The Need for Support of Stroke-Ready Certification in Rural United States: An Overview

Stacey Lang (RNS, BSN), Therese Poland (RN, BSN, MSN), Laura Owens (RN MSN MA MBA CCRN CRRN).

While much progress has been made in and around most well-populated areas of the United States with respect to access to formal stroke systems of care, similar success in rural communities lags behind. What follows is a high level overview of the challenges associated with Stroke Program development in the rural setting. Solutions to the issues identified are likewise presented for consideration.

The positive impact of a programmatic approach to the care of the stroke patient in terms of increased t-PA utilization, improved patient outcomes, and enhanced access to care has been widely demonstrated since the adoption of a formal approach to stroke program certification over 10 years ago. Early efforts focused on those hospitals that had sufficient physician, clinical, and internal resources to care for the patient through the administration of t-PA and subsequent admission. Fortunately, the development of additional levels of certification provides the structure necessary to support rural stroke providers in their efforts to improve access to care.

Three types of certifications exist for hospitals specific to care of the acute stroke patient, each supported by guidelines developed by the American Heart Association/the American Stroke Association (AHA/ASA): **Stroke Ready Certification**, **Primary Stroke Certification**, and **Comprehensive Stroke Certification**.

Certification confirms to emergency medical services (EMS) that a hospital is prepared to provide emergent care to an acute stroke patient (7). Two renowned certifying bodies are the Healthcare Facilities Accreditation Program (HFAP) and The Joint Commission.

Stroke Ready Centers are hospitals that comply with and sustain benchmarked standards of care for the acute stroke patient, including the administration of t-PA, the only FDA-approved drug for treatment of the acute non-hemorrhagic stroke victim. The Brain Attack Coalition recommends that Acute Stroke Ready hospitals stabilize the patient and use a “drip and ship” model of care (5). The window of treatment time is three hours from symptom onset.

Primary Stroke Centers are hospitals that meet and sustain the same benchmarked standard of care as Stroke Ready Centers, though patients remain onsite for care, including assessment, evaluation, and treatment post thrombolytic administration. This inpatient treatment phase is intended to identify and treat patient-specific risk factors, prevent complications associated with t-PA administration and stroke, and deliver patient-specific education and clinical follow-up.

Comprehensive Stroke Centers meet the same standards as Primary Stroke Centers, but also include the ability to provide neuro interventional therapies such as intra-arterial lytics and clot retrieval. These programs must also sustain benchmarked standards specific to neurovascular and neurosurgical interventions.

Challenges

Distance and timely access to appropriate treatment, lifestyle, risk factors, and comorbidities are all key factors in stroke mortality rates. Access to safe and high-quality care is essential to positive patient outcomes (1&5), thus people who live in rural areas are unfortunately at higher risk for substandard care, poor outcomes, and disability as a result of a stroke.

In 2008, the AHA/ASA conducted a study about the rural-urban disparities in stroke care for the northwest territory of the U.S. The results showed that half of the population in that area lives within a 90-minute radius of a hospital capable of providing acute stroke care, including the administration of t-PA (1). A recent study in

Montana revealed a similar result: Up to 50% of the population in the state has an over-60-minute transport time to a primary stroke center.

Consider these other state-specific examples: The Arizona Health Department study of urban disparities revealed greater than 1/3 of the state's population lives outside of metropolitan areas, with 11 of 15 counties considered rural (3). The Washington State Health Department found that rural residents have a higher stroke risk than their urban counterparts, including higher disease-specific rates overall that result in a 5 out of 10 death rate (2 & 8).

The issue of access to timely care, whether related to geography or a lack of available healthcare facilities, is compounded by challenges in the provision of pre-hospital care and transport in rural areas. Rural EMS personnel many times serve in a voluntary capacity, and are older in age than their urban counterparts (1&3). These volunteer providers may lack the necessary educational resources to keep pace with evolving care models and so may lag behind other providers in the ability to adjust to recommended changes in the care of the stroke patient. Spatial dispersion of emergency departments, logistics specific to ground transportation, and a lack of resources and trained personnel are significant barriers to the safe administration of t-PA during transport to the nearest certified stroke center.

Further, service infrastructures are pivotal in sustaining the provision of care to the acute stroke patient. Lack of emergency services, physicians, and nursing personnel trained in acute stroke, along with limited or no access to diagnostic equipment or trained personnel, plus transportation issues, and non-existent EMS and hospital protocols can become insurmountable challenges to the prompt diagnosis and treatment of the acute stroke patient and the administration of t-PA in rural areas.

Eliminating any or all of the aforementioned challenges can create additional barriers due to the expense involved. Financial burdens of increasing stroke patient care access include the expense of training personnel, the cost of equipment and transport, and securing on-site clinical neuro expertise, to name just a few. Lack of awareness is another problem in rural areas, thus funds likely need to be dedicated to raising awareness through collateral mailings, billboards, commercials, and so on. Available resources (both staff- and financial) for these tasks is an additional economic factor.

According to the Target Stroke initiative, the national rate of t-PA administration to qualified patients is 5-7%. In rural areas, the rate drops to 2-4% (10). In 'real' numbers, consider that on average, in the rural setting, only 3 patients out of every 100 who are eligible actually receive t-PA—an overwhelming number of patients who could potentially benefit from t-PA are not receiving it for one or several of the reasons above.

Implementation of a formal system of care for stroke patients is only the first step in developing a sustainable program. Challenges around ongoing staff training and competency, the requirements associated with data collection and reporting, and the ability to identify and respond to opportunities to improve patient care, require a strong and ongoing organizational commitment.

Solutions

One of the ways to mitigate some of these challenges is to encourage the adoption of Stroke Ready certification status for rural hospitals. Care in rural states should consist of an organized approach in support of Stroke Ready certification, as increasing numbers of these hospitals will have the potential to decrease the unique complexities and disparities of stroke care in rural communities. Nationwide implementation of Stroke Ready hospitals is in its infancy, though we believe this strategy is paramount for success in ensuring timely access to care for all patients affected by stroke, regardless of geographic location.

Attributes of a stroke ready hospital as certified by HFAP include:

- A stroke team trained in care of the acute stroke patient with a physician coordinator
- Stroke, lab, and neuroimaging capabilities available 7 days a week, 24 hours a day, every day of the year
- Ability to assess a suspected stroke patient within 15 minutes of arrival
- Strict adherence to protocols derived from current AHA/ASA guidelines
- Established benchmarks for care that must be met and sustained over time
- Ongoing education for EMS providers, stroke program director and team, hospital staff, and the community (5&7)

Specific states have implemented their own strategies. For instance, Montana launched a stroke initiative from 2004-2008, which included use of a stroke tool kit for EMS and rural EDs as a means to facilitate acute care for stroke. Each tool kit included standardized forms, protocols, stroke scales, bedside swallow screen, and guidelines for the administration of t-PA. Local training programs were provided to the EMS and hospital staff (4). This type of comprehensive approach to the development of stroke systems of care is one example of what is required to make meaningful changes to the way that care is delivered in the rural setting.

A fully collaborative approach, originating at the state level, can bring much needed momentum and encourage participation by rural providers to make the necessary investments in both time and resources.

Over the past 10 years, great strides have been made in the integration of telemedicine capabilities into stroke care, another potential solution in some rural areas. The technology associated with telemedicine allows remarkable accuracy for exams, along with immediate communication and consultation with stroke neurologists for rural facilities without on-site physician coverage.

A proliferation of telemedicine providers has occurred in the U.S., with significant variations in both cost and services provided. Healthcare facilities considering the implementation of telemedicine must have a clear understanding of their particular organizational needs as well as a comprehensive plan to ensure full integration. All too often, telemedicine is introduced into an organization without the necessary operational and administrative infrastructure. Failure to approach the care of the stroke patient in a programmatic fashion may lead to underutilization of telemedicine capabilities and a less than desirable impact on patient outcomes.

Recommendations

Every 40 seconds, someone in the U.S. has a stroke (NSA, 2012). Advocacy on a local, state, and Federal level is essential to ensure that stroke care is a priority. The availability of grants and research opportunities can augment the development and sustainability of stroke ready centers.

But given all the challenges and possible solutions outlined above, *Where do we go from here?* We believe that comprehensive stroke centers should consider a “hub and spoke” approach to assist in the provision of safe and quality care for the acute stroke patient to a greater radius of patients. Using a central Stroke Center “hub” with integrated and managed “spokes” in dispersed areas affords urban hospitals with the opportunity to partner on care with rural healthcare facilities.

This model has proven successful in increasing stroke awareness as well as the rates of t-PA administration. The support and collaborative relationship between hub and spoke clinicians ensures a best practice approach to stroke care without regard to location. The hub and spoke approach further provides a venue for shared educational offerings for EMS, hospital physicians, nurses, healthcare providers, and the community. Education specific to pre-hospital care; ED and inpatient care; pre-, during-, and post-t-PA care; secondary stroke prevention; medication; identification and management of stroke risk factors; and awareness of the signs and symptoms of stroke are invaluable as an initial step, either with or without the hub-and-spoke foundation. In fact, this strategy alone can work to improve stroke mortality in rural areas, as the population

needs to first recognize risk factors and symptoms so as to initiate care before it's too late. The development of protocols specific to this crucial element is fundamental to this process.

While much has been accomplished with respect to improving care for stroke patients in the United States, much work remains to be done. Continuing efforts to expand the reach of available treatments is the obligation of all stroke professionals.

References

1. Shult, W., Graff, R., Chamie, C., Hart, C., Louangketh, P., Tirschwellis, T., Okon, N., and McNamara, M. (2011). Striking Rural-Urban Disparities Observed in Acute Stroke Care Capacity and Services in the Pacific Northwest: Implications and Recommendations. *Stroke*, 41:2278-2282.
2. Washington State Department of Health. (2010). Rural Disparities in Mortality: Fact Sheet. *Washington Department of Health*, 346-022.
3. Miley, M.L., Demaerschalk, B.M., Olmstead, N.L., Kiernan, T.J., Corday, D.A., Chikani, V., and Bobrow, B.J. (2009). The State of Emergency Stroke Resources and Care in Rural Arizona: A Platform for Telemedicine. *Telemedicine and e-Health*, 15 (7); 691-699.
4. Okan, N.J., Fogle, C.C., McNamara, M.J., Oser, C.S., Dietrich, D.W., Gohdes, D., Harwell, T.S., Rodriguez, D.V., Helgerson, S.D. (2010). Statewide Efforts to Narrow the Rural–Urban Gap in Acute Stroke Care. *American Journal of Preventative Medicine*. 39 (4) 329–333.
5. Alberts, M.J., Wechsler, L.R., Lee Jensen, M.L., Latchaw, R.E., Crocco, T.J., George, M.G., Baranski, J., Bass, R.R., Ruff, R.L., Huang, J., Mancini, B., Gregory, T., Gress, D., Emr, M., Warren, M., Walker, M.D. (2013). Formation and Function of Acute Stroke–Ready Hospitals within a Stroke System of Care Recommendations from the Brain Attack Coalition. *Stroke,* 44:00-00.
6. Tsai, A.W. (2012). Minnesota Acute Stroke System. *Minnesota Department of Health*.
7. Healthcare Facilities Accreditation Program. (2013). Stroke Ready Certification. *Healthcare Facilities Accreditation Program.*
8. Leira, C.L., Hess, D.C., Torner, J.C., and Adams, H.P. (2008). Rural-Urban Differences in Acute Stroke Management Practices: A Modifiable Disparity. *American Medical Association*, 65(7); 887-891.
9. Research Center for Stroke and Heart Disease. (2006). Stroke and Heart Disease Facts and Statistics for Western New York. *The Jacobs Neurological Institute*.
10. Nelson, R.E., Hicken, B., West, A., and Rupper, R. (2011). The effect of increase travel reimbursement rates on health care utilization on the V.A., *The Journal of Rural Health, 28*(2), 192-201.