

THE NORTHERN STROKE ALLIANCE

Northern Neurosciences, Inc.

PROJECT BACKGROUND AND RATIONALE



Introduction

The Northern Stroke Alliance initiative supports the development of telemedicine networks that will provide a continuously-available, real-time consultation service from stroke-specialized neurologists to underserved hospitals for the provision of emergency stroke healthcare. In particular, the Northern Stroke Alliance intends to maximize the appropriate use of “clot busting” thrombolytic medications (tissue plasminogen activator [t-PA]), which is known to improve clinical outcomes and reduce healthcare expenditures in acute stroke patients.

Experiences with Stroke Telemedicine

Several telemedicine networks have proven to increase t-PA use for acute stroke in underserved rural and small community hospitals. The cornerstone of these stroke telemedicine systems is bidirectional voice and video communication coupled with the ability to transmit neuroimaging studies (i.e., a CT scan of the brain) from the underserved hospital to the stroke neurologist. Video conferencing between the physician who is taking care of the acute stroke patient at the underserved hospital and the off-site stroke neurologist has been demonstrated to provide accurate assessments of the patient’s physical condition ¹ and the patient’s neuroimaging studies ², both of which are necessary in order to appropriately administer t-PA.

Examples of existing stroke telemedicine networks include the following:

- 1) Massachusetts: In a rural island community hospital that had not used t-PA a single time over a 24 month lead-in period, implementation of a telemedicine connection with the stroke neurologists at the Massachusetts General Hospital increased the use of t-PA to 5.6% of acute stroke admissions. Under the guidance of the stroke neurologists, the use of t-PA at the underserved hospital was as safe as it was at the Massachusetts General Hospital itself, and no deaths were reported over the 27 month study period. ³ Since this initial demonstration, their stroke telemedicine network has grown to involve nearly 10 hospitals in Massachusetts.
- 2) Bavaria, Germany: After institution of a telemedicine network linking 12 underserved hospitals with two academic stroke centers, the use of t-PA in the underserved hospitals increased approximately ten-fold to nearly 30% of all acute stroke admissions. The rate of complications from t-PA treatment in the underserved hospitals was comparable to that of the academic stroke centers and was much better than that of community hospitals that did not have access to the expertise of stroke neurologists. ⁴

- 3) Georgia: Seven rural hospitals improved their t-PA use from “nonexistent” to a combined single-year total of 75 acute stroke patients after establishing a telemedicine network with the stroke neurologists of the Medical College of Georgia. This stroke telemedicine network was so successful that 15 other hospitals were planning to join it over the subsequent two years.⁵
- 4) Maryland: Use of a video conferencing connection between a community hospital emergency department and the University of Maryland was associated with a 24% rate of t-PA use in acute stroke patients. No complications were noted in a retrospective review of the medical charts from the t-PA-treated patients.⁶ This service has been so successful that video conferencing capabilities have even been built into the city’s ambulance system on a trial basis.

Additionally, in the aforementioned examples of stroke telemedicine, communication with the stroke neurologist was generally achieved within 10 minutes and the stroke neurologist’s evaluation was completed within 15 minutes^{1,3,5}. In support of these impressive results, the physicians who actually used the stroke telemedicine systems greatly valued the service. For example, the Massachusetts telemedicine system has been endorsed by 96% of the emergency room physicians who used it and the service was thought to improve patient care in 100% of cases³.

These examples demonstrate that stroke telemedicine can direct the effective and safe use of t-PA in rural small community hospitals that do not have an on-site stroke neurologist or even a general neurologist. Comparing the reports of t-PA use from these examples against the national average for community hospitals (1.6%⁷), it should be clear that there is no reason that this valuable treatment cannot be used effectively in underserved hospitals when the appropriate guidance is available.

Other Benefits of Stroke Telemedicine

Other than the obvious benefit of improving the healthcare of patients who are suffering from acute stroke, there are additional reasons to consider developing telemedicine networks:

- 1) The Center for Medicare and Medicaid Services recently decided to reimburse healthcare providers for acute stroke care in a manner that depends upon whether or not the patient was treated with t-PA. This summer, the reimbursement for an acute stroke patient who receives t-PA was increased to nearly \$12,000 in comparison with the \$4,000-6,000 that is reimbursed for a stroke patient who does not receive t-PA. Maximizing the appropriate use of t-PA should then increase reimbursement particularly when one considers that t-PA treatment also shortens the length of hospitalization and reduces other healthcare expenditures⁷.
- 2) Government regulations may ultimately require the routing of acute stroke patients to hospitals that can offer them t-PA. Such policies have recently been instituted on the state level in New York, Massachusetts, and Florida, and on the national level by JCAHO

certification. Hospitals that are unable to provide such a fundamental emergency stroke therapy as t-PA may then ultimately lose stroke patients to other hospitals.

- 3) The Northern Stroke Alliance will work with hospitals that participate in telemedicine networks to develop written guidelines for the management of stroke patients throughout the hospitalization. Such ‘stroke pathways’ have by themselves been shown to reduce in-hospital morbidity and length-of-stay (reviewed in ⁹).
- 4) One of the chief legal liabilities related to t-PA therapy for stroke is when the medication is not administered to the appropriate patient. Some emergency room physicians understandably are reluctant to administer t-PA because they lack experience diagnosing stroke, and this is reflected in the lack of support that t-PA therapy has received from emergency medicine governing bodies ⁸. Many neurologists who trained before t-PA became available also are unfamiliar with t-PA’s indications and thus are unable to provide this treatment. Even in hospitals where neurologists are available and responsive to acute stroke calls, often the neurologist is unwilling to administer t-PA because he or she is uncomfortable with it. By relying on experienced stroke neurologists in the emergency treatment of the acute stroke patient, this hesitation and its consequent legal liability largely should be avoided.
- 5) While stroke telemedicine networks have generally reduced the need for transferring stroke patients to tertiary medical centers (particularly by expensive modes of transportation such as helicopter), the use of a stroke telemedicine network would undoubtedly facilitate the necessary transfer of patients to a tertiary medical center. This, in fact, was considered one of the hallmarks of the successful German stroke telemedicine network ⁴. Additionally, the stroke neurologists that provide the on-call service will be based in Michigan’s academic medical centers. Thus, the stroke neurologist who would be accepting the stroke patient upon transfer would also be involved with the patient’s initial management at the underserved hospital, thereby providing continuity-of-care.
- 6) Efficient use of t-PA in acute stroke management is increasingly becoming a marker of hospital quality. Since the number and distribution of both acute stroke patients and stroke neurologists obviously does not allow for a uniform and continuous provision of this vital service on-site in every hospital, the National Institute of Neurological Disorders and Stroke (NINDS) has endorsed the use of telemedicine to improve the use of t-PA in acute stroke to underserved areas ¹⁰.

Staffing

Neurologists who have completed the newly-developed fellowships in vascular / stroke neurology or else who have significant preexisting experience in managing stroke patients will provide the consultative service. All neurologists will be appropriately board certified and will be fully licensed to practice in Michigan. These neurologists will provide continuous coverage of acute stroke cases for the hospitals that participate in the network.

Within the participating hospital, this service should be directed - but not limited - to the emergency medicine department. Some training for the personnel who are expected to use this service would certainly be necessary to ensure familiarity with the video conferencing equipment. This should include emergency medicine physicians, emergency department nurses, and radiology technicians.

Importantly, strokes often occur in patients who are already in-hospital. Thus, provisions should be made on-site to make the telemedicine service available to all the hospital's physicians. Since video conferencing equipment is usually portable this should not pose a significant problem.

More information about the technological features and cost of participating in a model telemedicine network can be found in our "Business Plan for Hospitals", which is available at our website, www.northern-neurosciences.com.

Summary

Participation in a stroke telemedicine network will not only put your hospital in the position of being involved in a cutting-edge telemedicine service but also will improve Michigan's image in the healthcare realm. Most importantly, however, your hospital will be a part of improving the lives of stroke patients. Please feel free to contact us by any of the means listed below.

The Northern Stroke Alliance
Northern Neurosciences, Inc.
administrator@northern-neurosciences.com

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