STROKE ADVISORY COUNCIL MEETING MINUTES
May 11, 2023
1 - 2:30 pm

Members/Partners

Present: Wally Ainsworth, Stroke Advisory Council (SAC) member; NC Office of EMS; Jim Albright, Guilford County EMS; Joseph Allen, Medtronic; Sue Ashcraft, Novant Health; Andrew Asimos, SAC member, Atrium Health; Bradley Beck, Randolph County EMS; Sharon Biby, SAC member; Cone Health; Allison Bissette, Johnston County EMS; Melanie Blacker, First Health; Dorothea Brock, Office on Rural Health (ORH); Olivia Broomer, Cone Health Alamance; Anna Bess Brown, Executive Director, Justus-Warren Heart Disease and Stroke Prevention Task Force (JWTF); Donald Brown, Pender County EMS; Katie Buck, Carolina East Medical Center; Stacey Burgin, Coverdell Stroke Program, CCCPH, DPH; Adrienne Calhoun, JWTF Board Member, Piedmont Triad Regional Council Area Agency on Aging; Tracey Carnes, Brunswick County EMS; Evan Carroll, Yancey County Community Paramedicine; Amber Carter, Cone Health; Mark Casey, Duplin County EMS; Shannon Chesney, Duke Raleigh; Matt Ciancarelli, J&J; Arnett Coleman, JWTF member, Old North State Medical Society; Sylvia Coleman, Coverdell Program; Tom Curley, Novant Health New Hanover Regional Medical Center (NHRMC); Carissa Dehlin, Novant Health Matthews Medical Center; Rizza de la Guerra, J&J; Matt Ehrlich, Duke; Heather Forrest, Duke; Melissa Freeman, Duke; Rebecca Gainey, Novant NHRMC; Nicholas Galvez, ORH; Sebastian Gimenez, ORH; Michelle Geroleman, WakeMed; David Glendenning, Novant EMS; Amy Guzik, SAC member, Atrium Wake Forest Baptist (AWFBH); Lindsey Hayes-Maslow, Task Force member, UNC; David Huang, Task Force and SAC member, UNC; Caitlin Hughey, UNC Health Blue Ridge; Sarah Jacobson, AHA; Edward Jauch, SAC member, MAHEC; Robin Jones, SAC member; Eddie Jordan, Surry County EMS; Hervy Kornegay, SAC member, Wayne UNC; Amanda Lambert, Novant Health Rowan Medical Center; Elizabeth Larson, Duke Raleigh; Sydney Lawrence, Lake Norman Regional Medical Center; Liz Maynor, Central Carolina Hospital; Kim McDonald, Chronic Disease & Injury (CDI), DPH; Davin McGinnis, Novant Health Greater Winston-Salem Market; Heather McLawhon, Novant Kernersville Medical Center; Lisa Monk, Duke Clinical Resource Institute, Improve Stroke; Terri Moore, Coverdell Stroke Program, CCCPH, DPH; Kathy Nadareski, WakeMed; Brian Nance, Anson EMS; Darrell Nelson, Atrium Wake Forest; Sharon Nelson, CDI, DPH; Dana Nevil, Genentec; Peg O'Connell, Chair, Stroke Advisory Council; Scott O'Connor, Guilford County EMS; Sarah O'Neal, WakeMed; Gaurang Palikh, SAC member, Neurologist; Melissa Papadopoulos, CCCPH, DPH; Pasquotank-Camden EMS; Mehul Patel, UNC Dept. of Emergency Medicine; Diane Perkins, Atrium; Renée Potter, UNC Stroke Program; Joey Propst, Task Force Member; Preston Roberson, Guilford County EMS; Chris Rogers, Halifax County EMS; Staci Smith, NHRMC; Lauren Stevenson, NHRMC; Julie Teachey, ECU Health; Chuck Tegeler, Vice Chair, SAC, AWFBH; Kate Turner, Sentara Albemarle Medical Center; Sarah Van Horn, UNC Health Blue Ridge; Emily Volk, Manager, Northern Regional Hospital; Michael Whitehurst; Morgan Wittman-Gramann, NCAH; Jeff Williams, Wake County EMS; Gwen Wise-Blackman, Minority Women Health Alliance.

Welcome and Introductions

Peg O'Connell, SAC Chair

Stroke Advisory Council chair Peg O'Connell welcomed everyone joining via MS Teams. She offered a special welcome to those attending a Stroke Advisory Council meeting for the first time and to those new in their roles as stroke coordinators. She also welcomed EMS partners joining because of the theme of the meeting and added that they are always welcome to SAC meetings.

Peg called for the approval of the minutes from the February 15th SAC meeting. She reminded members

that they had received an email with the minutes in advance of the meeting. The minutes were approved by acclamation with no corrections noted.
Peg shared very good news from our state. **Dr. Cheryl Bushnell** is a professor of neurology, vice chair of research, Stroke Division Chief, and co-director of the Neuroscience Clinical Trials and Innovation Center at Wake Forest University School of Medicine. She is a good friend to us and has served on the SAC board for years. At the **International Stroke Conference** Dr. Bushnell received the **American Stroke Association's Edgar J. Kenton III Award** which recognizes lifetime contributions to the investigation, management, mentorship, and community service in the field of racial and ethnic stroke disparities or related disciplines. Dr. Bushnell was also awarded the **ASA's Ralph L. Sacco Outstanding Stroke Research Mentor Award**. This award recognizes outstanding achievements in mentoring future generations of stroke researchers in the field of cerebrovascular disease. Cheryl is a leading stroke researcher, and we are so proud that she has received these well-deserved awards. Congratulations, Cheryl! Thank you for your dedication to treating stroke, to research, to mentoring, and to the Stroke Advisory Council.

Legislative Update
Peg explained that the House released its budget several weeks ago and that we expect the Senate's version of the budget next week. Next, members will go into conference and work out the differences. Medicaid Expansion became the law of the land and was signed by the governor. It could expire if NC doesn't have a budget by mid-June. She noted the sword of Damocles is over Medicaid Expansion as we await a budget. On our Action Agenda we are watching for money in the budget for youth smoking prevention and to make sure the Juul settlement funds will be allocated to youth tobacco use prevention efforts.
Changing NC Stroke Designation Law
Stroke language that includes definitions and adds Thrombectomy-Capable Stroke Centers to the 2013 policy is in the House Regulatory Reform Bill (H600). We will track it on the Senate side. Sarah Jacobson and AHA are working on these efforts.

Coverdell Stroke Program Update
Anna Bess Brown, Justus-Warren Heart Disease and Stroke Prevention Task Force and Stroke Advisory Council
Anna Bess reported that Coverdell Stroke Program work continues as Year 2 draws to a close. The two broad goals of the program are to strengthen stroke systems of care and to identify and address disparities. Funded Coverdell projects are doing excellent work using data from their EHRs, GWTG, and partners to track social drivers of health and address disparities. The excellent work of our Coverdell projects inspired the theme of today's meeting as they train and collaborate with local and regional EMS agencies to improve communication and care.
A large part of the work in Year 1 was to build a Stroke Registry within the HIE. At the February SAC meeting we celebrated the official launch of the Stroke Registry. The state office of IT wrote an article for their newsletter and issued a press release May 1st in conjunction with Stroke Awareness Month to promote the launch. Work with the HIE team continues with weekly meetings to address data quality.
Year 3 of the Coverdell Program runs July 1, 2023 - June 30, 2024. We will host a monthly call for Stroke Coordinators beginning in July. The call is voluntary, and topics will come from participants. All are welcome. Please send updated staff contact information to Anna Bess at anna.brown@dhhs.nc.gov to be included in the invitation.

Wake County EMS Stroke Care
Jeff Williams, MD, MPH, Deputy Medical Director, Wake County EMS

Dr. Williams presented Wake County EMS Stroke Response. He said they run 130,000 calls per year and respond to around 2000 cases considered possible stroke with about 1200 ending up with a diagnosis of stroke. He stated that over-triage is OK. He said Wake EMS encourages providers to be vigilant and consider, "Could this be a stroke?" He described the two-tiered screening process. Sensitivity means you want to capture as many people as possible who have stroke. He explained the quarterly EMS Peer Review meetings at which they share data with EMS, hospital systems, and the public. See his slides for details.
He noted these 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 and Discussion

1. Chuck Tegeler: For VAN positive patients, how are decisions made for which intervention-capable stroke center to transport to?
   A: The patient has a choice (if able to make one). If no preference, we take them to the closest hospital.
2. Mehul Patel: What does VAN training and continuing education look like? Is it all done by Wake EMS, or are stroke centers involved?
   A: Stroke Centers offer to help and provide guest speakers. We are well-resourced with our own in-house stroke assessment training. We have a module for new hires that trains on stroke screening and includes hands-on practice.
   Dr. Patel is a fantastic colleague who helped us evaluate our VAN score. Research paper on Wake Co EMS VAN accuracy: https://pubmed.ncbi.nlm.nih.gov/33893209/
3. Robin Jones: Do the hospitals in Wake County ever go on diversion for IA cases or communicate when table is not available?
   A: Yes, and yes. Diversion for IA cases is rare: when the biplane is down for maintenance, for example.
4. Robin Jones: does Wake EMS use a system which demonstrates real-time availability of neuro-intervention across each capable facility?
   A: No. There's not a place to look to see if the room is empty. We assume the facility is ready to do an IA case unless they tell us otherwise.

Collaborations among Hospitals and EMS to Strengthen Stroke Care
Peg introduced the panel of experts on the stroke system of care who discussed several of the lessons learned and challenges in that critical experience of dealing with a suspected stroke, transport, and hand-off. She encouraged participants to post comments and questions in the Chat.

Moderator:
Ed Jauch, Mountain Area Health Education Center; AHA Stroke Systems of Care
Panelists:
Wally Ainsworth, NC OEMS
Andrew Asimos, Atrium Health Charlotte

Darrell Nelson, Atrium Health Wake Forest Baptist
Mehul Patel, UNC Dept. of Emergency Medicine

Moderator Ed Jauch gave the history of stroke care. The first CT scan of the head that allowed us to make these considerations was done in 1971. tPA was not discovered until 1979. The progress in treating stroke in a short time has been amazing. 1986 tPA was approved for 0-3-hour window. In 2002 we saw the first stroke designation program in New York state. tPA was not reimbursed to hospitals until 2004. What started to change stroke care was understanding the building of stroke systems of care in 2013. There has been remarkable progress in 10 years. Drugs and systems of care are complemented by endovascular therapy opportunities which first came out in 2015).

Ed asked panelists for their responses to the presentation on Wake EMS and to describe their process. Andrew Asimos described Mecklenburg County's regionalized care. He explained they have two CSCs, and the hospital systems and EMS work closely. They have three years of data on the FAST ED score and are collecting data on neighboring counties. For several years they have provided metrics to EMS agencies, and they discuss pre-notifications across the region. They provide targeted feedback on the Triage and Destination Plan. They strive to optimize over- and under-triage to get each patient to the most appropriate and best care. Outside Mecklenburg County, we're collecting data as those counties begin to screen for LVO.
Ed asked if they are looking to harmonize their scores.
Asimos: In a perfect world, it would be great to have one screen for the whole state. However, in our region we plan to continue to allow folks to use whatever screen they choose. There is no perfect screen. It'd be a heavy lift for EMS agencies to switch screens.
Ed noted Delaware switched to VAN.
Darrell Nelson: Our system is similar to Mecklenburg's. We have two CSCs, and most of our region uses RACE. Hospitals are collegial; we get nice reports about our activations. I'm most interested in those folks we transport where we didn't activate as stroke. That data can be difficult to tease out. We are about 50% sensitive. I want our providers to call two strokes or more for every stroke.
Ed asked if folks are tracking Door-In Door-Out.
Andrew Asimos: We're tracking DIDO. Since COVID, inter-facility transport has become more challenging. If you can get patients to the right hospital first, that's ideal.
Darrell Nelson: A question in the Chat asked about taking patients direct to the CT scanner. I think most CSCs and primary stroke centers do. It's variable whether systems accept blood draws from EMS.
Ed: Wally and Mehul, what is your statewide view?
Wally: Dr. Nelson and NCEP try not to put everybody in the same box. Documents (Plans) allow flexibility for the EMS agency to work with the hospital depending on what their need is.
Mehul Patel: From the research perspective, the RACECAT trial is the most rigorous evidence we have so far on mothership model vs. drip and ship. It found no difference in patient outcomes for patients screened for LVO in the field and routed to thrombectomy-capable centers. As they dug in to data, they found DIDO times optimized, transferred to thrombectomy-capable centers. They were already transferring patients exceptionally well in the Catalonia region. A high-performing system may not need to put emphasis on prehospital screening, but systems that may be struggling with process should consider it.

Robin Jones: Do the hospitals share patient outcomes with EMS, i.e., discharge disposition and/or dc NIHSS?
A: Darrell Nelson responded yes. Andrew Asimos responded yes. Tom Curley noted in the Chat that New Hanover does provide feedback. Jeff Williams noted that all Wake EMS hospital partners provide

outcomes, dispositions, etc.; and Shannon Chesney added that Wake County hospitals provide discharge disposition, discharge diagnosis, and NIHSS if pt receives intervention.

Ed Jauch: How do we engage the rural environment?
A: Captain Donald Brown said Pender County EMS works closely with Novant New Hanover whose stroke team provides training.

Ed Jauch: Where are opportunities for improvement, data collection, and training?
Mehul said one early step is to provide feedback on diagnoses to EMS. Screening for EVO is a moving target. The types of strokes they are able to intervene on is expanding. Feedback on patients when they screen positive and negative is important.
Andrew Asimos: We can't ignore hemorrhage patients. In that study in Catalonia, ICH patients with a RACE score greater than 4 routed to higher level center had worse outcomes. It may be best to get patients to the closest hospital and stabilize them. There are lots of things we still need to look at. We need to look at hemorrhage patients as a group.
Darrell Nelson: We have just heard from three large systems that use different scores. In NC EMS is defined at the county level. These hospitals are good at regionalization. These large systems use different stroke scales. Those systems on the periphery decide between two CSCs in their region. This is on top of EMS staffing and training challenges and can be confusing for agencies and providers on the periphery. There are multiple screens, multiple choices for destination.
Ed Jauch: How to consider these overlaps in larger systems?
Darrell Nelson: We do not have the data. We will need to deal with it a bit longer.
Ed Jauch: No longer just LVOs. There are MVOs (medium vessel occlusions) that are smaller vessels which benefit. Do we lower scores to capture those eligible for thrombectomy? How to determine as threshold for thrombectomy gets lower and lower.
Mehul Patel: Start with a conservative approach in rural, lower resourced agencies. This may be the opposite of what Jeff said about Wake County. Prioritize specificity over sensitivity to minimize over-triage. Could overburden if small agency had to transfer out of county frequently.
Andrew Asimos: MVO may drive use of one screen over another. With VAN you have to see weakness. As we treat more MVO patients something to consider. We see patients who do not have weakness but have aphasia.
Ed Jauch: Our scores were built around LVOs-not MVOs. Do we need to go back to the drawing board on LVO screen to capture breadth of vessels eligible for thrombectomy?

Robin Jones noted the opportunity for inter-facility management of BP (both types of stroke).
Renee Potter noted in the Chat that UNCMC provides community education on recognition of stroke with calling 911 and internal/external stroke recognition training with current interventions available.

Q: Are we using telehealth in the ambulance to make triage decisions?
Ed Jauch: In western NC we are not.
Mehul: There was a feasibility study in SC outfitting rural trucks with tele-EMS. It was well received though there's not a ton of evidence. It's not feasible to do.
Capt. Brown said it is not feasible in Pender County. They train paramedics to diagnose.
Ed Jauch: The experience in Charleston was not deciding triage; they provided telehealth with receiving hospital. As we get in to lower scores and more patients being triaged to thrombectomy-capable centers, it may take resources out of service for more time.

Davin McGinnis: What education is most sought after by the EMS by the hospitals? What has been

received the best and has resulted in changes of processes for the better?
Darrell Nelson: We use ASLS. EMS providers seem to like it; only complaint is it's really long.
Case studies from hospitals are really important. Cath lab pictures and reports are impactful for EMS. When stroke is not recognized is most impactful. We're seeing young people with devastating strokes. Paramedics are good at diagnosing obvious strokes. Subtle strokes, the strokes that are not obvious, are most difficult. Those cases are most impactful. Altered status patients.
Ed Jauch: What are our opportunities to share those case studies of difficult strokes?
Darrell Nelson: Leverage what we have in place with Peer Review meetings. Use them for continuing education. EMS has not adopted Morbidity/Mortality conferences as in medicine; yet, they are well received.

David Glendenning noted in the Chat that EMS loves case studies from start to finish, lectures on interventions, and up-and-coming care. Lauren Stevenson added that the Coastal market for Novant Health has completed 21 ASLS classes with for EMS/CC transport since August 2022; 302 individuals have been certified in ASLS.

Ed Jauch: What are your needs related to Stroke Systems of Care? Mehul, what research (on successes with these challenges) exists?
Mehul Patel: I think DIDO will be a problem for a long time. Evidence-based medicine puts emphasis on trials; Europeans are conducting lots of trials. Context is so important as in the Catalonia study. Location and context (how many stroke centers you have), hospital screening, and DIDO times are important. Pre-hospital screening is important but also look at door-in, door-out time.

Dr. Jauch thanked all the panelists and participants for all they are doing. He encouraged everyone to share their thoughts and ideas with Anna Bess, and we will bring it back to this group.

Questions and Discussion from Chat
Nick Galvez: Do the rural EMS counties use telestroke efficiently to administer TPA? The DHHS Office of Rural Health supports these hospitals.
A: Telestroke is widely used in NC. See the results of the stroke services survey of hospitals.
Staci Smith: Are any other EMS systems present also drawing blood pre-hospital and going door to CT scan with the pt?
A: David Glendenning posted that Novant EMS draws labs. Tom Curley added that Novant New Hanover Regional Medical Center requests regional EMS agencies draw blood prior to arrival. Donald Brown added that Pender EMS does labs for code stroke patients transporting to New Hanover. Allison Bissette noted that Johnston County completes blood draws and goes with Pt. to CT.
Shannon Chesney: Is it up to the individual county agency to pick the LVO screen, or are they hospital-dependent?
A: Jeff Williams responded: in general, counties set their own EMS protocols within the bounds set by the state protocols. That said, ideally county EMS protocols would be approved by the county's Peer Review Committee, which is where hospitals can have influence on protocols.
Robin Jones: Are any of you using telehealth to provide on-scene guidance in transfer decisions?
A: No one responded in the affirmative.
Staci Smith noted that FirstHealth of the Carolinas system uses telehealth for outlying Stroke Ready hospitals. Nick Galvez posted: the small rural hospitals send results to hospitals and ask neurology when/where to administer TPA.

Peg thanked the panelists for the work they do every day and for sharing their expertise with us. She thanked everyone for attending. She asked everyone to complete a 3-question survey to provide feedback on the meeting.
The next meeting will be held August 8th at the Division of Public Health at 5605 Six Forks Road in Raleigh. Please plan to attend. There will also be a virtual option for those who cannot travel.

2023 Stroke Advisory Council Meetings
All meetings from 1-2:30 PM

- **August 8 in the Eagle Room, DPH - hybrid**
- **November 8 – virtual**