

Acute/Subacute Area Overview/Statement of Problem

Stroke is a medical emergency, and medical attention and specialized evaluation must be provided rapidly in order to minimize disability. Optimal stroke care requires that a patient receives this evaluation and treatment within a few hours of stroke onset. Patients who come to medical attention outside of this window for treatment still require specialized care to maximize recovery (rehabilitation) and to minimize the chance of a future stroke (secondary prevention).

In 2006, the NC Department of Health and Human Services (DHHS) Division of Public Health (DPH) Heart Disease and Stroke Prevention (HDSP) Branch spearheaded the formation of the Stroke Advisory Council (SAC), a group that was tasked with working toward improving stroke care in NC. The SAC defined their long term goal to be the establishment of regionally determined, quality driven systems for delivering acute stroke care. Two of the prerequisites determined by the SAC were: 1) An accounting of the stroke capabilities of facilities in the state; and 2) Identification of systems of stroke care already present.

In 2009, the SAC commissioned the North Carolina Stroke Prevention and Treatment Facilities Survey (Goldstein, 2010) which found that only 41 percent of the state's population resides in a county with a Joint Commission certified Primary Stroke Center (PSC). Sixteen hospitals in thirteen counties were classified as PSCs at the time of the survey, which was a dramatic increase from previous surveys. Facilities in an additional 19 counties routinely used remote (telephone/telemedicine) support for the management of patients with acute stroke, and facilities in 54 counties had a policy or plan to transfer acute stroke patients outside of their capabilities to another appropriate facility. A total of 77% of the state's population resides either in a county with a PSC or in a county with a transfer plan.

However, significant gaps in stroke care still exist. The facilities survey noted that there are 25 counties without around-the-clock acute stroke care capabilities – 18 counties without hospitals and an additional 7 counties without 24/7/365 CT scanning (a prerequisite for acute stroke care). In summary, nearly 20 percent of the state's population resided in counties without an acute stroke care facility, without any facility that used remote acute stroke care support, or without EMS transfer plans/policies to take stroke patients to a secondary or tertiary stroke capable facility. The greatest lack of stroke care resources is found in rural portions of the state, primarily in the east and southeast (Appendix F, NC Maps for Telestroke). Providing access to acute stroke care for all citizens of North Carolina must remain a top priority for state leadership.

Effective January 2010, the North Carolina Office of EMS (NC OEMS) implemented an EMS Stroke Triage and Destination Plan requirement for all EMS providers (Appendix D). The Destination Plan designates where stroke patients should be taken, based on availability of stroke

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care services. Hospitals that are not PSCs are evaluated by local EMS providers and categorized as either a Stroke Capable Hospital, a Community Hospital, or a Specialty Care Transport Program (Appendix F, Map of Primary Stroke Centers). At this point, there is no centralized state mechanism for verifying the stated capabilities of hospitals nor do the designations address the actual quality of stroke care during the hospitalization. In addition, the Destination Plan does not have guidelines for connecting hospitals for rapid secondary referrals to PSCs as secondary referrals are determined by hospitals and emergency rooms. Finally, the hospital designations are not widely available to the general public for review and commentary. Although the NC OEMS EMS Stroke Triage and Destination Plan makes great strides in minimizing treatment delays, research has demonstrated that less than 40% of stroke patients are brought to emergency departments via EMS. As such, the possibility remains that acute stroke patients may be brought to those hospitals that are not equipped to provide appropriate acute care for stroke.

A number of “stroke networks” have been identified in NC. Some of the networks are defined by geography, such as the Western North Carolina Health Network (a collaboration of 17 hospitals) and the Eastern North Carolina Stroke Network (www.encsn.org) (comprised of hospitals supporting a 30-county area). These networks are seen more as resource networks, helping each other to develop stroke programs along with conducting Advanced Stroke Life Support (ASLS) classes, stroke screening, and prevention and awareness efforts. While these two groups support a large portion of the rural and geographically challenged counties, they do not meet the criteria for formal integrated systems of stroke care. Other networks identified by the SAC are organized within private health care systems or around academic centers. Such hospital system networks are fairly exclusive, leaving certain hospitals in the same region without access to network resources. Overall, stroke care in NC remains fragmented.

Emergency evaluation and treatment of stroke patients is only a portion of the care provided during the acute hospitalization. Equally important are the efforts taken to reduce stroke-related complications, to begin secondary stroke prevention, and to provide stroke rehabilitation services. Primary stroke centers must demonstrate certain standards in these care areas, but such expectations are not generally applied to non-PSC hospitals. Organizations including the Joint Commission, the American Heart Association, and the National Quality Forum (NQF) have advocated for the use of core measures in determining the quality of stroke care delivered by hospitals.¹² Importantly, the Center for Medicare and Medicaid Services (CMS) has announced the inclusion of the eight NQF-endorsed stroke measures as part of the Reporting Hospital Quality Data for Annual Payment Update initiative (CMS 2010). As such, all hospitals in North Carolina will soon be required to participate in reporting quality measures for stroke care. It is difficult to determine each hospital’s state of preparedness as the Facilities Survey was reported by county, not by hospital.

¹² www.jointcommision.org/stroke/.

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In conclusion, there have been many advances in North Carolina's efforts to provide timely and appropriate acute stroke care to all of its citizens. However, many gaps still exist, as one in five North Carolinians still have little or no access to such care. Clearly, coordinated systems of care will help to fill in the gaps, but perhaps instituting more basic measures should be the goal during the first phase of future efforts. The following recommendations are ones that the Acute/Subacute Work Group feels are necessary as the foundation for establishment of regionally determined, quality driven systems for delivering acute stroke care.

Recommendations

Stroke is a medical emergency. Medical professional guidelines dictate that stroke treatment should be provided in the timeliest manner possible. To that end, health departments and hospitals should have plans in place to provide timely and efficient stroke care. Recommendations include:

1. Every hospital in NC should have stroke plans that are comprehensive in scope. These plans should be designed to minimize delays and uncertainties concerning appropriate treatments:
 - a. Acute stroke plans should include:
 - i. Emergency Department evaluation to determine candidacy for treatment with IV tPA
 - ii. Protocols for transferring patients to facilities providing higher levels of care, if needed. Examples of higher level needs include:
 - a) Interventional stroke care
 - b) ICU stroke care
 - c) Neurosurgery
 - b. Once a stroke patient is admitted to the hospital, care plans should include strategies to reduce stroke-related complications, to begin secondary stroke prevention, and to provide stroke rehabilitation services.
 - c. For those hospitals that do not have all of the resources needed to treat acute stroke patients, plans should include emergent transfer protocols to hospitals with higher capabilities. These transfers should take place with minimal delays. Such hospitals should ensure that EMS agencies serving their region know that the NC OEMS categorizes their hospital as a "community hospital" for purposes of following the EMS Stroke Triage and Destination Plan.
 - d. For facilities with CT capabilities but lacking medical expertise, plans should include telephone, televideo, or teleradiography consultation with higher level stroke centers to facilitate treatment with IV tPA prior to transfer.
2. Each county government should have knowledge of the acute stroke plans of the county's EMS providers and hospitals and should know which NC OEMS definition each hospital meets within the EMS Stroke Triage and Destination Plan. Such information should be made available to all citizens in the county:

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- a. The current Facilities Survey reports stroke care capabilities by county, not by individual hospital. It is recommended that a new survey system be instituted whereby hospitals report their acute stroke capabilities to the NC Hospital Association (NCHA) and NC Department of Health and Human Services, Division of Public Health, Heart Disease and Stroke Prevention Branch (DHHS/DPH/HDSP), and the information for each hospital is publicly available. This system will require assistance from the NCHA to garner support and cooperation from hospitals.
3. The state should adopt a designation standard for determining the stroke care capabilities of each hospital that is not a PSC. Adopting such a standard will help the state determine which hospitals require additional resources. Such a standard will also help hospitals perform needs assessments to ensure that they are providing stroke care according to accepted guidelines. Any statement of stroke capability must include elements of rehabilitation and secondary prevention:
 - a. Determine the process for defining NC's hospital designation standards for stroke capabilities. For example, the state could convene an expert panel to provide recommendations. As part of the process, the panel should review definitions that currently exist, including those from the Brain Attack Coalition, the Joint Commission, and the American Heart Association. In addition, the panel should review definitions used by other states.
 - b. The state should work with the NCHA to garner support from hospitals to support the definitions/designations.
4. All collected information from state surveys should be utilized by the SAC and DHHS/DPH/HDSP to continue to identify and target specific regions in need of additional resources. The SAC should evaluate this information to develop strategies to target underserved regions.
5. The state should work to identify strategies to improve the hospitals in underserved areas:
 - a. Stroke referral networks should be used as resources for hospitals in underserved areas.
 - b. Regional HDSP-driven stroke support networks should be used to provide education.
 - c. The state and academic stroke centers should provide assistance with stroke care protocols to improve stroke hospitalizations.
6. Efforts should be made to work with all hospitals in the state to improve the quality of stroke care within the framework of the new NQF/CMS requirements:
 - a. The state should work with the NCHA to inform hospitals of these measures as all hospitals will be expected to comply with reporting requirements for them.
 - b. The state and the NCHA should provide resources to help hospitals prepare for reporting of these measures.
 - c. The NCSCC and the AHA/ASA Get With the Guidelines – Stroke programs should be used as resources to assist hospitals in this regard.
7. A Governor's Stroke Summit (Appendix G, Proposal for Governor's Summit on Coordinated Stroke Care) is currently in the planning phase. This Summit seeks to bring together representatives from all hospitals in the state to discuss ways to improve stroke care for the citizens of North Carolina:
 - a. The Acute/Subacute Work Group supports this Summit as a means of endorsing and establishing the above recommendations.

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8. Endorsement by the NCHA and medical professional societies are necessary for successful implementation of the recommendations. It is recommended that the state seek endorsement by the following stakeholders:
 - a. NCHA
 - b. Academic medical centers
 - c. AHA/ASA
 - d. NC Medical Society (NCMS)
 - e. NC Neurological Society
 - f. NC College of Emergency Physicians

REFERENCES

Centers for Medicare and Medicaid Services. Possible new quality measures for the FY 2010 payment determination. Fed Reg. 2009; 74: 43873.

Goldstein, L.B., Statewide Hospital-based Stroke Services in NC: Changes over 10 years. Stroke 41(4):778-783, 2010.

NC Office of Emergency Medical Services. EMS Stroke Triage and Destination Plan 2010.

APPENDICES

NC Maps for Telestroke

Proposal for Governor's Summit on Coordinated Stroke Care