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<tr>
<td>Shikshya Baral</td>
<td>Biology with Concentration in Microbiology</td>
<td>Stroke Nurse as Part of the ICH/SAH Team</td>
<td>• Stroke nurses are crucial members of the ischemic stroke team. Their involvement in the care of intracerebral hemorrhage and subarachnoid hemorrhage in the emergency room, however, has not been described.</td>
<td>Jack Cochran, MD</td>
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<td>Amanda E Hughes</td>
<td>Biology</td>
<td>Mechanical Ventilation in the Setting of Acute Brain Injury and Acute Lung Injury</td>
<td>• Mechanical ventilation of patients with acute lung injury is complex, but aims at minimizing barotrauma by using low ventilation volumes. In patients with acute brain injury, low tidal volumes could result in hypercapnia, raising intracerebral blood volume and intracranial pressure. Thus, identifying tidal volumes that are simultaneously beneficial to the lungs and brain is desirable.</td>
<td>Laith Altaweel, MD</td>
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<td>Katherine Eberly</td>
<td>Biology, minor in Global Affairs</td>
<td>Boarding of Critically Patients in Non-specialized Intensive Care Units</td>
<td>• Studies suggest with acute brain injury may benefit from being admitted to the Neurosciences intensive care unit (NSICU). However, few studies have assessed the outcomes of non-neuro patients in the NSICU or of brain-injured patients treated in non-NSICU setting.</td>
<td>Laith Altaweel, MD</td>
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| Marcus Wilson   | Biology         | Small Aneurysm Rupture Rate                         | **OBJECTIVE:**  
• Comparison of the percentage of ruptured aneurysms at Inova Fairfax over the last 5 years and assess whether aneurysms less than 7 mm in size rupture at a rate higher than that quoted in the ISUIA trial. |
| Dewar Aziz      | Biology         | Intraprocedural rupture consequences                | **OBJECTIVE:**  
• A subarachnoid hemorrhage (SAH) is bleeding into the subarachnoid space, the area between the arachnoid membrane and pia mater surrounding the brain. This may occur spontaneously from a ruptured cerebral aneurysm.  
• Assessment of the neurological outcome and incidence of vasospasm after intraprocedural rupture compared with spontaneous subarachnoid hemorrhage. In other words, compare patients with aneurysms that bleed during the coiling procedures to patients with spontaneous SAH. |
| Abdul Halim     | Neuroscience     | MRI Utility for Basal Ganglia Hemorrhages           | **OBJECTIVE:**  
• Magnetic resonance imaging (MRI) is a medical imaging technique that provides contrast between different soft tissues of the body and thus, it is especially useful in imaging the brain.  
• Assessment of whether MRIs are useful or necessary for identifying underlying cause of basal ganglia hemorrhages and the rate of identification by MRI of an underlying lesion as a cause of spontaneous basal ganglia hemorrhage. |
| Emily Patrick   | Chemistry        | Anti-Weekend Effect: Lower Ischemic and Hemorrhagic Stroke Mortality in Patients Admitted on Weekends and Holidays | **OBJECTIVE:**  
• A recent report from Canada has suggested that hospital admission on weekends and holidays results in higher mortality for ischemic stroke, presumed to be a result of lack of staffing for diagnostic testing and therapeutic intervention.  
• Assessment of whether patients admitted on weekends and holidays result in higher mortality for ischemic stroke at Inova Fairfax Hospital |

Nilesh Vyas, MD

Jack Cochran, MD
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<td>Muhammed Shand</td>
<td>Chemistry</td>
<td>Stroke Outcome by Payor</td>
<td>• There is disparity in stroke care based on how patients pay for their medical care. Medicare patients are least likely to be discharged and patients without insurance may not be a surrogate for lower socioeconomic status.</td>
<td>Jack Cochran, MD</td>
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<td><strong>OBJECTIVE:</strong></td>
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<td>• Assessment of variability of outcome in ischemic stroke subarachnoid hemorrhage and intracerebral hemorrhage patients.</td>
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<tr>
<td>Sarah Albani</td>
<td>Neuroscience</td>
<td>Differences in LOS, Costs, In-Patient Mortality in Stroke Patients Before and After Introduction of a CNS Hospitalist Program</td>
<td>Review the length of stay, costs, in-patient mortality in stroke after Introduction of the CNS Hospitalist Program from Jan 1, 2011 to Dec. 31, 2011 and compare to the length of stay from Jan 1, 2010—Dec. 31, 2010. a. Could include a sub—analysis for comparing CNS hospitalist data to all physicians (community physicians + hospitalists) vs. Hospitalists only b. Method would be retrospective data analysis</td>
<td>Rena Bansal, MD</td>
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<tr>
<td>Nima Avin</td>
<td>Biology</td>
<td>Use of Expandable Biomechanical Cages as Treatment for Spinal Fractures</td>
<td>• There has been a recent increase in development and clinical use of various expandable biomechanical cages for vertebral body replacement. The advantage of using expandable cages is that they help correct and reconstruct a deformity from trauma or a pathological disease. <strong>OBJECTIVE:</strong> • Exploration and assessment the use of expandable biomechanical cages in lower cervical and upper thoracic regions in treatment of patients with pathological and traumatic fractures.</td>
<td>John Hamilton, MD</td>
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<td>Sarah Alsomairy</td>
<td>Neuroscience</td>
<td>Stroke in pregnant and postpartum women</td>
<td>• Ischemic infarcts and hemorrhages are uncommon but dangerous complications of pregnancy. The majority of strokes are seen in the third trimester and postpartum and are etiologically related to three conditions: reversible cerebral vasoconstriction syndrome, preeclampsia/eclampsia and cerebral venous thrombosis. The first two conditions are etiologically connected and can lead to ischemic and hemorrhagic events, whereas cerebral sinus thrombosis is mainly related to hypercoagulation and causes venous infarcts and brain hemorrhages. <strong>OBJECTIVE:</strong> • The objective of this study is to explore pregnant patients of Inova Fairfax Hospital that have experienced a stroke and report on their demographics, treatments, and outcome.</td>
<td>Jack Cochran, MD</td>
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  a. Could include a sub—analysis for comparing CNS hospitalist data to all physicians (community physicians + hospitalists) vs. Hospitalists only  
  b. Method would be retrospective data analysis | Rena Bansal, MD |
| Yousef Fazel        | Biochemistry | The Eastchester clapping sign (ECS). This novel test checks for the presence or absence of left hemi-inattention in patients with left hemiparesis. Neurology 2009; 66:114  
Based on a small sample, it appears that subcortical stroke patients with left hemiparesis are aware of their deficit and do not manifest the ECS  
**HYPOTHESIS:**  
  The ECS can accurately predict subcortical vs. cortical stroke (present only in cortical stroke)  
**METHODS:** compile data on 50 consecutive patients for the presence or absence and the degree of the presence of the clapping sign. | Jack Cochran, MD |
| Faris Siso          | Biology     | CNS Biomarker Development: Protein Changes in CSF and Serum after Traumatic Brain Injury. |  
* The central hypothesis is that inflammatory response, neuroprotective, and other protein factors play a role in both detrimental and neuroprotective effects in the brain following injury. These molecular responses can be used to identify marker proteins of diagnostic and prognostic value.  
* The purpose of this project is to perform proteomics studies that will be used to direct future research studies focusing on new therapeutic targets and discovering other potentially diagnostic and prognostic molecular signatures. | Robert Lipsky, PhD |
<p>| Salman Chaudry | Biology | Role of renin-angiotensin/angiotensin II receptor gene variation in susceptibility to cerebral artery aneurysms and development of vasospasm. | The renin-angiotensin system (RAS), composed of two major enzymes (renin and angiotensin-converting enzyme) and their substrates (angiotensinogen and angiotensin-I), plays a key role in the maintenance of a healthy vasculature. The main effector of this system is angiotensin II. Abnormalities of the RAS may lead to hypertension and atherosclerosis. Although the role of RAS in the pathogenesis of abdominal aortic aneurysms is established, the data on this system’s influence on formation of cerebral aneurysms and potential implication in the development of cerebral vasospasm after subarachnoid hemorrhage (SAH) are scant and rather controversial. In the USA, the prevalence of cerebral aneurysms ranges from 5% to 10% and the incidence of ruptured cerebral aneurysms is about 12 per 100,000 individuals. The latter may be associated with a mortality rate as high as 60%. Increased morbidity and mortality of SAH is associated with higher Hunt and Hess and Fisher CT (computer tomography) grades, advanced age, larger aneurysms, and presence of cerebral vasospasm. Hence, appropriate preventive measures should be taken in order to decrease the formation, progression, and rupture of cerebral aneurysms and prevention of cerebral vasospasm after SAH. Selection and institution of such preventive measures requires thorough knowledge of the potential pathogenic factors. For example, in the case of the RAS, the possible effects of enhanced or diminished activity (associated with certain genetic polymorphisms) on the cerebral aneurysm and development of vasospasm can be modulated by specific antagonists and agonists. In this project, a group of patients with ruptured cerebral aneurysms will be compared to a control group of individuals who have had computer tomography angiography of their head, obtained for any reason, which showed no evidence of cerebral aneurysm. Additionally, patients that develop cerebral vasospasm after SAH will be compared to patients with SAH and no evidence for vasospasm who will serve as controls. Eventually, in a second stage of this study, also patients with unruptured cerebral aneurysms will be investigated. The patients’ and controls’ DNA (extracted from blood samples) will be analyzed for the common genetic polymorphisms (or variations) of angiotensinogen, angiotensin- converting enzyme, and angiotensin II receptors. These genetic variants are associated with either an enhanced or diminished RAS activity. Subsequently, the possible effects of different variants and their interaction on the formation of aneurysms, their rupture, and on development of cerebral vasospasm will be evaluated. | Robert Lipsky, PhD |</p>
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<td>Yousef Fazel</td>
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<td>The Eastchester Clapping Sign (ECS)</td>
<td>• This novel test checks for the presence or absence of left hemi-inattention in patients with left hemiparesis. Neurology 2009; 66:114 Based on a small sample, it appears that subcortical stroke patients with left hemiparesis are aware of their deficit and do not manifest the ECS.</td>
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|                |             |                                                                  | **HYPOTHESIS:**  
• The ECS can accurately predict subcortical vs. cortical stroke (present only in cortical stroke)  
**METHODS:**  
• Compile data on 50 consecutive patients for the presence or absence and the degree of the presence of the clapping sign. | Jack Cochran MD               |
| Liza Hashim    | BS Neuroscience | Review of Anticonvulsants in the Neuroscience ICU | • This project would involve retrospectively and prospectively gathering data on the use of anticonvulsants in the NSICU.  
**Opinion and Drug Metabolism and Toxicity, June 5, 2009, (6) 955 to 701, Neurology, 2010 May, volume 16 (3) 165 to 175.**  
**HYPOTHESIS:**  
• There is variability in use of AEDs in the NSICU  
• Outcome can be improved by reducing variability in AED use  
• Cost can be reduced by reducing variability in AED use  
**METHODS:**  
• Tabulate the following via retrospective chart review. Will need to see if the data can be culled from one of IFHs information systems.  
• Diagnosis/indication, presence or absence of clinic seizures, abnormality of EEG, adverse effects related to anticonvulsant use, disposition at discharge as well as cost of AEDs use. | Laith Altaweel MD |
| Sahar Khan     | BA Psychology | Outcome of Patients Given TPA Without MRI Diffusion Evidence of Stroke (Averted Strokes). | • Review how many strokes over the last five years have been treated at Inova Fairfax Hospital with TPA who were subsequently found to have no abnormality of their MRI - no diffusion abnormality - suggestive of an acute stroke. American Academy of Neurology, Journal of Neurology, Volume 74 on April 27, 2010. University of Texas, Houston of 512 treated patients, 23% were found not to have an infract on the follow-up MRI imaging. The article discusses the stroke mimics, outcome, demographics of the various groups.  
**HYPOTHESIS:**  
• It is safe to give TPA to patients who have not had an acute stroke.  
• Some treated patients have stroke mimics, that is with patients that appeared to be having a stroke who have another often less serious neurologic problem. Among these other problems could be seizure, complicated migraine, or conversion disorder.  
**METHODS:**  
• Review retrospectively (and prospectively) all TPA patients treated to see how many have normal diffusion with MRI scans.  
• In addition to categorizing the patients as to whether or not they had an averted stroke, we should also tabulate various demographic data including age, gender, race, NIH stroke scale on admission, presence of involving risk factors, hyperlipidemia, hypertension, diabetes, atrial fibrillation, coronary artery disease, alcohol and drug abuse, and chronic tobacco use, last time normal prior to onset of treating with TPA, related symptomatic hemorrhage, rate of angioedema, modified Rankin score at discharge, length of hospitalization, and disposition at discharge. | Jack Cochran MD |
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<td>Joseph Patterson</td>
<td>Graduate Certificate (program in advanced medical science)</td>
<td>SDF-1/CXCR4 Signaling and Cell Cycle Regulation in Neuroblastoma and SDF-1-mediated downregulation of NR2B Subunit in Glioma cells</td>
<td>CXCR4, the receptor for the chemokine stromal-derived factor 1 (SDF-1), has been shown to mediate many of the processes essential for cancer progression such as tumor cell proliferation, metastasis, and angiogenesis. The goal of the project is to understand the role of CXCR4 in the biology of neuroblastoma and to identify characteristics that correlate with tumor cell phenotype.</td>
<td>Alex Carlisle PhD</td>
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<td>Sameer Yousuf</td>
<td>BS Neuroscience (graduated May 2011)</td>
<td>Functional Characterization of Genetic Variants Associated with Altered Memory Functioning in Older Adults and CNS Biomarker Development: Protein Changes in CSF and Serum after Traumatic Brain Injury</td>
<td><strong>Project 1:</strong> The goal of this project is to discover and functionally characterize genetic variants that are predicted to control gene expression and may play a role in memory in the aging human brain. Among those naturally occurring DNA sequence variants are single nucleotide polymorphisms or SNPs. We recently discovered a SNP of the human GRIN2B glutamate receptor gene that is associated with altered memory functioning in older adults and may represent a biomarker for mild cognitive impairment (MCI). We seek to further understand the molecular function of this SNP and other genetic variants at the biochemical and cellular level in order to establish a function guided approach for interpreting future genetic findings. <strong>Project 2:</strong> The purpose of this project is to perform proteomics studies that will be used to direct future research studies focusing on new therapeutic targets and discovering other potentially diagnostic and prognostic molecular signatures. The central hypothesis is that inflammatory response, neuroprotective, and other protein factors play a role in both detrimental and neuroprotective effects in the brain following injury. These molecular responses can be used to identify marker proteins of diagnostic and prognostic value.</td>
<td>Robert Lipsky PhD</td>
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<td>Zara Zahid</td>
<td>BS Biology</td>
<td>Transesophageal Echocardiogram (TEE) versus Transcranial Doppler (TCD)</td>
<td>This would explore the utility of using TCDS rather than TEEs in patients that are young who have cryptogenic stroke and analysis can be done to see whether the cost of providing a TCD is better than that for TEE and whether there is any difference in outcome. Stroke, July 2009, author Romero, page 2343. Stroke 2010; 41:E195. <strong>HYPOTHESIS:</strong> • TCD is as accurate as TEE in determining the presence of a right to left shunt indicating possible PFO in patients with cryptogenic stroke • It is less expensive <strong>METHODS:</strong> • From data bases or chart review compile data on all inpatients undergoing TCD with bubble study and TEE in patients with cryptogenic stroke • The diagnosis of the patient’s demographic such as age, gender, cardiovascular risk factors, and imaging results would be compiled • In patients who have both tests done, it will be possible to correlate the agreement between the two tests as to the presence or absence of right to left shunting.</td>
<td>Laith Altaweel MD</td>
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| Elizabeth Benkert | BS Neuroscience | Interventional Neuroradiology (INR) Treatment Outcome—the Last 100 Patients | • Over the last five years - reviewed last 100 patients for five-years worth of patients treated with interventional neuroradiologic procedures including Merci device and Penumbra and intra-arterial lytics. The reason to do this is to see whether our outcomes justify the effort involved to see whether there are any demographic features that would lead one to believe that certain patients should not be transported to such interventional treatment.  

**HYPOTHESIS:**  
• Some patients undergoing INR treatment do better than others  
• Differences in outcome can help formulate an algorithm of whom to transport and treat  

**METHODS:**  
• Compile data on:  
  o stroke type  
  o vessel occluded  
  o presenting NIHSS  
  o outcome of revascularization attempt (successful revascularization or not),  
  o age  
  o gender,  
  o prior stroke  
  o time from stroke onset to treatment  
  o treated with IV TPA before INR treatment or not  
  o complications of INR treatment  
  o outcome mRS at discharge | Jack Cochran MD |
| Etsehiwot Albert | BS Biology | Comparison of Outcomes in Neurosciences Patients Admitted Before and After Implementation of a CNS Hospitalist Program in a Large Non-Academic Community Hospital | Review the length of stay, costs, in-patient mortality rate, 30 day re-admission rates for the CNS Hospitalists from Jan 1, 2011 to Dec. 31, 2011 and compare to the length of stay and re-admission rate from Jan 1, 2010-Dec. 31, 2010.  
  a. Could include a sub-analysis for comparing CNS hospitalist data to all physicians (community physicians + hospitalists) vs. Hospitalists only  
  b. Method would be retrospective data analysis  

Previous study by Auerbach et. al demonstrated a reduction in hospital cost and improvement in health care professionals’ perception of care quality (Auerbach, et. al, Comanagement of Surgical Patients Between Neurosurgeons and Hospitalists, Arch Intern Med., Vol 170, No.22 Dec 13/27, 2010) | Rena Bansal, MD |
<p>| Anthony Trenga | Undeclared Major | Care of Neurosurgical Patients in Theater: Review of 100 Cases from Operation Iraqi Freedom. | This project will entail the review of 100 or so operative cases of Col. Ecklund (ret) from Operation Iraqi Freedom with respect to patient characteristics, injury details (including review of imaging studies), operative treatment undertaken, and outcomes. | James Ecklund MD |</p>
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| Atit Patel       | BS Biology               | Use of Hemicraniectomy in Malignant Middle Cerebral Artery (MCA) Stroke       | Hemicraniectomy can save the life of patients with malignant MCA syndrome. There is controversy on when and if to do the procedure. Stroke 2007; 38:240-24112, Stephan A. Mayer; Advances in Critical Care and Emergency Medicine, 2007, Stephan A. Mayer In Stroke, February 1, 2008 39 (2): 261-263. HYPOTHESIS:  
  • At IFH there has been great variability in use of hemicraniectomy in malignant MCA syndrome  
  • Review of the last 5 years’ cases can result in a consensus and protocol to treat malignant MCA in the future is to check whether or not this has any effect on outcome. Other things to measure are variability and its use, indications, timing, monitoring risk factors, demographics, and outcome. The reference The hope would be to develop protocol for indication for hemicraniectomy as well as prospectively follow the outcome in such patients. METHODS:  
  • Retrospectively review last 5 years’ data on patients undergoing hemicraniectomy for malignant MCA stroke at IFH.  
  • Chart review or from IFH databases  
  • Compile data on:  
    o Initial NIHSS  
    o Demographics such as age, gender, prior stroke, risk factors, race, insurance status  
    o NIHSS before surgery  
    o Timing of surgery relative to admission and any clinical change preceding decision  
    o Time from consideration of hemicraniectomy and surgery itself  
    o mRS at discharge and 1 year | James Ecklund MD |
| Benjamin Collins | Graduate Certificate (program in advanced medical science) | A Prospective Review of the Use of Video EEG (vEEG) in the Neuroscience ICU | vEEG is employed in our NSICU. It is unclear that any protocol or convention is followed. Outcome and treatment may be modified by vEEG data. Anesthesia and Analgesia, 2009 August; 109 (2):506-523. Journal of Clinical Neurophysiology, 2004, September to October; 21 (5): 332-340. HYPOTHESIS:  
  • There is great variability in the utilization of vEEG in the NSICU  
  • Use of an algorithm will improve consistency and enable us to follow outcome and discern the utility of vEEG  
  • Changes in AED use and dosing will occur METHODS:  
  • All patients having vEEG monitoring will have the following data compiled (either from chart review or one of IFHs data bases):  
    o diagnosis  
    o indication for vEEG  
    o results of vEEG  
    o AED use  
    o change in treatment plan based on vEEG results  
    § AED changed, dose changed  
    § end of life options re-evaluated | Laith Altaweel MD |