

Moving Forward

The NHS continues to grow, with a busy year ahead. A quick rundown of a few things to keep an eye out for:

A new website! Thanks to help from the Society of Hospital Medicine, our new website is well under development. We'll plan a formal launch notification once the site is up. There will be more opportunities to interact and get a better sense of what's going on in our field.

A dedicated meeting! We're hoping to move forward with this initiative and meet this fall.

Obviously there's a lot involved in doing this and we won't do it unless it's done right. If you'd like to volunteer to help, please email Dave Freeman at freeman.williamr@mayo.edu.

New features in the newsletter! More practice profiles, literature reviews and exclamation points!

As always, please encourage others to join and if you have ideas they're more than welcome.

Email to join the society:
info@neurohospitalistsociety.org

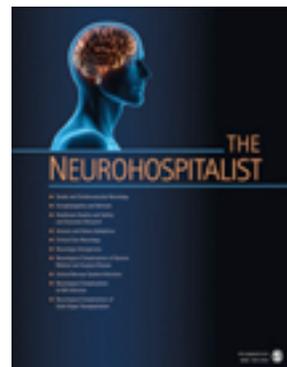
SUBMIT YOUR MANUSCRIPT TO *THE NEUROHOSPITALIST*

Please visit us online at www.neurohospitalist.org to read our latest issue. I would draw your attention to a review article on the acute management of migraine headache written by Drs. Amy Gelfand and Peter Goadsby. We also welcome the return of the Clinical Pathological Conference with two neuromuscular cases; this will now be a routine feature thanks to the fantastic efforts of Drs. Sandeep Khot and James Greene.

2012 has seen an increased number of submissions; within 3 months we have received 50% of the number of submissions we received in all of 2011. The quality continues to be high. Review turnaround times continue to be low, averaging 28 days. This bodes well for our planned application to the National Library of Medicine for indexing on PubMed at the end of 2012. Over the next year, we plan several new initiatives to make the journal more exciting and useful to our readers, including "Quality Watch," a section consisting of a series of brief reviews summarizing the most important recent articles regarding inpatient quality and safety from across the medical literature; "Neurovascular Case

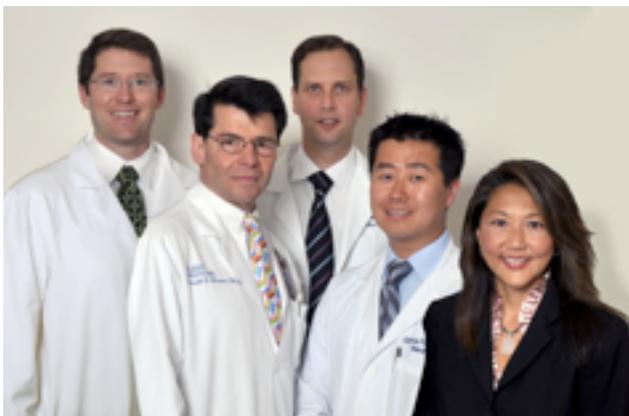
Conference," which will be a new twist of the clinical pathologic conference; and an annual prize of \$500 for the most compelling article submitted to The Neurohospitalist by a resident or fellow. Until we are indexed on PubMed, we will continue to rely heavily on the support of our editorial board and society members for submissions and for word of mouth advertising encouraging colleagues to submit articles to us. As neurohospitalists increasingly provide the bulk of inpatient neurological care, I suspect it will make progressively more sense for research articles focused on inpatient neurological conditions, quality, safety, and outcomes to find a site-specific home in The Neurohospitalist. As always we welcome your comments, letters, suggestions and feedback; please feel free to contact me anytime.

Vanja Douglas, MD



PRACTICE PROFILE: BLUE SKY NEUROLOGY PLLC

Blue Sky Neurology, PLLC was established in 2005, to provide dedicated neurohospitalist services to its principal hospital, Swedish Medical Center, in Denver Colorado. This unusual name for a medical practice was chosen to portray a brighter outlook for neurological patients than in the past. BSN has grown from 2 to 6 neurohospitalists who are boarded in stroke, neurocritical care, neurodiagnostics and neuro-ophthalmology. BSN's neurohospitalists consult on patients in the emergency department and hospital, admit and co-manage patients with intensivists in the neurocritical care unit, perform and interpret inpatient neurodiagnostic tests such as EMG and EEG, provide telestroke consultations for its partner regional teleneurology networks, and lead and participate in acute stroke clinical trials. In addition, Blue Sky Neurology has expanded "on the ground" coverage to include several of the Denver metropolitan hospitals in the HealthOne and Exempla systems. By contracting with hospitals to provide services, BSN has been able to



continue to grow in a fully private practice environment.

In 2007, Blue Sky Neurosciences PLLC was formed as an umbrella managing organization for its two divisions; the original Blue Sky (Inpatient) Neurology division, and the newly formed Blue Sky Outpatient Neurology division, composed of dedicated outpatient neurologists. By forming separate entities, each division is able to contract, manage and function optimally with its unique needs in mind. Blue Sky Neurology incorporated telestroke early into its neurohospitalist practice, which lead to increased regional recognition and influence throughout Colorado and into the surrounding states of Wyoming, New Mexico, Nebraska, and Kansas. Affiliation with the Colorado Neurological Institute, a nonprofit organization dedicated to education, community outreach and research, facilitated their participation in acute stroke trials, such as IMS III, POINT, Stellar, and ENGAGE, to name a few.

The neurologists of Blue Sky Neurosciences are also actively engaged in improving the quality of inpatient neurological services at each of the hospitals they serve as medical directors, and speak and publish on regional and national levels. The vision of Blue Sky Neurosciences is to provide comprehensive neurological care from the ED to outpatient setting.

Ira Chang, MD

PRACTICE PROFILE: UNIVERSITY OF COLORADO



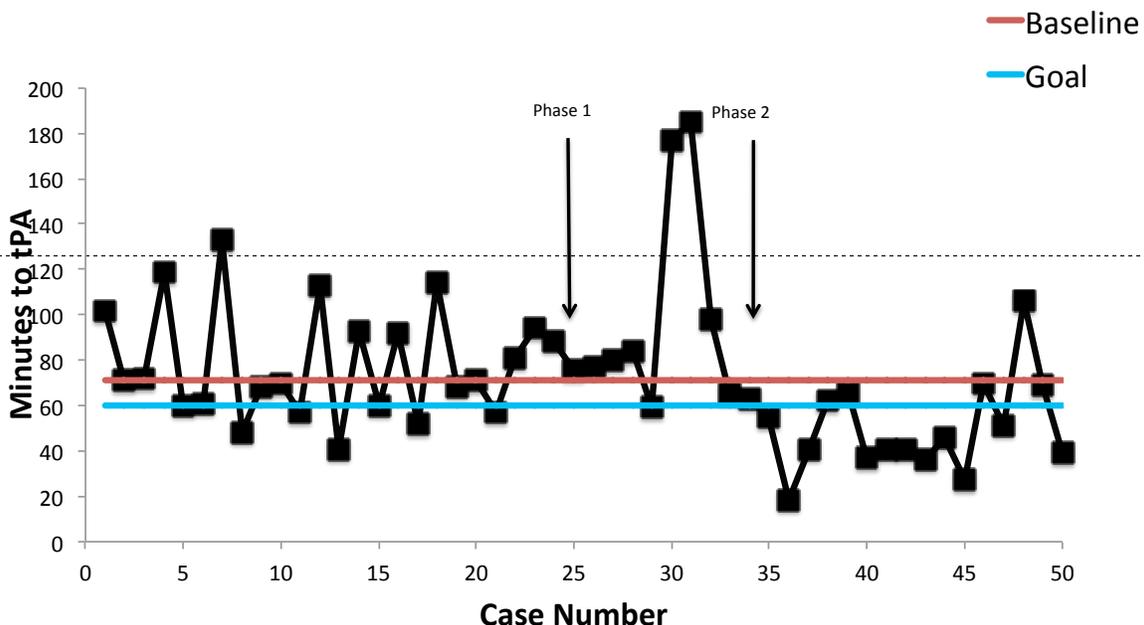
allows for each physician to be well known to the emergency department, internal medicine department, and other consulting services.

Housing the two hospitalist programs together allows for unique synergies. For example, the neurohospitalists and internal medicine hospitalists have partnered to create a quality improvement project involving acute ischemic stroke patients. “Target Stroke” was an initiative to reduce time to IV tPA treatment. The project began in July 2011, and 2 stages of intervention have occurred. The first stage changed the stroke alert criteria from 24 to 8 hours, streamlined the stroke alert protocol, added a pharmacist to the stroke alert paging system, and provided more regular feedback to the entire team involved in each patient’s care. The second stage included waving labs that are unlikely to be abnormal, placing all stroke alerts in the trauma room if possible, and expediting the CT scan. This project has been a tremendous success, and has decreased time to tPA in stroke patients, as shown in the chart below. This project was a great collaboration between the neurology and internal medicine hospitalist groups, the emergency department, pharmacy, and radiology.

The University of Colorado Neurohospitalist program commenced July 1, 2011. The program is housed within the internal medicine hospitalist program, and is modeled after that system. It is comprised of three neurohospitalists, Dr. William Jones, Dr. Matthew West, and Dr. Jennifer Simpson, and one nurse practitioner, Alex Graves. Drs. Jones and Simpson are stroke specialists, while Dr. West completed a fellowship in neuroimmunology. Each spend eight months on the inpatient service, one half day of clinic per week and has four months of “academic” time. The inpatient service is divided into stroke and general neurology teams with an attending on each service while the third attending is on academic time. Each team has a primary service as well as a consultation service. The format

Jennifer Simpson MD

Run Chart of tPA times pre and post Intervention



TENECTEPLASE VERSUS INTRAVENOUS RECOMBINANT TISSUE PLASMINOGEN ACTIVATOR (RTPA) FOR ACUTE ISCHEMIC STROKE.**NEW ENGL J MEDICINE MARCH 22 2012.****Reviewer/Author:** W David Freeman, MD**Introduction:**

The only FDA-approved therapy for acute ischemic stroke remains IV-rtPA up to 3hrs after stroke onset for those who meet the rigid NINDS study criteria [1]. Therefore, alternative stroke therapeutic studies and agents are needed to treat stroke patients especially those outside the 3hr window. One such trial [2] published in the New England Journal of Medicine is a randomized trial investigating tenecteplase (TNK), compared against alteplase (rtPA) for patients with acute ischemic stroke within 6 hours of symptom onset. One of the theoretical benefits of TNK (a genetically engineered version of tPA) is its longer pharmacological half-life compared to typical rtPA which could potentially lead to sustained recanalization and reperfusion in stroke.

Methods:

The study randomized 75 patients who presented within 6 hours of acute incident (first-ever) ischemic stroke onset to either TNK (2 different dosing groups, either 0.1mg/kg or 0.25mg/kg) or rtPA (0.9mg/kg body weight) at three stroke centers in Australia from 2008-2011. Inclusion criteria involved a baseline CT perfusion study showing a perfusion ('penumbra') lesion greater than 20% of the 'core' infarct zone, and corresponding intracranial vascular occlusion on the CT angiogram, age > 18 years, and baseline NIH stroke scale > 4, prestroke modified Rankin scale of 2 or less (higher Rankin score indicated a baseline disabled state). Exclusion criteria were the same as rtPA package insert, or if the patient did not meet imaging criteria above, or with vertebral-basilar or internal carotid occlusion. The coprimary endpoints were improvement in lesion perfusion on MRI- with perfusion weighted imaging (PWI) and post-treatment NIH stroke scale. Exclusion criteria included INR >1.5

Results:

2768 patients were screened during the study period with acute stroke symptoms within 6 hours of onset. 78% (n=2164) of patients were excluded by standardized intravenous thrombolysis exclusion criteria. Of the remaining 22% of patients, only 4.5% (n=127) met the additional imaging criteria. Also of the remaining 127 patients eligible for the study, 52 patients or the treating physicians "opted out" of the study for either open-label alteplase (n=40), or endovascular therapy (n=12), with the remainder of the patients (n=75) being randomized into one of 3 arms (n=25 each) either alteplase, 0.1mg/kg TNK or 0.25mg TNK. The TNK pooled analysis (n=50) showed superiority compared to rtPA (n=25) with respect to the primary endpoint of imaging reperfusion comparing mean percent reperfusion 79.3% (+/-28.8 SD) in TNK group compared to 55.4% (+/-38.7 SD) in the rTPA group (p=0.004), as well as the primary clinical efficacy outcome or improvement in NIH stroke scale by 24hrs (8 point improvement mean +/- 5.5 SD in TNK group) versus 3 point mean improvement in rTPA group (+/-6.3 SD), p < 0.001. There was no significant difference in hemorrhagic complications between TNK and rtPA groups. The data showed a dose-response relationship with higher dose 0.25mg/kg TNK compared to lower dose TNK and rTPA with respect to higher rates of reperfusion and drop in 24hr NIH stroke scale measurements. Secondary clinical endpoint of excellent clinical recovery was seen in the TNK group at 90 days compared to the rtPA group (p=0.02).

Take Home Points:

For the practicing neurohospitalist, what does this study mean?

TNK demonstrates a promising stroke therapeutic drug for stroke patients presenting within 6 hours from onset but these patients must meet typical IV thrombolysis criteria and specific imaging characteristics

TNK, however, must still undergo a Phase III clinical trial before widespread clinical and FDA approval

Study Criticisms:

While the study should be complimented for the study design and screening of more than 2000 patients to treat 75 patients, not all hospitals and Emergency departments have advanced neuroimaging such as CT perfusion to include such patients. However, this might change similar to IV-rtPA requiring at least a noncontrast CT in the 1995 to meet exclude intracranial hemorrhage. Also, only 4.5% of the patients screened within six hours of onset met intravenous thrombolysis and advanced CT angiogram perfusion imaging eligibility criterion. Further, MRI PWI was used as one endpoint but should be considered a 'surrogate' for a clinical endpoint but not the same, and adds more complexity to hospitals without such advanced neuroimaging. Finally, the NIH stroke scale improvement in the TNK pooled group at 24hrs suggested early clinical improvement, but this must be proven in a larger Phase III randomized trial with a clinical or functional endpoint like Rankin scale at 30 and 90 days.

Funding/Conflict of Interest:

The Australian National Health and Medical Research Council funded the study. Boehringer Ingelheim provided the TNK apparently at a discounted rate to the researchers but per the Methods section of the paper the company was not involved in study design, study conduct, analysis, or manuscript preparation. Two of the authors in the study received consultancy fees from Boehringer Ingelheim.

References:

National Institute of Neurological Disorders and Stroke (NINDS) rtPA Stroke Study Group. N Engl J Med 1995; 333:1581-1588

Parsons M et al. A Randomized Trial of Tenecteplase versus Alteplase for Acute Ischemic Stroke. N Engl J Med. 366;12:1099-1107.

Abbreviations:

FDA- US Food and Drug Administration, NINDS - National Institute of Neurological Disorders and Stroke, IV- intravenous, rtPA- recombinant tissue plasminogen activator, TNK- tenecteplase.

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Neurohospitalist & Neurocritical Care Fellowships



MAYO CLINIC

Mayo Clinic in Florida has excellent fellowship positions in the rapidly growing fields of Neurohospitalist (1 year) and Neurocritical care (2years) for 2013. These fellowships will prepare graduates in evidence-based care for a wide-spectrum of acute neurological disease. For more information please see the websites below, and if interested in applying for one of these fellowships please send your CV and personal statement to the contacts below.

Neurohospitalist website <http://www.mayo.edu/msgme/residencies-fellowships/neurology/neurohospitalist-fellowship-florida>

Contact: barrett.kevin@mayo.edu

Neurocritical care website

<http://www.neurocriticalcare.org/i4a/pages/index.cfm?pageID=4183>

Contact: freeman.william1@mayo.edu



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