



Stroke Care 2006: Critical Issues in Emergency Medicine

ED Transient ischemic Attack Patient Management: Can At-risk Ischemic Stroke Patients Be Identified?

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Learning Objectives

- Review the data that quantifies what is the risk of acute ischemic stroke in the early days following an ED visit for an acute transient ischemic attack.
- Discuss how those TIA patients who are at greatest risk for a subsequent ischemic stroke can be identified and optimally managed in the ED.

Background

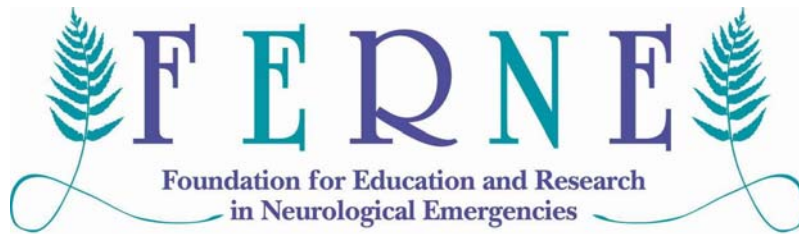
Since the *JAMA* publication of the Kaiser-Permanente data that suggests that there is significant short-term risk of acute ischemic stroke following the ED presentation for an acute transient ischemic attack, there has been much discussion as to how this risk can be best quantified and minimized. Although the data could be interpreted to mean that all TIA patients must be admitted following an ED TIA presentation, others have examined this data and concluded that the risk does not necessarily warrant admission for all ED TIA patients as long as risk stratification and a nominal workup can take place in the ED.

The ability to safely disposition TIA patients home from the ED relies upon the ability to successfully stratify patients based on demographic and clinical factors obtained during the initial ED evaluation. Exactly which patients are at sufficiently low risk is the important question. Can we assess that a patient is at low enough risk that an outpatient evaluation is appropriate following an ED evaluation for TIA symptoms? If so, which clinical factors suggest a low enough risk of subsequent ischemic stroke to merit this disposition decision?

Key Clinical Questions

What is the short-term risk of an acute ischemic stroke following a TIA that is diagnosed in the ED?

Can those patients who are at greatest risk for an ischemic stroke following a TIA be identified based on clinical and diagnostic factors such that their ED management and disposition can be optimized?



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ED Transient ischemic Attack Patient Management: What Role for Outpatient Evaluation and Disposition?

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Learning Objectives

- Discuss the results of the Ross study that suggest that an outpatient evaluation of ED stroke patients can be safely conducted.
- Determine what diagnostic and therapeutic evaluations must take place in order to safely discharge ED TIA patients home for outpatient follow-up.

Background

Ross conducted a EMR/FERNE supported study that evaluated the utility of an observation unit evaluation of ED TIA patients as compared to a traditional hospital evaluation. The study results, which were presented at the 2006 SAEM meeting, suggest that patients can safely be discharged from the ED following a structured clinical evaluation. This research, incidentally, won the award for the best clinical presentation at this year's meeting.

Because it appears that it is possible to successfully evaluate and treat ED TIA patients as outpatients, the questions that follow are: What tests and treatments must be conducted prior to discharge, and which patients must be admitted based on positive findings from the initial ED evaluation?

Key Clinical Questions

What is the expected outcome of ED TIA patients who are evaluated and treated in an outpatient observation unit based on the Ross study?

What diagnostic and therapeutic evaluations must take place in order to safely discharge TIA patients home from the ED for outpatient follow-up?



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Stroke Care within the 3 Hour Window for IV tPA Use: Why tPA? And if Not, What Alternatives?

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Learning Objectives

- Discuss the current optimal use of IV tPA given the NINDS clinical trial data, the reanalysis of this data, and the presence of phase IV data that confirms its clinical effectiveness.
- Determine if there are other therapies that might be utilized during the initial ED evaluation of stroke patients who are within the first three hours but who may not qualify for IV tPA use.

Background

Despite the presence of clinical trials data and phase IV data that has demonstrated the clinical efficacy and the clinical effectiveness of tPA in treating ischemic stroke patients, the Emergency Medicine community still actively debates the utility of this therapy in the ED. The initial NINDS results were published 11 years ago, demonstrating clinical efficacy. There have been over 12 publications demonstrating comparable results in the clinical setting suggesting clinical effectiveness. The NINDS data was reanalyzed, and in fact demonstrated comparable efficacy even when considering baseline stroke severity. Given that IV tPA is considered by many to be the standard of care in 2006, how can this therapy be optimally utilized by emergency physicians? What documentation must take place when using or not using IV tPA in the acute setting?

Even in institutions where IV tPA is utilized, there are patients for whom IV tPA use may not be clinically indicated. What are the options for these patients, and do they differ from the options that exist for stroke patients who are treated after the three hour IV tPA window? What should EM physicians do when treating these early symptom onset ischemic stroke patients who do not qualify for IV tPA?

Key Clinical Questions

What is the optimal use of tPA given its reported efficacy and clinical effectiveness?

If stroke patients present within three hours from symptom onset, but do not receive IV tPA, what other therapies should be considered in order to improve outcome?



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Stroke Care after the 3 Hour Window for IV tPA Use: What are the Diagnostic and Therapeutic Options?

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Learning Objectives

- Discuss what diagnostic modalities should be used in the diagnosis of acute ischemic stroke who are treated greater than three hours after symptom onset.
- Determine the role of pharmacologic, interventional radiology, and operative techniques in the management of ischemic stroke patients after the three hour IV tPA window.

Background

There have been numerous advances in the acute diagnosis of patients with acute ischemic stroke. The availability of CTA, MRI, MRA, as well as traditional cerebral angiography may allow the diagnosis for stroke to be made more accurately, and also may allow for therapeutic modalities to be used more effectively and efficiently based on the findings of these neuroimaging techniques. How have these new modalities changed the way in which we diagnose or should diagnose acute stroke patients in the ED, especially those who are being treated after the three hour IV tPA window?

Additionally, devices such as the mechanical clot removal device have been FDA approved as a therapeutic modality for the treatment of acute ischemic stroke patients. Other devices are being studied that may enhance perfusion of the ischemic penumbra. However, how and when patients should be directed to these and other pharmacologic interventions and operative intervention remains uncertain. What should Emergency Medicine physicians know about these new therapies and interventions so that they can appropriately obtain consultation and plan disposition for ED ischemic stroke patients so as to minimize ischemic stroke volume and maximize patient outcome?

Key Clinical Questions

What are optimal neuroimaging modalities when evaluating acute ischemic stroke patients who may not qualify for IV tPA or whose symptoms have exceeded the three hour IV tPA window?

What pharmacologic, interventional radiology and operative techniques should be considered when managing stroke patients who do not receive IV tPA or present late after symptom onset?



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Stroke in the Prehospital and ED Settings: When Should EMS triage & Inter-hospital Transfer occur?

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Learning Objectives

- Discuss if and when direct EMS triage to specialized stroke centers should take place.
- Determine under what circumstances the inter-hospital transfer of ischemic stroke patients should take place when specialized stroke patient care is desired.

Background

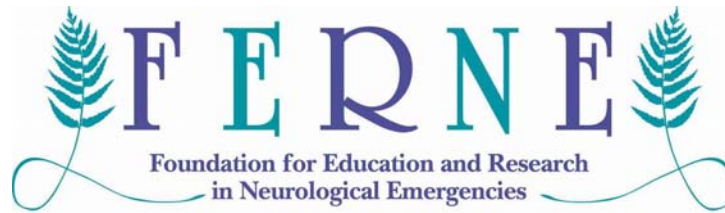
In order to optimize the care of stroke patients, primary stroke center certification has been established by the JCAHO. In addition to these centers, there currently exist tertiary medical centers that provide specialized stroke care, and there are plans to certify comprehensive stroke centers. Given that these resources exist, the question arises whether or not stroke patients should be triaged directly from the prehospital setting to these specialized stroke care institutions. Surrounding this questions are issues such as the ability to identify stroke patients accurately, the potential benefit of the triage, and the financial and systems implications of the triage process. Already some governmental agencies have established that this triage take place, and research has suggested benefit from this practice. What should be the future of the EMS triage of these stroke patients?

When stroke patients are not triaged to specialized stroke centers but are instead treated in hospital EDs that are staffed by emergency physicians, when should stroke patients be transferred to another institution because of the availability of advanced diagnostic and treatment modalities that may improve outcome? This is another important stroke patient and stroke system question.

Key Clinical Questions

When and why should stroke patients in the EMS setting be triaged to specialized stroke centers?

When should inter-hospital transfer of stroke patients from EDs to specialized stroke centers occur?



Stroke Care 2006: Critical Issues in Emergency Medicine

Stroke Patient and New Stroke Therapies Assessment: ED NIHSS Use & Stroke Scales Use in Assessing ED Stroke Therapies

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Learning Objectives

- Discuss how the NIHSS should be utilized by emergency physicians in assessing ischemic stroke patients in the Emergency department.
- Determine what emergency physicians need to know about stroke scales when evaluating stroke therapies that could be utilized in treating ED ischemic stroke patients.

Background

Although the NIHSS is the accepted industry standard for evaluating stroke patients, its use in the ED is variable. Lack of expertise, the time it takes to complete it, and poor understanding of how it influences decisions such as the use of tPA in treating acute ischemic stroke patients all impact its utility in the ED. Because the NIHSS was utilized to assess tPA use in the NINDS clinical trial, and because stroke neurologists communicate stroke severity using this scale, it is important to fully understand how the use of this scale can be optimized in the ED.

Equally important is having an understanding of how to utilize scales such as the Barthel Index (BI) and Modified Rankin Scale (mRS) when assessing stroke therapies that can be used in the ED. For example, it is possible using data from the NINDS clinical trial of tPA to assess how many patients will have the best clinical outcome following tPA use as compared to the number that might sustain a symptomatic ICH. This “number needed to treat” data is important as ED physicians consider the use of all stroke therapies in the managing ED stroke patients.

Key Clinical Questions

What is the role of the NIHSS in the ED evaluation and treatment of ischemic stroke patients?

How can other stroke scales be simply utilized by EM practitioners in order to assess the clinical effectiveness of all available ED ischemic stroke therapies?



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Optimal Emergency Department Neuroprotection Strategies in Acute Ischemic Stroke Patients

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Learning Objectives

- Review the current state of neuroprotection strategies that limit the extent of secondary injury following acute ischemic stroke.
- Discuss the possible role of neuroprotectants such as NXY-059 in the treatment of ED ischemic stroke patients based on the methods and preliminary results of the SAINT I and SAINT II clinical trials.

Background

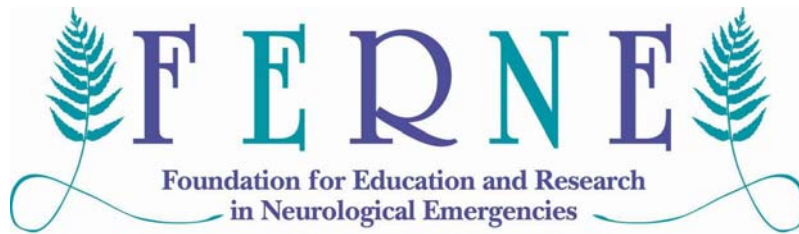
Efforts to maximize neuroprotection in the care of patients with CNS illness and injury have yielded variable results. Although some stroke patient clinical guidelines address how secondary injury can be prevented, the development of direct neuroprotectants has remained elusive. This session will review how secondary brain injury can be avoided through the use of strategies such as glucose and blood pressure control, airway and ICP management, as well as the potential role of hypothermia in treating these patients.

The development status of direct neuroprotectants that may be of value in the acute setting such as NXY-059 will also be discussed in this session. The methodology for analyzing the results of the SAINT I and SAINT II clinical trials as well as the preliminary results will be addressed in order to better understand how ED ischemic stroke patient care might be influenced as a result of this work. Examination of number needed to treat data may help to provide perspective on this and other potential CNS neuroprotectants.

Key Clinical Questions

What neuroprotection strategies are useful in preventing secondary brain injury following stroke?

What information can be gleaned from the SAINT I and II clinical trials regarding CNS neuroprotectants such as NXY-059?



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The Diagnosis of SAH in ED Headache Patients: What Roles for CT Neuroimaging & Lumbar Puncture?

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Learning Objectives

- Review the optimal way in which the clinical evaluation, diagnostic testing, and treatment of Emergency Department patients with acute cephalgia and suspected SAH can be conducted.
- Discuss the role of lumbar puncture in patients whose SAH risk is limited and in whom the initial non-contrast CT is negative for subarachnoid blood.

Background

One of the critical requirements of the emergency physician is to be able to efficiently diagnose and effectively treat patients who present to the Emergency Department with acute cephalgia and suspected SAH. This lecture will highlight the physical examination and diagnostic evaluation of these patients, including the need for CT neuroimaging and subsequent lumbar puncture.

This presentation will also address important issues such as what is to be considered a traumatic lumbar puncture, when a lumbar puncture might be deferred or need to be repeated, and what can be concluded from the fact that a patient's headache has resolved as a result of the ED interventions.

Lastly, a look at the ACEP clinical policy on the management of ED headache patients will be conducted in order to better understand how these ED patients might be optimally managed.

Key Clinical Questions

What is the optimal way in which Emergency Department patients with acute cephalgia and suspected SAH can be evaluated and treated based on current guidelines?

What is the role of lumbar puncture in patients whose SAH risk is limited and in whom the initial non-contrast CT is negative for subarachnoid blood?



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ED Hemorrhagic Stroke Patient Management: What Roles for Operative Intervention & Factor VIIa?

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Learning Objectives

- Discuss the potential role of operative intervention in acute ICH patient management given the results of the STICH operative intervention clinical trial.
- Determine the optimal protocol for and the possible role for Factor VIIa in the ED management of ICH patients, especially in the setting of an elevated INR due to warfarin use.

Background

The need for operative intervention in the acute management of ED ICH patients is of critical importance, especially given the lack of uniform neurosurgical coverage in the United States. Which patient might benefit from operative intervention is also important given that outcomes can be poor in patients whose hemorrhages are large and are associated with a poor GCS. The data from the STICH trial suggest that operative intervention may not dramatically benefit ICH patient outcome, such that its use might be limited to a select population of ED ICH patients. This conclusion, however, may not apply universally to all ICH patients given the methods and results of the study, suggesting the need for further discussion of the results and their impact on clinical practice.

Many ICH patients sustain a cerebral hemorrhage because of the concomitant use of warfarin, requiring that the ED management include normalization of an elevated INR. How this should take place, based on what guidelines and with the use of products such as Factor VIIa is of importance as EM physicians acutely manage ED ICH patients.

Key Clinical Questions

What is the role of operative intervention in ICH patients given the results of the STICH trial?

What is the optimal protocol for the management of ICH patients and the potential role for factor VIIa given in anti-coagulated patients?