Rex
  - WakeMed Raleigh
  - WakeMed Cary
  - UNC-Chapel Hill
  - Duke Durham

Symptoms 4- 22 hrs from LKW

VAN exam Negative or Positive

- EARLY NOTIFICATION and TRANSPORT to a 24/7 **INTERVENTION CAPABLE** Stroke Center
  - UNC-Rex
  - WakeMed Raleigh
  - WakeMed Cary
  - UNC-Chapel Hill
  - Duke Durham

Symptoms > 22 hrs from LKW

Transport to any ED

EMS Triage and Destination Plan

WAKE COUNTY

Reporting, Follow-up, and Partnerships

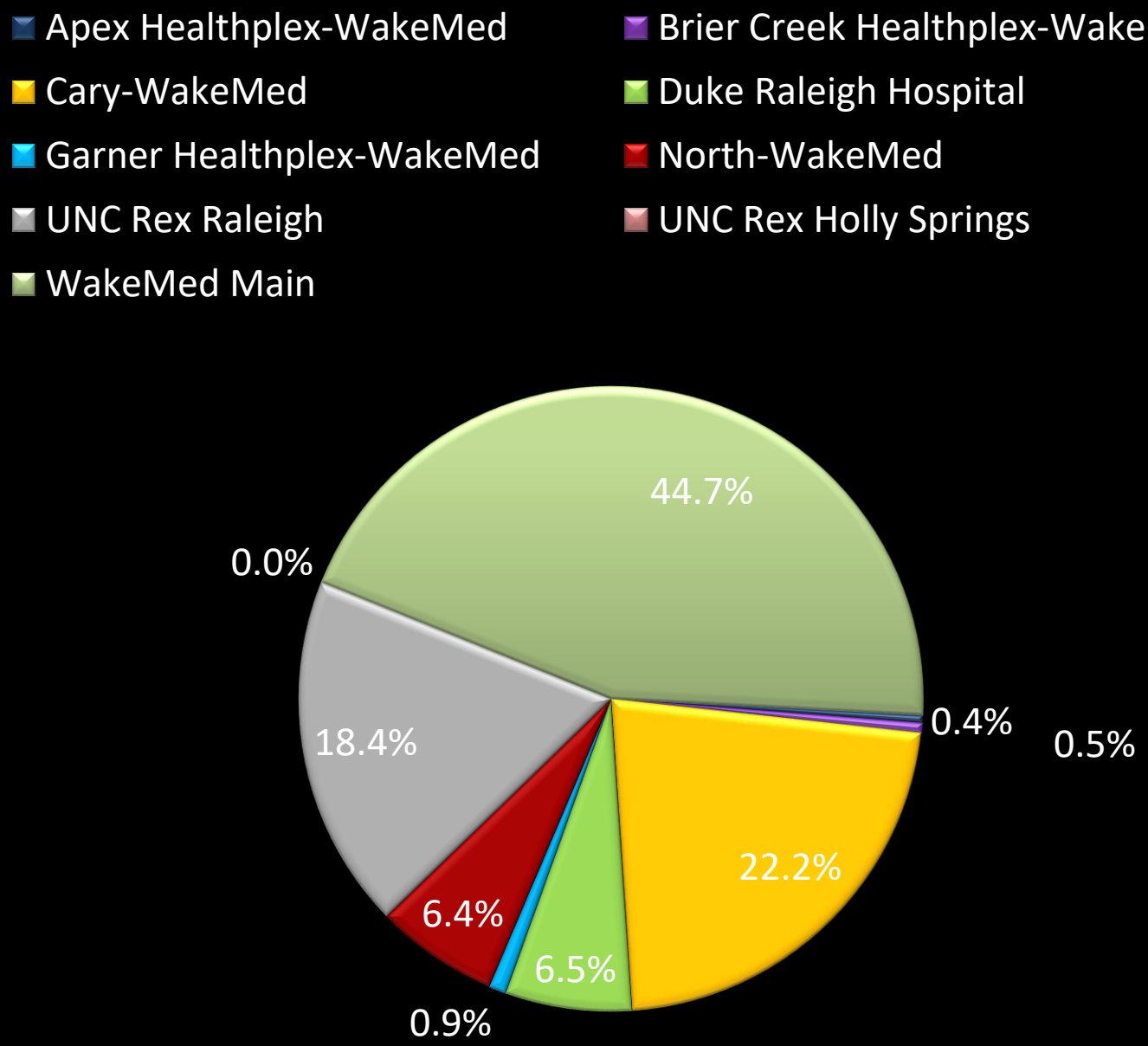
- **Three excellent and collegial hospital systems**
  - Duke, UNC, WakeMed
- **Data and case sharing between EMS and hospitals**
- **Quarterly EMS Peer Review meetings (next slides)**
  - Hospital stroke committee meetings as well

STROKE

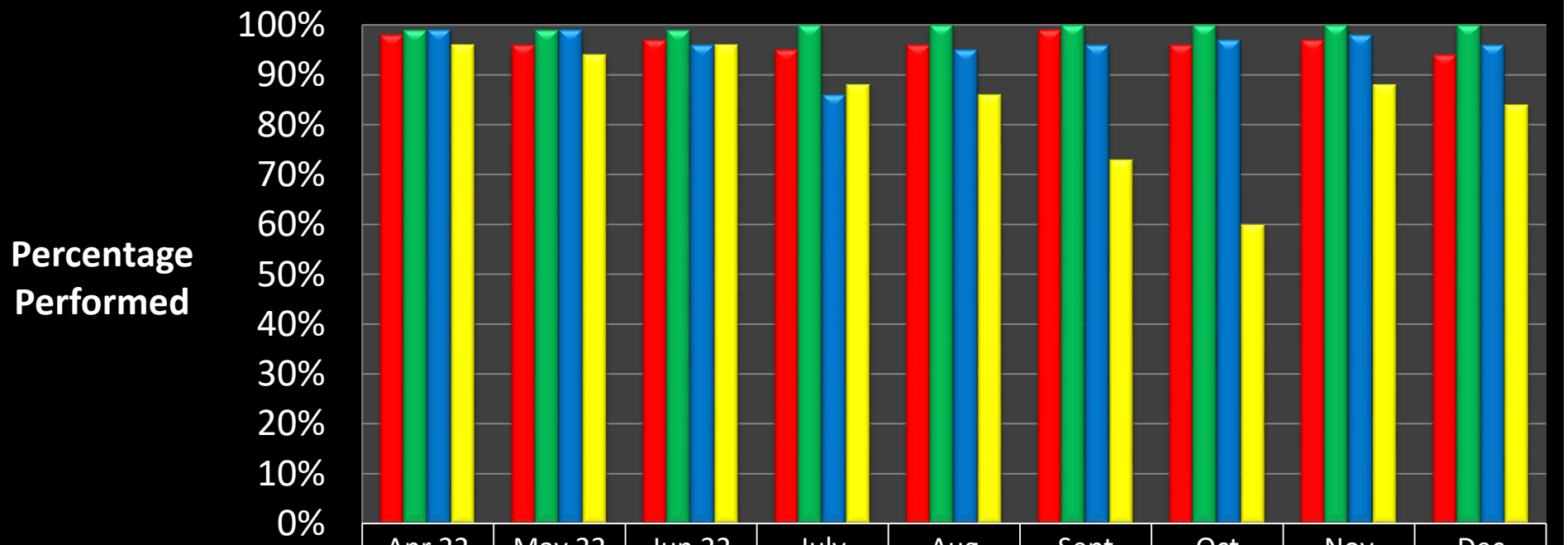
(Wake EMS Peer Review Stroke Slides)

Prompt
Compassionate
Clinically Excellent Care

Destination for Wake EMS Patients with Suspected or Confirmed Stroke

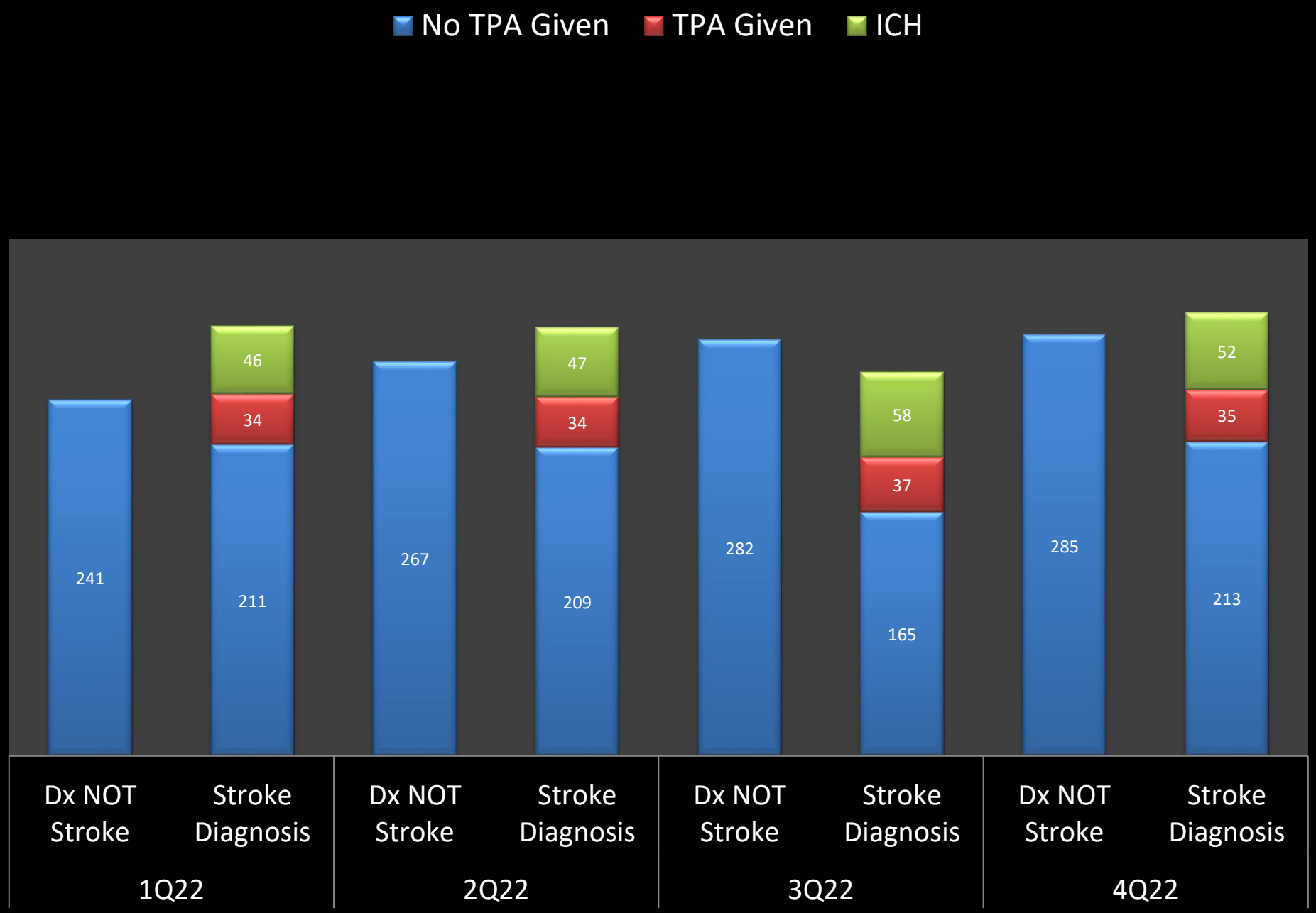


EMS Stroke Evidence Based Medicine Measures
Patients Transported by EMS with Suspected or Confirmed Stroke



	Apr 22 n=105	May 22 n=83	Jun 22 n-104	July n=94	Aug n=92	Sept n=82	Oct n=102	Nov n=121	Dec n=79
12 Lead	98%	96%	97%	95%	96%	99%	96%	97%	94%
BGL	99%	99%	99%	100%	100%	100%	100%	100%	100%
Scene Time Justified	99%	99%	96%	86%	95%	96%	97%	98%	96%
Blood Draw	96%	94%	96%	88%	86%	73%	60%	88%	84%

Code Strokes by EMS taken to Wake County Hospitals



Stroke Intervention

Date	Initial Hospital	2nd Receiving Hospital	Intervention Type	Intervention Performed	Initial ED to Puncture Time	TICI
11-Oct-22	Rex Healthcare	Rex	IA	Thrombectomy	3:03:05	2C
14-Oct-22	WakeMed Main	WakeMed Main	IA	Thrombectomy	1:19:27	0
22-Oct-22	WakeMed Main	WakeMed Main	IA	Thrombectomy	2:13:51	3
03-Nov-22	Cary-WakeMed	Wake Med Cary	tPA-IA	Thrombectomy	1:01:19	2b
15-Nov-22	Rex Healthcare	Rex	IA	Thrombectomy	1:48:06	2B
24-Nov-22	Cary-WakeMed	Wake Med Cary	IA	Thrombectomy	1:12:51	2c
24-Nov-22	WakeMed Main	WakeMed Main	IA	Thrombectomy	1:20:18	3
28-Nov-22	Rex Healthcare	Rex	IA	Thrombectomy	1:18:12	2A
30-Nov-22	Rex Healthcare	Rex	IA	None	1:53:15	NA
05-Dec-22	WakeMed Main	WakeMed Main	IA	Thrombectomy	1:41:12	2b
06-Dec-22	Rex Healthcare	Rex	IA	Thrombectomy	1:08:11	2B
08-Dec-22	WakeMed Main	WakeMed Main	IA	Thrombectomy	1:42:50	2b
10-Dec-22	Rex Healthcare	Rex	IA	Thrombectomy	1:50:45	3
15-Dec-22	Rex Healthcare	Rex	IA	Thrombectomy	1:22:37	2A
20-Dec-22	WakeMed Main	WakeMed Main	IA	None	2:36:17	NA

Lessons learned

- **The EMS and Hospital partnership is CRITICAL**
  - Same language ACROSS hospital systems
  - Same processes (VAN, "Launchpad," pt stays with EMS, etc.)
  - GOAL: standardization for RAPID, excellent patient care

- **EMS leadership can gather the continuum of care, can act as the "hub" or meeting point**
  - We see the patients first and initiate care and destination!

Questions?

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https://www.wake.gov/departments-government/emergency-medical-services-ems/public-information/ems-system-performance

EMS System Performance

Performance measurement is a responsibility of all EMS Systems. For clinical care there must be performance measurement as well as external validation of that measurement in accordance with rules set forth by the North Carolina Office of EMS (NCOEMS). The Peer Review Committee facilitates both requirements, and you can find reports below from each meeting regarding clinical care, EMS operations and professional development.

Peer Review Meeting Schedule

Peer Review meetings are held quarterly and open to the public.

2022 Meeting Schedule

Thu. Feb 17th
Thu. May 19th
Thu. Aug 18th
Thu. Nov 17th

Location
Wake County Emergency Services Education Center
221 S. Rogers Lane, Suite 160, Raleigh

Contact Vikki Lyman, 919-212-9675

Peer Review Quarterly Reports

Clinical Care

Operations

Professional Development