ASN Mission Statement

The American Society of Neuroimaging (ASN) is an international, professional organization representing neurologists, neurosurgeons, neuroradiologists, and other neuroscientists who are dedicated to the advancement of any technique used to image the nervous system. The ASN supports the right of qualified physicians to utilize neuroimaging modalities for the evaluation and management of their patients, and the rights of patients with neurological disorders to have access to appropriate neuroimaging modalities and to physicians qualified in their use and interpretation.

The goal of the ASN is to promote the highest standards of neuroimaging in clinical practice, thereby improving the quality of medical care for patients with diseases of the nervous system. This goal is accomplished through:
• Presenting scientific and educational programs at an annual meeting and through the promotion of fellowships, preceptorships, tutorials and seminars related to neuroimaging;
• Publishing a scientific journal;
• Formulating and promoting high standards of practice and setting training guidelines;
• Evaluation of physician competency through examinations.

Emphasis is placed on the correlation between clinical information and neuroimaging data to provide the cost effective and efficient use of imaging modalities for the diagnosis and evaluation of diseases of the nervous system.

The ASN will continue to develop training and practice guidelines related to neuroimaging for: 1) physicians in practice who currently use neuroimaging; 2) physicians in residency or fellowship training; 3) physicians in practice who wish to use neuroimaging; and 4) healthcare entities responsible for defining or allocating professional privileges and credentialing to individual physicians.
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## PROGRAM AT A GLANCE

### THURSDAY

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<td>MRI Hands-On Workshop</td>
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<tr>
<td>9:00 am – 1:00 pm</td>
<td>Current Topics in MR Imaging (Part II continued)</td>
<td>Salons A-E</td>
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<tr>
<td>9:00 am – 1:00 pm</td>
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<td>Watson Island Room</td>
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9:30 am – 3:30 pm  Neurosonology Examination (offsite)
EVENTS

Thursday, January 26, 2012
Welcome Reception
6:00 pm - 7:00 pm
Salons F-K
Please join us for the Welcome and Poster Stand-By Reception. The Reception is complimentary for all registered attendees; guests are welcome with a $50.00 registration fee. Please visit the Registration Desk to register your guest prior to the reception.

Saturday, January 28, 2012
Presidential Address & Awards Luncheon
1:15 pm - 2:45 pm
Salons A-E
Please join us for the annual Presidential Address and Awards Luncheon, complimentary to all registered attendees. Important issues in the field of neuroimaging and ASN's position in creating change will be addressed. The Luncheon will also include a presentation of the 2012 awards.

Saturday, January 28, 2012
Saturday Night Social Event at MEKKA
7:30 pm - 10:30 pm
950 NE 2nd Ave, Miami, FL 33132 – Shuttle transportation will be provided.
Kick off your Saturday night with your colleagues on the dance floor at Mekka, one of Miami's premiire night clubs in the downtown district. The night will begin with drinks and hors d'oevres as well as a latin dance act. Later in the evening we will spice things up with an entertaining drag show performance (rated PG).
Tickets are $75 and can be purchased online or onsite. We hope you will join us!
Please note: Mekka is an adults only venue.
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La Quinta, CA

Mircea Morariu, MD  
Florida Neurologic Center  
Delray Beach, FL

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Minneapolis, Minnesota

Alexander Razumovsky, PhD, FAHA  
Sentient Medical Systems, Inc.  
Cockeysville, Maryland

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University of Miami School of Medicine  
Miami, Florida

Tatjana Rundek, MD, PhD  
University of Miami  
Miami, Florida

Qaisar Shah, MD  
Abington Memorial Hospital  
Abington, PA

Gabriella Szatmary, MD, PhD  
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Hattiesburg, Mississippi

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Buffalo, NY

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Kalamazoo Nerve Center  
Kalamazoo, Michigan

Robert Zivadinov, MD  
Jacob's Neurologic Institute  
Buffalo, NY
Advances in Diagnosis and Management of Cerebral and Spinal Venous Disorders
7:00 - 9:00 pm ● Salons A-E ● CME: 2 Hours
Director: Adnan Qureshi, MD
Faculty: Adnan Qureshi, MD, Rakesh Khatri, MD and Qaisar Shah, MD

In the present decade, progress has been made in our understanding of cerebral venous sinus thrombosis (CVST) from individual studies and from the International Study on Cerebral Vein and Dural Sinus Thrombosis (ISCVT). The ISCVT is the largest multinational observational study to date on CVST. The study included 624 adult patients with symptomatic CVST who were diagnosed at 89 participating centers in 21 countries. The American Stroke Association released a new professional statement on diagnosis and management of CVST in 2010 based on all the recent advances in the field. Our understanding of collateral supply and recanalization suggests that the venous system is more dynamic than previously understood. New role of venous outflow resistance in multiple sclerosis and idiopathic intracranial hypertension has led to revascularization as a therapeutic approach in these diseases. Spinal vascular malformations including arteriovenous fistulas (AVFs) and arteriovenous malformations (AVMs) cause myelopathies due to venous congestion (Foix-Alajouanine syndrome). Due to potential endovascular therapies, a better understanding and timely diagnosis can be highly beneficial for patients with such syndromes. Congenital venous abnormalities such as vein of Galen aneurysms are an important cause of heart failure, hydrocephalus, and neurological impairment in neonates.

7:00 pm – 7:05 pm    Introduction
7:05 pm - 7:30 pm    Update on management of cerebral venous sinus thrombosis and chronic venous outflow obstruction in the Endovascular Era  
                     Adnan Qureshi, MD
7:30 pm – 7:55 pm    Spinal venous congestion and myelopathic syndromes - Foix-Alajouanine syndrome reconsidered  
                     Qaisar Shah, MD
7:55 pm – 8:20 pm    Pediatric diseases: Vein of Galen aneurysms and beyond  
                     Rakesh Khatri, MD
8:20 pm – 9:00 pm    Case Discussions  
                     Faculty

On the completion of this activity, participants will be able to:

1) Describe natural history and management strategies for acute and chronic cerebral and spinal venous diseases and their effectiveness.
2) Review recent developments in diagnostic modalities for acute and chronic acute and chronic cerebral and spinal venous diseases.
3) Review recent developments in endovascular treatments of acute and chronic acute and chronic cerebral and spinal venous diseases.
Friday, January 27, 2012

Breakfast Seminar: Perfusion Imaging
7:00 – 8:30 am ● Salons A-E ● CME: 1.5 Hours
Director: David Liebeskind, MD
Faculty: David Liebeskind, MD and Tudor Jovin, MD

This seminar will introduce and explore the vast potential of perfusion imaging methods in current and future clinical practice scenarios ranging from stroke to neuro-oncology. The basic concepts of various perfusion modalities, including CT, MRI and angiography, will be described. The technical aspects and mathematics will be presented from the clinical perspective, exploring how these tools can be used to detail microvascular changes in the blood-brain barrier and complex hemodynamics. Practical applications in acute stroke and chronic neurovascular disorders will be outlined. The course is designed for all neuroimaging enthusiasts that encounter blood flow alterations in clinical practice.

7:00 am – 7:35 am Principles and Potential of Perfusion Imaging: Realizing Cerebral Blood Flow from Hemodynamics to Permeability
David S Liebeskind, MD

7:35 am – 7:45 am Discussion

7:45 am – 8:20 am Use of CT and MRI Perfusion from Acute to Chronic Ischemia
Tudor Jovin, MD

8:20 am – 8:30 am Discussion

Upon completion of this seminar, attendees will have a firm understanding of:

1) Basic concepts involved in imaging blood flow in the brain
2) Current and evolving perfusion imaging modalities
3) How the mathematics of perfusion imaging translate into specific hemodynamic measures
4) Applications from acute stroke to prevention of hemodynamic compromise

The course is intended for those individuals interested in first learning about perfusion imaging to those focused on specific aspects that impact clinical practice. Discussion of innovative approaches to perfusion imaging will underscore the mounting enthusiasm for these neuroimaging modalities.

This course is designed to procure the following desirable physician attributes: Enthusiasm to expand knowledge; interest in advancing care of the stroke patient; improve problem-solving, practice-based learning and patient care.

Breakfast Seminar: Applied Principles of Ultrasound Physics and Fluid Dynamics
7:00 – 8:30 am ● Watson Island Room ● CME: 1.5 Hours
Director and Faculty: Andrei Alexandrov, MD, RVT

This seminar is being offered to review ultrasound physics and fluid dynamics, demonstrate typical imaging artifacts and waveforms that interpreting physicians and sonographers need to identify and correct and to interact with the audience and answer questions about these typical findings. Course faculty will discuss applied principles of ultrasound physics and fluid dynamics using a set of approximately 50 typical images/waveforms. Discussion format includes brief case/symptom presentation and an ultrasound image. Faculty will ask the audience to interpret the image, and engage in discussion of differential diagnosis and common pitfalls that are linked to ultrasound physics and fluid dynamics.

Upon completion of this activity, participants will be able to:

1) Review most common ultrasound imaging artifacts and spectral waveforms.
2) Learn key principles of applied ultrasound physics and fluid dynamics that are responsible for these findings.
3) Learn how to differentiate, optimize and interpret typical ultrasound imaging artifacts and spectral waveforms.
This course is designed to procure the following desirable physician attributes:

1) Understand the MR imaging findings in intracranial hemorrhage.
2) Understand the MR imaging findings in various congenital anomalies of the CNS.
3) Understand the MR imaging findings of ischemic stroke.
4) Understand the MR imaging of demyelinating diseases.
5) Understand the typical MR imaging of CNS infections.
6) Understand the MR imaging of Epilepsy.
7) Understand the imaging of the Basal Ganglia in various disease states.
8) Understand the imaging appearance of various intracranial neoplasms.
9) Understand the MR imaging findings in vascular anomalies.
10) Review interesting neuroimaging findings in case study format.

This course is designed to procure the following desirable physician attributes: Work in interdisciplinary teams, Apply quality improvement, Practice-based learning and Interpersonal and communication skills.
This course is for individuals interested in performing and interpreting Neurosonology (carotid and transcranial Doppler (TCD) ultrasound) studies. The faculty will discuss carotid and TCD ultrasound physics and technique, interpretation and clinical application of both techniques. Ample time will be left for questions and discussion. Upon completion of this course, participants will be able to identify the physics, technique, interpretation and clinical applications of carotid and TCD ultrasound. The course material is designed for participants seeking basic knowledge of Neurosonology.

9:00 am – 10:00 am Carotid Ultrasound Physics and Technique Charles Tegeler, MD
10:00 am – 11:00 am Carotid Ultrasound Interpretations and Clinical Applications Charles Tegeler, MD
11:00 am – 12:00 pm TCD Ultrasound Physics and Technique Andrei Alexandrov, MD, RVT

**Current Topics in Neurosonology (Part I and II)**

This course is for individuals interested in performing and interpreting advanced carotid duplex studies for assessment of carotid intima-media thickness, carotid atherosclerosis and risk evaluation for cerebrovascular disease. Transcranial doppler (tcd) ultrasound studies for specific applications, like for patients after ischemic stroke and cryptogenic stroke, role of sonothrombolysis, application and interpretation of TCD for patients after SAH due to the aneurysm rupture or due to the traumatic brain injury will be discussed. Ample time will be left for questions and discussion. Upon completion of this course, participants will be able to identify interpretation and clinical applications of abovementioned specific neurosonology applications. The course material is designed for participants seeking advanced knowledge of neurosonology and its clinical applications.

12:00 pm – 1:00 pm TCD Interpretations and Clinical Applications Alexander Razumovsky, PhD, FAHA
1:00 pm – 2:00 pm Lunch Salons F-K
2:00 pm – 3:00 pm Carotid Duplex Studies Interpretation Charles Tegeler, MD
3:00 pm – 4:00 pm TCD Studies Interpretation for Patients with Acute Stroke Andrei Alexandrov, MD, RVT
4:00 pm – 5:00 pm TCD Studies Interpretation for Patients with SAH Alexander Razumovsky, PhD, FAHA
5:00 pm – 6:00 pm TCD studies interpretation based on cases monitored in OR (CEA, carotid stenting, cardiac surgeries) Zsolt Garami, MD

**Upon completion of the course, physicians will:**
1) Identify proper techniques and protocols for performing advanced TCD studies
2) Relate normal and abnormal blood flow patterns to clinical presentation
3) Understand clinical usefulness and limitations of the advanced TCD ultrasound evaluations and learn how to write preliminary and final reports

**This course is designed to procure the following desirable physician attributes:** Patient-centered care, Quality Improvement and Evidence based practice
The CyberKnife® Robotic Radiosurgery System was cleared by the U.S. Food and Drug Administration in 1999 to treat tumors in the head and base of the skull. CyberKnife System delivers high doses of radiation directly to brain tumors. The CyberKnife System also can treat benign, or non-cancerous, tumors and other conditions, such as trigeminal neuralgia and arterial venous malformations (AVMs). Usually the team consists of Radiation Oncologists, Neurosurgeon, Medical Physicist, Radiation therapist. Neurologists have historically not been involved with cyber knife surgery. As the field of cyber knife evolves, neurologists need to take an active interest. There is dearth of knowledge in Cyberknife applications among neurologists. There could be tremendous potential for neurologists in this field if we take active role.

**Cyberknife: Introduction to Neurologists**

**1:00 - 2:00 pm • Salons A-E • CME: 1 Hour**

Director and Faculty: Rakesh Khatri, MD

Course Objectives:
1) Provide an overview of Cyberknife and emphasise on the indications of Cyberknife in general for brain and spine including AVMs.
2) Learn how neurologists can get trained in Cyber knife.
3) learn how interventional neurologists can take advantage of cyber knife to make AVM treatment centers.

This course is designed to procure the following desirable physician attributes: Enhance medical knowledge and improve patient care

### MRI Hands-On Workshop

**7:00 – 10:00 pm • Bayview Ballroom • CME: 3 Hours**

Director: Geoffrey Hartwig, MD

Faculty: John Bertelson, MD, Jennifer McVige, MD, Bhagwan Moorjani, MD, Gabriella Szatmary, MD, PhD and Eugene Wang, MD

Workshop participants will rotate among reading stations supervised by the course faculty. After a brief review of the expert's approach to interpreting brain and spine MRI studies, the students will read a selection of scans brought in by the faculty. Course participants will be expected to present mock dictations of the MRI studies and will be critiqued by their peers and professors. Controversial cases will be discussed among the entire group of participating faculty and students. This workshop is designed for participants with some practical experience in interpreting brain and spine MRI scans. Those with less experience may wish to participate, although they may find the workshop to be exceptionally challenging.

Upon completion of the workshop attendees will:
1) Have been exposed to a representative cross-section of neurological MRI studies encountered by MRI neuro imagers in a typical work environment;
2) Have observed the experienced MRI expert’s approach to scan interpretation;
3) Have acquired personal experience interpreting neurological MRI studies; and
4) Have been supervised and directed in improving their reading skills at their own workplaces.

This course is designed to procure the following desirable physician attributes: Medical knowledge.

### Neurosonology Hands-On Workshop

**7:00 – 10:00 pm • Salons F-K • CME: 3 Hours**

Director: Andrei Alexandrov, MD, RVT

Faculty: Andrei Alexandrov, MD, RVT, Eva Bartels, MD, Zsolt Garami, MD, Alexander Razumovsky, PhD, FAHA, Charles Tegeler, MD and Tatjana Rundek, MD, PhD

This workshop will provide structured hands-on and question and answer sessions in carotid/vertebral duplex and specific transcranial Doppler techniques complete testing, emboli detection, right-to-left shunt detection and assessment of vasomotor reactivity. Both the beginner and experienced users are encouraged to attend. The workshop will also provide an opportunity to try the latest equipment, to meet experts and to discuss various aspects of neurosonology in small groups. The workshop is designed to meet the need for basic and advanced knowledge of insonation techniques, technological advances, and practical aspects of cerebrovascular testing.

Upon completion of the workshop attendees will:
1) Review complete scanning protocols for diagnostic carotid/vertebral duplex and TCD examinations, vasomotor reactivity, emboli detection, right-to-left shunt testing, and monitoring procedures (thrombolysis, head-turning, peri-operative testing), and IMT measurements.
2) Review equipment and expertise requirements in performing selected tasks with faculty using hands-on, instructional video or real time case recordings.
### Breakfast Seminar: White Matter Disease on MRI: Cases, Pearls, and Differential Diagnosis

**7:00 - 8:30 am • Salons A-E • CME: 1.5 Hours**

**Director:** Robert Bermel, MD  
**Faculty:** Robert Bermel, MD and Robert Fox, MD

This course will be a two-hour case-based discussion of diseases which affect the cerebral white matter and the differentiation of these conditions based on their imaging features. An overview of this differential diagnosis will be initially discussed as an introduction. Multiple sclerosis will be discussed as the prototype of white matter disease, with substantial content devoted to other diseases which may mimic the appearance of demyelinating disease. Pertinent “red flags” will be discussed that should raise suspicion for diagnoses other than MS. Diseases with potentially similar imaging appearances will be presented side-by-side and differentiating characteristics will be highlighted. Other classes of disease presented will include metabolic disease/leukodystrophies, rheumatologic and infectious diseases, as well as vascular disease and migraine.

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<th>Time</th>
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<th>Instructor(s)</th>
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<tr>
<td>7:00 am - 7:40 am</td>
<td>Overview, Cases and Differential Diagnosis</td>
<td>Robert Bermel, MD</td>
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<td>7:40 am - 8:20 am</td>
<td>Cases and Differential Diagnosis 2</td>
<td>Robert Fox, MD</td>
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<tr>
<td>8:20 am - 8:30 am</td>
<td>Questions and Answers</td>
<td>Faculty</td>
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**Course Objectives:**
1) Understand the differential diagnosis of cerebral white matter lesions on imaging  
2) Discuss imaging features which aid in the differentiation of these diseases  
3) Recognize the most common mimics of multiple sclerosis on MRI, and "red flags" that suggest them.

**This course is designed to procure the following desirable physician attributes:** Patient-centered care and cognitive expertise.

### Breakfast Seminar: Cerebral Venous System Evaluation by Transcranial Color Coded Duplex and Magnetic Resonance Venography

**7:00 – 8:30 am • Watson Island Room • CME: 1.5 Hours**

**Director:** Zsolt Garami, MD  
**Faculty:** Zsolt Garami, MD and Laszlo Mechtler, MD

TCCD has advantages over TCD by showing the images of the intracranial anatomy and arteries by duplex B-mode, while still measuring velocities with Doppler. Cerebral venous sinus thrombosis represents clot formation in the superficial and deep venous sinus with or without extension into the cortical veins. The superior sagittal sinus, transverse sinus and vein of Galen are usually involved. MRV provides great tools to evaluate these segments. We will showcase fusion imaging of TCCD and MRI imaging in the clinical practice.

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<tr>
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<td>Transcranial Color Coded Duplex</td>
<td>Zsolt Garami, MD</td>
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<td>7:35 am – 7:45 am</td>
<td>Questions and Answers</td>
<td>Faculty</td>
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<td>7:45 am – 8:20 am</td>
<td>Magnetic Resonance Venography</td>
<td>Laszlo Mechtler, MD</td>
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<tr>
<td>8:20 am – 8:30 am</td>
<td>Questions and Answers</td>
<td>Faculty</td>
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**Course Objectives:**
1) TCCD and MRV is a commonly used method in Europe and may be underutilized in the United States. This combined imaging seminar will explore the advantages and disadvantages for each imaging modality.  
2) Learn more about the cerebral venous system and provide an objective review of the protocols and interesting cases.  
3) Conference participants will find tips for imaging correlation between imaging modalities for everyday clinical utility useful.

**This course is designed to procure the following desirable physician attributes:** Patient Care, Medical Knowledge and Practice-based Learning and Improvement
Evidence based practice

This course is designed to procure the following desirable physician attributes:
1) Identify proper techniques and protocols for performing advanced TCD studies
2) Understand clinical usefulness and limitations of the advanced TCD ultrasound evaluations and studies.
3) Understand the MR imaging principles and specific imaging findings in degenerative disease of the spine.
4) Review specific MR imaging findings in case-study format.

Upon completion of the course, physicians will:
1) Understand the basic principles of MR Physics.
2) Understand the MR imaging principles and specific imaging findings in degenerative disease of the spine.
3) Understand MR imaging typical of various Headache syndromes.
4) Review specific MR imaging findings in case-study format.

This course is designed to procure the following desirable physician attributes: Work in interdisciplinary teams, Apply quality improvement, Practice-based learning and Interpersonal and communication skills.

Current Topics in Neurosonology Part II continued
9:00 am - 1:00 pm ● Watson Island Room ● CME: 3.75 Hours
Director: Alexander Razumovsky, PhD, FAHA
Faculty: Andrei Alexandrov, MD, RVT, Eva Bartels, MD, Alexander Razumovsky, PhD, FAHA, Tatjana Rundek, MD, PhD and Charles Tegeler, MD

Upon completion of the course, physicians will:
1) Identify proper techniques and protocols for performing advanced TCD studies
2) Relate normal and abnormal blood flow patterns to clinical presentation
3) Understand clinical usefulness and limitations of the advanced TCD ultrasound evaluations and learn how to write preliminary and final reports

This course is designed to procure the following desirable physician attributes: Patient-centered care, Quality Improvement and Evidence based practice.
Evidence based practice

This course is designed to procure the following desirable physician attributes:

1) Identify proper techniques and protocols for performing advanced TCD studies
2) Relate normal and abnormal blood flow patterns to clinical presentation
3) Understand clinical usefulness and limitations of the advanced TCD ultrasound evaluations

Upon completion of the course, physicians will:

1) Be able to develop a strategy in diagnosing various neurologic conditions using neuroimaging
2) Become familiar with neuroimaging tools that improve diagnostic precision
3) Become familiar with clinical applications of diverse neuroimaging modalities

This activity is intended for neurologists, physicians, psychiatrists, nurses, technicians and other healthcare professionals involved in the care of children and adults presenting acutely, sub-acutely or chronically with mental changes, ataxia, weakness, involuntary movements, migraine or seizures.

This course is designed to procure the following desirable physician attributes: Medical knowledge, leadership

Neuroimaging Self-Assessment Evaluation

3:00 - 4:30 pm ● Lummus Island Room ● CME: 1.5 Hours
Director: Eric Lindzen, MD, PhD
Faculty: Eric Lindzen, MD, PhD, Dara Jamieson, MD, and Patrick Capone, MD, PhD

The Neuroimaging Self-Assessment Examination (SAE) is intended to be a Neuroimaging self-assessment tool, providing participants a structured opportunity to gain insight into their own personal strengths and weaknesses relative to their peers in the provision and clinical evaluation of Neuroimaging studies. Knowledge and skills to be assessed in this setting will include identification of normal anatomical structures, accuracy in the identification of specific pathologies on MRI and CT studies, formulation of Neuroimaging differential diagnoses, basic MRI and CT physics knowledge, and the ability to correlate imaging findings with clinical history. Subject matter covered by the SAE will include diagnostic neuroimaging of common neurological disorders such as cerebrovascular disease, multiple sclerosis, CNS trauma, tumors and cysts, infections, toxic/metabolic disorders and diseases of the spinal cord and surrounding tissues. Knowledge of basic MRI and CT physics principles essential for protocol design, safety, recognition of artifact and differentiation of tissue types based upon CT density and MRI signal characteristics will also be assessed.

The target audience includes residents, fellows and attending physicians in the fields of neurology, neurosurgery and radiology who wish to address potential gaps between their own performance levels and commonly accepted standards of care in the provision of Neuroimaging interpretations.

The SAE will be presented in a multiple choice Powerpoint format projected on a screen to the audience with 1.5 minutes allotted per question. The subject matter will span 30 clinical Neuroimaging cases and 20 imaging physics and technology related questions. Each question will consist of a short text passage describing a clinical vignette or specific imaging related parameters, accompanied by images or diagrams, followed by six multiple choice answer options. Attendees will mark the single best answer to each question on a provided answer sheet, which will be passed in for grading at the end of the 90 minute course period. Clinical cases will incorporate detailed, high resolution MRI and CT images of the brain and spine (including MR and CT angiography).

Individual exam scores will be anonymous to all participants except for each individual examinee, who will have results provided in an emailed score report within 21 days of the exam. Anonymous scores will be statistically analyzed by the course directors for validation and exam improvement purposes. None of the material to be used in this self-assessment exercise shall have been previously copyrighted.

Continued on next page…
Upon completion of the course, attendees will:

1) Become more familiar with personal strengths and weaknesses in the identification of normal versus abnormal imaging findings.
2) Become more familiar with personal strengths and weaknesses in formulating a differential diagnosis pertaining to specific imaging presentations.
3) Achieve greater levels of confidence in acquiring and interpreting MRI and CT studies in common neurological disorders such as MS, stroke, tumor and trauma.
4) Be able to identify areas of future study to increase levels of competence in the interpretation of diagnostic Neuroimaging cases.
5) Be able to identify areas of future study to increase levels of competence in MRI and CT physics.

This course is self-assessment exercise and not a board review.

This course is designed to procure the following desirable physician attributes: Quality Improvement, Medical Knowledge, Cognitive Expertise, and Commitment to Lifelong Learning

Carotid Imaging Symposium: Stenting Versus Surgery Versus Medical Therapy
4:00 - 6:00 pm  Salons A-E  CME: 2 Hours
Director: Zsolt Garami, MD
Faculty: Zsolt Garami, MD, Dara Jamieson, MD, Alan Lumsden, MD and Adnan Qureshi, MD

Since 2004, when carotid artery stenting (CAS) was approved for clinical use in the US, it has become an acceptable alternative to carotid endarterectomy (CEA) in selected patients. More than 150,000 carotid interventions are performed each year. Management of carotid disease represents an ever increasing component of cerebrovascular care with important developments in the management and the introduction of new and brain saving technologies. After CREST results are determined timely decisions need to be made.

This symposium will provide provocative, up-to-date, evidence-based information coupled with cases of open and endovascular simulators so that the attendee can image and understand all imaging modalities and determine the appropriate therapy for their patients.

4:00 pm – 4:25 pm  Neurosonology  Zsolt Garami, MD
4:25 pm – 4:50 pm  Carotid Endarterectomy  Alan Lumsden, MD
4:50 pm – 5:15 pm  Carotid Artery Stenting  Adnan Qureshi, MD
5:15 pm – 5:40 pm  Medical Therapy  Dara Jamieson, MD
5:40 pm – 6:00 pm  Discussion  Faculty

Course Objectives:
1) Review: Stroke risk estimation, timing of intervention, patient selection,
2) Learn about: medical or surgical/interventional therapy – evidence based medicine after CREST results
3) Learn about: imaging for plaque characterization and post procedure imaging

This course is designed to procure the following desirable physician attributes: Patient Care, Medical Knowledge and Practice-based Learning and Improvement
Sunday, January 29, 2012

**Breakfast Seminar: Extracranial Vertebral Artery Disease**

7:00 - 8:30 am ● Salons A-E ● CME: 1.5 Hours

Director: Sebastian Koch, MD

Faculty: Sebastian Koch, MD and Jose Romano, MD

The course will review the role of extracranial vertebral disease in posterior circulation stroke. This will include a discussion of the prevalence of vertebral artery origin stenosis in symptomatic and non-stroke populations. Stroke mechanisms of vertebral artery origin stenosis will be reviewed. The course will examine the non-invasive diagnosis of proximal vertebral artery disease with a focus on ultrasonographic diagnosis and diagnostic criteria.

7:00 am – 7:05 am Welcome and Introduction Sebastian Koch, MD

7:05 am – 7:25 am Vertebral Artery Origin Stenosis and Stroke Sebastian Koch, MD

7:25 am – 7:45 am Diagnostic Techniques to Detect Vertebral Artery Origin Stenosis Jose Romano, MD

7:45 am – 8:05 am Ultrasonographic Diagnosis of Vertebral Origin Stenosis Sebastian Koch, MD

8:05 am – 8:20 am Case Studies of Vertebral Stenosis with Focus On Diagnosis and Management Faculty

8:20 am – 8:30 am Questions and Discussion Faculty

**Course Objectives:**
1) Discuss the role of extracranial vertebral disease in posterior circulation stroke.
2) Understand diagnostic modalities to identify extracranial proximal vertebral stenosis.
3) Describe the use of ultrasonography to identify extracranial proximal vertebral stenosis.

**This course is designed to procure the following desirable physician attributes:** Practice based learning and Increase knowledge base.

**Breakfast Seminar: Pediatric Neuroimaging**

7:00 - 8:30 am ● Watson Island Room ● CME: 1.5 Hours

Director: Bhagwan Moorjani, MD

Faculty: Bhagwan Moorjani, MD and Jennifer McVige, MD

The faculty will review common pediatric neuroimaging abnormalities such as, metabolic and degenerative disorders, developmental anomalies, neurocutaneous syndromes, abnormalities associated with epilepsy (migrational anomalies), and posterior fossa abnormalities. The course is intended for neurologist, neurology residents and fellows, neurosurgeons, radiologist and pediatricians.

7:00 am – 7:40 am Developmental, migrational, metabolic and degenerative disorders Bhagwan Moorjani, MD

7:40 am – 7:45 am Questions Faculty

7:45 am – 8:25 am Neurocutaneous and posterior fossa conditions Jennifer McVige, MD

8:25 am – 8:30 am Questions Faculty

**Upon completion of the course physicians will be able to:**
1) Identify developmental and migrational abnormalities.
2) Identify common neuroimaging findings associated with neurocutaneous syndromes.
3) Identify common findings associated with metabolic and degenerative disorders.
4) Understand the differences between common abnormalities seen in the posterior fossa in children.

**This course is designed to procure the following desirable physician attributes:** provide patient centered care, integrating multidisciplinary teams, provide practice based learning and improvement and improve medical knowledge.
Symposium: Neuroimaging of Cognitive and Behavioral Disorders
9:00 - 11:30 am ● Salons A-E ● CME: 2.5 Hours
Director: Joseph Masdeu, MD, PhD
Faculty: Joseph Masdeu, MD, PhD and Eduardo Gonzalez-Toledo, MD, PhD

This course will review the neuroimaging findings in psychiatric disorders and dementia and other cognitive disorders. In particular, the availability in the clinical setting of amyloid imaging will make an impact in the usefulness of neuroimaging in dementia prognosis in the short term and may help accelerate the discovery of new therapies. In this course, after two lectures, several cases will be discussed with the audience. This course is intended for neurologists, radiologists, fellows and residents interested in brain imaging.

9:00 am – 9:50 am    Neuroimaging of Psychiatric Disorders                          Eduardo Gonzalez-Toledo, MD, PhD
9:50 am – 10:40 am    Neuroimaging of Dementia                                         Joseph C. Masdeu, MD, PhD
10:40 am – 11:30 am    Neuroimaging Cases of Cognitive and Behavioral Disorders    Faculty

Upon completion of this seminar, attendees should be able to:
1) List the imaging modalities most helpful for the evaluation of patients with cognitive disturbances or dementia.
2) Indicate the role of amyloid imaging in the evaluation of dementia.
3) Describe the most common findings in the neuroimaging evaluation of cognitive impairment.

This course is designed to procure the following desirable physician attributes:  Medical Knowledge, Evidence-based Practice and Cognitive Expertise
This course is designed to procure the following desirable physician attributes:

1) List the imaging modalities most helpful for the evaluation of patients with cognitive disturbances or dementia.
2) Indicate the role of amyloid imaging in the evaluation of dementia.
3) Describe the most common findings in the neuroimaging evaluation of cognitive impairment.

Upon completion of this seminar, attendees should be able to:

- 10:40 am – 11:30 am Neuroimaging Cases of Cognitive and Behavioral Disorders
- Faculty: Joseph Masdeu, MD, PhD and Eduardo Gonzalez-Toledo, MD, PhD

Symposium: Neuroimaging of Cognitive and Behavioral Disorders
9:00 - 11:30 am
- Salons A-E
- CME: 2.5 Hours

This course will review the neuroimaging findings in psychiatric disorders and dementia and other cognitive disorders. In particular, the availability in the clinical setting of amyloid imaging will make an impact in the usefulness of neuroimaging in dementia prognosis in the short term and may help accelerate the discovery of new therapies. In this course, after two lectures, several cases will be discussed with the audience. This course is intended for neurologists, radiologists, fellows and residents interested in brain imaging.
AMERICAN SOCIETY OF NEUROIMAGING CME MISSION STATEMENT
The American Society of Neuroimaging (ASN) is an international professional organization representing neurologists, neurosurgeons, neuroradiologists, and other neuroscientists who are dedicated to the advancement of any technique used to image the nervous system. Its purpose is to promote the highest standards of neuroimaging in clinical practice, thereby furthering ongoing improvement in the delivery of medical care. ASN’s Annual Meeting educational activities are planned to meet the educational needs of physicians in practice and training in regard to the study of the nervous system with techniques including x-ray angiography and computed tomography, Magnetic Resonance Imaging, ultrasound, positron emission tomography and single photon emission computed tomography and near infra-red spectroscopy. Emphasis is placed on the correlation of the clinical data with information derived from the various methods used to image the nervous system and related structures (integrated neuroimaging) and on the updating of algorithms leading to a cost effective and efficient use of imaging modalities for the different disorders of the nervous system. The Society further supports and promotes Fellowships, Preceptorships, Tutorials, and Seminars related to neuroimaging held throughout the country. The courses address advances in the role of MRI, CT, and Neurosonology in Neurology and are designed to help practitioners and trainees improve their interpretation skills.

TARGET AUDIENCE
The material presented at the 35th Annual Meeting is appropriate for neurologists, radiologists, and other physicians and health care professionals involved in the diagnosis and treatment of patients with neurologic disease.

ACCREDITATION
The American Society of Neuroimaging is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

CREDIT DESIGNATION
The American Society of Neuroimaging designates this live activity for a maximum of 27.25 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

CME CERTIFICATES AND EVALUATIONS
CME certificates will be issued after the conclusion of the 2012 Annual Meeting. In order to receive your CME certificate you will need to submit an evaluation form for each course attended. In an ongoing effort to move to paperless format, evaluations will only be available online. All meeting attendees will receive an email after the meeting with a link to the evaluation.

Please note: You will only receive CME credits for the courses for which you have registered.
PRESIDENTIAL ADDRESS & AWARDS LUNCHEON
ASN Business Meeting AGENDA ■ Marriott Biscayne Bay – Miami, FL
Saturday, January 28, 2012 ■ 1:15-2:45 pm

1. Call to Order

2. Approval of Minutes – January 22, 2011, Business Meeting

3. Recognition of Service – Dara Jamieson, MD
   a) Recognition of Dr. Dubey’s service as Board Member
   b) Recognition of Dr. Greenberg’s service as Board Member
   c) Recognition of Dr. Preston’s service as Board Member
   d) Recognition of Dr. Sloan’s service as Board Member
   e) Recognition of Dr. Feldmann’s service as Treasurer

4. Slate of Candidates – Dara Jamieson, MD
   o Patrick Capone, MD – Board Position
   o Zsolt Garami, MD – Board Position
   o Vernon Rowe, MD, FAAN – Board Position
   o Gabriella Szatmary, MD – Board Position
   o Michael Hutchinson, MD, PhD – Board Position Second Term
   o William Preston, MD, FAAN – Treasurer

5. President’s Report – Dara Jamieson, MD

6. Practice Issues Committee Report – Michael Hutchinson, MD, PhD

7. Program Committee Report – Laszlo Mechtler, MD

8. Treasurer’s Report – Edward Feldmann, MD


10. Fellowship/Training Committee Report – Lazlo Mechtler, MD

11. John and Sophie Prockop Memorial Lectureship - Leon Prockop, MD
    Presented to: Sheena Xin Liu, MD, PhD
    Employing Symmetry Features for Automatic Misalignment Correction in Neuroimages

12. Presentation of the Qureshi Award – Adnan Qureshi, MD
The meeting was called to order by Dr. Lawrence Wechsler, President. On motion seconded and carried, the minutes from the January 2010 Business Meeting were approved as submitted.

PRESIDENT'S REPORT
Dr. Wechsler presented the history of neuroimaging and stressed the importance of ensuring future opportunities for neurologists to perform neuroimaging. Dr. Wechsler explained that the training guidelines task force is currently working on updating the training guidelines with the goal being to train residents to create independent reports. There is a need for more UCNS approved fellowships. UCNS previously required fellowships have a 2:1 faculty to fellow ratio, but this has since been reduced to 1:1. The fellowship director is required to be UCNS certified. The practice track for certification eligibility will remain in place until 2015. Dr. Wechsler also noted that it is important to maintain practice opportunities in neuroimaging, oppose limiting the scope of neuroimagers, and incorporate neuroimagers into academic neuroimaging.

Dr. Wechsler provided a summary of the 2011 Strategic Planning Meeting, during which the committee worked through an mission statement update, and identified the three most strategic opportunities for ASN. The identified opportunities are to increase membership, increase revenue for ASN, and enhance the role of neuroimaging in neurology.

Dr. Wechsler updated the membership on the recent AAN/ASN Summit which was attended by ASN leadership and current AAN President, Dr. Griggs and incoming AAN President, Dr. Sigsbee. Primary discussion points were how to best coordinate activities between the ASN and AAN, how to receive AAN support for neuroimaging activities, and assistance in Neuroimaging advocacy efforts.

Dr. Wechsler thanked Drs. Achari, Lindsay and Qureshi for their service on the Board of Directors and announced the new slate of candidates. He also thanked Dr. Jamieson for her work on the Program Committee and L&L for their administrative management of ASN.

On motion, seconded and carried, the membership approved the appointment of Drs. John Choi, Eric Lindzen and Erasmo Passaro to the Board of Directors. The membership approved Dr. Jamieson as the 2011-2013 ASN President and Dr. Mechtler as the 2011-2013 Vice-President and Program Chair.

PROGRAM COMMITTEE REPORT
Dr. Jamieson gave a brief overview of ASN meeting history. She reported there were 155 people registered for the 2011 meeting. The 2011 Program incorporated new educational components, Neuroimaging Jeopardy and a Neuroimaging Self-Assessment Examination. The 2012 Annual Meeting will be held in Miami, Florida, and the 2013 Annual Meeting will be held in Las Vegas, Nevada.

TREASURER'S REPORT
Dr. Jamieson reported for Dr. Feldmann. ASN currently has one year of expenses in reserve. At the end of the 2010 fiscal year, ASN had a deficit of $80,000. The projected 2011 budget will result in a $42,000 deficit. Dr. Jamieson outlined the reduction in the revenue. The manner in which revenue is received has changed, with half of

Presented to: Rakesh Khatri, MD
Frequency and Factors Associated with Unsuccessful Lead (First) Coil Placement in Patients Undergoing Coil Embolization of Intracranial Aneurysms

13. Presentation of Oldendorf Award – Dara Jamieson, MD
Presented to: Eugene Wang, MD
Cross-Sectional Comparison of White Matter Tracts in Early and Later Multiple Sclerosis Using Tract-Based Spatial Statistics

14. Presentation of McKinney Award – Dara Jamieson, MD
Presented to: Deepak Gupta, MD
A clinical, angiography and transcranial doppler score for predicting the long term clinical outcome in aneurysmal subarachnoid hemorrhage

15. Presentation of Trainee Travel Awards – Dara Jamieson, MD
Presented to: Gloria Varela, MD, and Julio Andino, MD

16. New Business

17. Adjourn
The meeting was called to order by Dr. Lawrence Wechsler, President.

On motion seconded and carried, the minutes from the January 2010 Business Meeting were approved as submitted.

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the earned revenue deferred to the following year. In an effort to offset the deficit, the advocacy expense for Ed Eichorn has been eliminated, general expenses have been limited, and Dr. Jamieson will decline the President’s Stipend.

**JOURNAL OF NEUROIMAGING (JON) REPORT**

Dr. Masdeu reported that the JON continues to do well. There has been growth in online viewing of articles and an increase in submissions. The Journal has a 35% acceptance rate and its impact factor remains steady at 1.7. Dr. Masdeu explained that due to the limited number of printed pages, there is a backlog of articles to be published. There are two ways to remedy this: one would be to have all case reports be available online only and the other would be to ask authors to shorten the length of their articles. Dr. Masdeu asked the membership for their opinion on which solution they prefer and the membership indicated that they prefer the second approach, or possibly a combination of both.

Dr. Masdeu encouraged the membership to submit items to the Section on News, advocate for institutional subscriptions and sponsor Journal supplements. He noted that it is $30,000 to sponsor a supplement. Dr. Masdeu also reported that a new feature will be added to the ASN website which will contain educational material for residents and fellows.

**FELLOWSHIP COMMITTEE REPORT**

Dr. Mechtler was pleased to report that DENT’s fellowship program is now approved by UCNS. ASN now has three UCNS approved neuroimaging fellowships. Dr. Mechtler encouraged the membership to cultivate additional fellowships and apply for UCNS certification.

**PRACTICE ISSUES COMMITTEE REPORT**

Dr. Hutchinson provided a brief overview of ASN advocacy efforts. He reported in the past, neurologists have been excluded from the National Quality Forum (NQF), though Dr. Mechtler has recently been named a voting member. There was a recent issue with CareCore as they were restricting trade on scans. Dr. Hutchinson invited the membership to stay for the Advocacy Seminar directly after the business meeting for further updates on ASN advocacy.

**AWARDS**

Dr. Prockop presented the John and Sophie Prockop Memorial Lectureship to Marc Ribo, MD, and Dr. Qureshi presented the Qureshi Award to Ameer Hassan, DO. Dr. Wechsler announced the Oldendorf Award recipient as Chun-Yi Wen, PhD, and the McKinney Award recipient as Arvind Sharma, MD. Dr. Wechsler presented the Trainee Travel Awards to Chun Huang, MD, Carey Taute, MD, and Ashkan Mowla, MD.

**PASSING OF THE GAVEL**

Dr. Jamison thanked Dr. Wechsler and recognized his service as ASN President. She then reviewed the current challenges facing ASN in 2011. She encouraged the ASN membership to consider sponsoring residents and fellows as junior ASN members and to reach out to clinician neuroimagers to collaborate on education and advocacy issues. She would also like to explore ways to make the ASN Annual Meeting more attractive to international attendees and expand meeting attendance. She reiterated the importance of ensuring resident neuroimagers reach a certain level of competence, which is the goal of the Training Guidelines Task Force.

There being no new business, the meeting was adjourned.

Respectfully submitted,

Shannon Wild
Associate Executive Director

SLW:lao
2012 AWARD WINNERS

Awards will be presented Saturday, January 28, 2012 during the Presidential Address and Awards Luncheon.

John and Sophie Prockop Memorial Lectureship
The John and Sophie Memorial Lectureship was established to enhance the scholarly and educational missions of the Society by honoring outstanding contributions made to the Society’s peer-reviewed journal, the Journal of Neuroimaging. The recipient of the Lectureship is the first author of a manuscript published in the journal that has been judged to have outstanding value to the development and success of the journal, or the highest quality manuscript published in the prior year as judged by the American Society of Neuroimaging Education Foundation Board of Directors.

2012 John and Sophie Prockop Memorial Lectureship Recipient
Sheena Xin Liu, MD, PhD
Philips Research North America
Brailcliff Manor, NY

Employing Symmetry Features for Automatic Misalignment Correction in Neuroimages
(Volume 21 Issue 2 Pages 15-33, April 2011)

Qureshi Award
The Qureshi Award is for the best manuscript based on research in diagnostic angiography or endovascular procedures.

2012 Qureshi Award Recipient
Rakesh Khatri, MD
University of Minnesota
Minneapolis, MN

Frequency and Factors Associated with Unsuccessful Lead (First) Coil Placement in Patients Undergoing Coil Embolization of Intracranial Aneurysms

Oldendorf Award
The Oldendorf Award is for the best manuscript based on research in CT, MRI, SPECT or PET.

2012 Oldendorf Award Recipient
Eugene Wang, MD
DENT Neurologic Institute
Buffalo, NY

Cross-Sectional Comparison of White Matter Tracts in Early and Later Multiple Sclerosis Using Tract-Based Spatial Statistics

McKinney Award
The McKinney Award is for the best manuscript based on research in neurosonology.

2012 McKinney Award Recipient
Deepak Gupta, MD
University of Alberta, Edmonton
Alberta, Canada

A clinical, angiography and transcranial doppler score for predicting the long term clinical outcome in aneurysmal subarachnoid hemorrhage
2012 AWARD WINNERS

Trainee Travel Awards
The Trainee Travel awards are presented to the three top-ranked abstracts submitted by a resident/fellow for poster presentations.

2012 Resident Travel Award Recipients

Gloria Varela, MD
University of South Alabama
Mobile, AL
Poster #51
In incidence of Congenital Vascular Malformations in Neonates: a Power Doppler Imaging prospective study

Julio Andino, MD
University of Texas Health Science Center at San Antonio
San Antonio, TX
Poster #9
Reperfusion is most associated with outcome in our intra-arterial thrombectomy cohort
1. Diffuse Cerebral Vasospasm Post-tumor Resection Mohammad Chmaysany, Yousef Hannawi, Santosh Murthy Baylor College of Medicine, Houston, TX, USA

Background: Diffuse cerebral vasospasm is a frequently observed complication following aneurysmal subarachnoid hemorrhage or after severe traumatic brain injury. However, symptomatic cerebral vasospasm following intracranial tumor resection is an underdiagnosed entity.

Patient and Methods: 55-year-old female with a petroclival meningioma, presented for resection of the mass due to intractable seizures and decreased right hand dexterity. She underwent an eleven-hour craniotomy and was discharged home on POD9 with mild slurred speech. Patient was readmitted on POD11 for evaluation of a four-day history of slurred speech and lethargy.

Results: MRI showed patchy acute infarcts in the left posterior frontal, parietal and occipital lobes, parietal region, corpus callosum, splenium, mesial temporal lobe, hypothalamus, and bilateral pontomesencephalic junctions. MRA was significant for diffuse vasospasm, including: 1) severe stenosis, bilaterally, 2) significant stenosis in the proximal ACA A1, MCA M1, and ACA A2 segments 3) severe or near-severe stenosis in the transverse and sigmoid sinuses and straight sinus. In mid basilar artery and proximal PCA. Four- vessel angiogram confirmed the aforementioned findings. Patient was subsequently treated with angioplasty and intracarotid nicardipine.

Conclusions: Unexplained, fluctuating neurologic deficits after extensive craniotomies should raise the concern for possible cerebral vasospasm. Although rare, as this case illustrates, it can occur in vascular distributions far removed from the surgical site. Aggressive treatment, including both hemodynamic augmentation and endovascular methods should be pursued in the setting of postoperative vasospasm. Early recognition and prompt treatment can improve the morbidity in these complex patients.

2. Use of the Penumbra System 054 Plus Chemical Thrombolysis for Multifocal Venuous Sinus Thrombosis Fazeel Siddiqui, Glenn Frider, Jessica Lee UT Southwestern Medical Center, Dallas, TX, USA

Introduction: Multifocal venous sinus thrombosis (CVST) has a high mortality rate (38%-53%). Medical anticoagulation rates range from 15% to 30%. Venous thromboembolism ranges concern about the associated risk of intracranial hemorrhage. Most of the mechanical thrombectomy devices have technical limitations. We report a case of CVST in which a new-generation Penumbra 054 was used along with local ICA infusion. The large lumen design of Penumbra 054 provides compatibility with other microcatheters if additional therapies are required.

Patients (or Materials) and Methods: Case report

Results: A 54-year-old lady with diabetes and hypertension presented with 3 days history of headache followed by unconsciousness. Head CT revealed extensive CVST involving multiple venous sinuses and left frontal lobe ischemic infarction. On examination, patient was comatose with extensor posturing to painful stimuli. A heparin drip was started. The patient underwent cerebral angiography, showing thrombosis in the superior sagittal sinus, right transverse and sigmoid sinus as well as straight sinus. In a two day procedure, venous sinuses were catheterized using the Penumbra-054 device in conjunction with local catheter delivered over- the- wire Micro- Embolus Aspiration catheter. Multiple mechanical clot aspirators were performed using Penumbra. Secondary venous sinus thrombosis showed marked improvement of the overall patency of the superficial and deep sinuses. Patient gradually regained consciousness on hospital day 5. She was discharged on warfarin. At discharge, she was oriented to name, follow commands and had residual right hemiparesis.

Conclusions: This is the first reported use of Penumbra system 054 in conjunction with ICA infusion. New devices such as the Penumbra system may offer additional therapeutic options in the treatment of multifocal CVST.

3. Value of Other Endovascular Techniques among Patients with MERCI Device Failure during the Treatment of Acute Ischemic Stroke: What to do When MERCI Fails? Ameer E. Hassan, Mansoor M. Aman, Saqib A. Chauhdry, Mikayel Grigoryan, Wendrown G. Tekele, Gustavo J. Rodriguez, Adnan I. Qureshi Zeenat Qureshi Research Center, University of Minnesota, Minneapolis, MN, USA

Introduction: The MERCI Retrieval was the first FDA approved device for thrombectomy in patients with acute ischemic stroke. It remains one of the most commonly used devices today despite its failure to restore blood flow in approximately 30% of the occlusions after technically successful deployment. It remains unclear whether additional endovascular techniques or continued MERCI use can achieve recanalization post-MERCI failure.

Methods: Pre- and post- treatment cerebral angiogram was classified using the Quebec Grading Scale (QGS). Recanalization was defined as a ≥1 grade improvement in pre- and post- treatment cerebral angiogram in the QGS. We compared the angiographic and clinical results of continued use of MERCI retrieval versus other endovascular techniques in patients with MERCI failure. Results: 40 patients (52% men) had MERCI retrieval with mean age (±standard deviation) of 66.8 years ±16 and mean admission NIHSS score of 16.8 ±6.7. Of the 40 patients treated with MERCI retrieval, there were 26 patients with MERCI failure. In group 1, there were 11 patients who underwent continued MERCI use and group 2 13 patients who underwent other endovascular techniques. There was no significant difference in age or risk factors between the groups. The rate of recanalization (82% versus 80%, p = 1.0), asymptomatic intracranial hemorrhage (18% versus 13%, p = 0.77) and favorable outcome at discharge (27% versus 20%, p = 0.66) were similar.

Conclusion: In cases where the MERCI device is unsuccessful, additional mechanical thrombectomy can result in recanalization and provide comparable rates of favourable outcome.

4. A Case Series of CT Perfusion Imaging in Seizure Erin Canale,1 Mouhammad Jamaa,1 Ken Uchino,2 Alexandro Popescu1 1University of Pittsburgh Medical Center, Pittsburgh, PA, USA, 2Cleveland Clinic, Cleveland, OH, USA

Background and Purpose: Differentiating between nonconvulsive status epilepticus (NCSE) and a post-ictal state can be challenging without the availability of emergent EEG. CT perfusion (CTP) is used to quickly assess perfusion state can be challenging without the availability of emergent EEG. CT perfusion (CTP) is used to quickly assess perfusion abnormalities by cerebral blood flow (CBF) measurement. CTP may help identify patients with NCSE.

Methods: Retrospective analysis to test the hypothesis that perfusion abnormalities were reported as consistent with Fahr's disease. Patients with seizures may have increased or decreased perfusion by cerebral blood flow (CBF) measurement. CT perfusion (CTP) is used to quickly assess perfusion abnormalities by cerebral blood flow (CBF) measurement. CTP may help identify patients with NCSE.

Results: Seven patients presenting after a clinical seizure had perfusion by cerebral blood flow (CBF) measurement. Seven of the 8 (87.5%) patients with electrographic seizures had increased regional perfusion on CTP. Seven patients with electrographic seizures had increased or decreased perfusion by cerebral blood flow (CBF) measurement. CTP may help identify patients with NCSE.

Conclusions: CTP may help identify patients with NCSE. Differentiating between NCSE and normal EEG is critical to ensure that patients with NCSE are treated appropriately.

5. Intracerebral Hemorrhage Secondary to Autonomic Dysfunction in a Patient with Guillain-Barré Syndrome Laurice Yang, Nerxes Sanossian University of Southern California, Los Angeles, USA

Background and Purpose: There have been no reports on hemorrhagic stroke as an acute sequelae of Guillain Barré Syndrome (GBS) related dysautonomia. We present a case where a patient with normal neuroimaging at baseline developed intracerebral hemorrhage (ICH) following dysautonomia related severe hypertension secondary to GBS.

Methods: Case report with neuroimaging

Results: 70 year old female presented for bilateral facial diplegia, acute dystarthis and left leg weakness and was diagnosed with GBS by clinical exam and lumbar puncture (WBC 1, protein 107). She was started on IVIG for a 5 day course with improvement noted. The patient’s blood pressure, however, remained very erratic. Her systolic blood pressure would range from 80s to 180s. Propranolol 80mg every 8 hours was started however no further adjustments were made as treating the hypertension more aggressively would risk significant hypertension. The patient was transferred to the ICU for closer monitoring of blood pressure.

Conclusions: This is the first reported case to our knowledge of dystarthis secondary to Guillain-Barré Syndrome leading to hypertensive intracerebral hemorrhage.

2012 ASN Annual Meeting Program
7. Burden of Leukoencephalopathy in Acute Intracerebral Hemorrhage is Not Associated with Hemorrhage Expansion and Clinical Deterioration

Nurses Sanossian, 1 Adrian Burgos, 1 David Liebeskind, 1 Leonid Groyzman, 1 Vahe Akopian, 1 Sidney Starkman, 2 Jeffrey Saver 2

1University of Southern California, Los Angeles, CA, USA, 2UCLA Stroke Center, Los Angeles, CA, USA

Background: Leukoencephalopathy (LA) is a frequent finding in patients presenting with intracerebral hemorrhage (ICH) may represent a distinct phenotype with higher rates of hemorrhage expansion and/or clinical deterioration.

Methods: Consecutive subjects with ICH participating in FAST-MAG clinical trial had baseline and follow-up imaging analysis by radiologists for hemorrhage location, presence of IVH, and leukoencephalopathy (Fazakas scale for periventricular and deep white matter changes, 0–3 for each). ICH volume was measured using the ABC-2 method, expansion defined as volume increased by ∼33% and/or 12.5 ml. Clinical deterioration was defined as a ≥2-point decrease in Glasgow Coma Score (GCS) between paramedic and ER evaluations.

Results: There were 127 baseline [mean ±SD (35) minutes after onset] and 105 follow-up (median 21[QR 12–24] hours after baseline) images analyzed. ICH was in the lentiform nucleus (42%), thalamus (40%), and cortex (4%); IVH in 45 (33%) cases. Moderate to severe (Fazakas grades 2–3) leukoencephalosis was common in the periventricular (58%) and deep regions (53%). Patients were aged 66 (SD) years, 34% women, average intracranial hemoglobin 7.2 (SD) g/dL at 48±21 minutes after onset with a median (IQR) GCS of 15 (15–15). Initial volume was 15 (7–30) cm3/ml, with an absolute increase of 11 (4–27) cm3/ml. Expansion occurred in 37/105 (35%) cases. Early neurologic deterioration occurred in 37/127 (29%) patients. Overall combined leukoencephalosis score, and individual deep/periventricular scores were no associated with hematoma size, hematoma expansion, and clinical deterioration. There was no association which reached the threshold of p < 0.10 to trigger multivariable analysis.

Conclusion: High burden of leukoencephalosis in acute ICH was not associated with rates of hemorrhage expansion and clinical deterioration.

8. Superior Sagittal Sinus Thrombosis Caused by Dehydration Presenting with Ataxia and Fluctuating Leg Weakness. Case Report

Yazan Suradi, Eugeniu Muntean, Derrick Robertson, Lingling Rong

University Of South Florida, Tampa, FL, 33612, USA

Introduction: Cerebral venous sinus thrombosis (CVT) is uncommon cause of stroke and potentially fatal. Common causes include dehydration, malignancies, hypercoagulable disorders, and oral contraceptive use.

We report a case of superior sagittal sinus thrombosis caused by severe dehydration that presented with bilateral lower extremity (BLE) weakness.

Patients (or Materials) and Methods: A 63-year-old man presented with BLE weakness, unsteady gait/ataxia and recurrent falls. He was also diagnosed with a glioblastoma multiforme. One week prior these symptoms he required hospital admission and aggressive intravenous hydration for severe dehydration.

Patient had been attempting to lose weight by not using air conditioning while at home causing him to excessively sweat. Examination showed normal mental status and cerebellar, frontal, and optic nerves, mild proximal BLE weakness, wide-based gait.

Results: An extensive work-up was conducted. Serum studies including electrolytes and liver function were normal. Electroencephalography/nerve conduction study showed mild lumbar radiolucency. Initial CT head was negative whereas follow-up CT head showed extensive cases revealed evolving hypodensities within the high convexity brain parenchyma central and bilateral. CT venography (CTV) head was completed and confirmed patency of all major dural venous sinuses. Given recanalization of superior sagittal sinus with dehydration along with removal of the glioblastoma, recipient strength and balance therapy improved in his symptoms.

Conclusion: CTV is a rare cause of stroke that historically associated with a high mortality rate. The common presentation of CVT is ophthalmic symptoms which includes the combination of motor deficits, headache, seizures and coma. In our patient the only etiological factor for thrombosis formation was dehydration which increases blood viscosity. Aggressive dehydration led to recanalization of the sinus confirmed on CTV. Severe dehydration in isolation can cause CTV with unusual presentation including ataxia and fluctuating BLE weakness.

9. Reperfusion is Most Associated with Outcome in Our Intra-Artial Thrombectomy Cohort

Julio Andino, Santiago Palacio, Lee Birnbaum

University of Texas Health Science Center San Antonio, San Antonio, TX, USA

Introduction: Acute stroke patients with more distal middle cerebral artery (MCA) occlusions often present with lower NIHSS scores and have better outcomes. Therefore, these patients may not qualify for IA thrombectomy due to a less favorable risk-benefit ratio. We hypothesized that patients in our cohort with distal MCA occlusions on baseline CTA would have better outcomes than those with proximal occlusions.

Patients (or Materials) and Methods: We did a retrospective review from January 2009 to June 2011. Site of occlusion was classified as supraopercular ICA, M1 segment, and M2 segment. Degree of reperfusion was based on TICI flow: none, minimal, partial, and complete. Good and poor outcomes were defined as discharge to home or acute rehab facility and to a nursing facility, hospice, or death, respectively.

Results: 39 subjects (mean age 68 years ± 16, 51% women, 56% White, 36% Hispanic, 5% Black) were included. 19 (49%) received IV ICA; 6 (16%) had ICA; 20 (51%) had M1, and 13 (33%) had M2 occlusions. Reperfusion rates were as follows: 5 (13%) none, 7 (18%) minimal, 18 (46%) partial, and 9 (23%) complete. 22 subjects (56%) had poor outcomes. In multiple regression, degree of reperfusion was associated with good outcome (p = 0.05).

Conclusion: In multiple regression analysis, degree of reperfusion, rather than size of occlusion, was significant and most predictive of outcome. Therefore, qualifying stroke patients should not be denied IA therapy based on site of occlusion alone. After recanalization, a favorable risk-benefit ratio for patients with distal occlusions who undergo IA thrombectomies.

10. Neuroimaging in Amyotrophic Lateral Sclerosis

Prabhu Emmady, Palak Shah, Jayant Acharya

Penn State-Hershey Medical Center, Hershey, PA, USA

Introduction: Amyotrophic lateral sclerosis (ALS) is a degenerative disease associated with a high mortality and morbidity. EMG is the gold standard for its diagnosis, but there are other possible etiologies as well as in predicting clinical outcomes. These cases highlight the utility of MR imaging in identifying ADRs or drug toxicity in the CNS related to pharmacologic therapy.

Conclusion: Familiarization with MRI appearance of ADRs is crucial in establishing a correct diagnosis. MRI may be useful in identifying ADRs involving the CNS from other possible etiologies as well as in predicting clinical course and outcome.

11. Radiological Manifestations of Adverse Drug Reactions in the Central Nervous System

David Van Wyck, John Hotchkiss, Sarah Gibbons, Michael Krasnowsky

Madigan Army Medical Center, Tacoma Washington, USA

Introduction: Magnetic resonance imaging (MRI) may be used to help identify the diagnosis and/or predict clinical outcome of adverse drug reactions (ADRs)/drug toxicity involving the central nervous system (CNS).

Patients and Methods: Patients with adverse drug reactions involving the CNS secondary to pharmacologic therapy with positive MRI are presented in this series. Among these are cases of a reversible lesion in the splenium of the corpus callosum that has been reported with antiepileptic medications, a case of cerebral white matter toxicity secondary to methotrexate use, a case of posterior reversible encephalopathy syndrome associated with cyclosporine, and a case of progressive leukoencephalopathy occurring with natalizumab in a multiple sclerosis patient.

Results: Many pharmacologic therapies have adverse side effects involving clinical manifestations attributed to drug effects on the CNS. This identification can be difficult as most clinical CNS manifestations have a large differential diagnosis particularly when it involves patients with complex medical histories or patients on multiple pharmacologic agents. MRI may provide radiologic findings that help distinguish drug effects from alternative diagnoses as well as helping to predict clinical course and outcomes. These cases highlight the utility of MRI imaging in identifying ADRs or drug toxicity in the CNS related to pharmacologic therapy.

Conclusion: Familiarization with MRI appearance of ADRs is crucial in establishing a correct diagnosis. MRI may be useful in identifying ADRs involving the CNS from other possible etiologies as well as in predicting clinical course and outcome.

12. Variability in Diagnosing Creutzfeldt-Jakob Disease (CJD) Using Standard and Proposed Diagnostic Criteria

Christopher Newey, Dolora Wisco, Shazia Alam, Richard Lederman

Cleveland Clinic, Cleveland, OH, USA

Introduction: CJD is a rapidly progressive dementia with a median survival of 2–14 months. The diagnosis can only be made accurately by biopsy/histology. However, this is not always feasible or desirable. Thus, diagnostic criteria have been proposed by UCSF, European MRI CJD Consortium, and WHO. We aim to compare these criteria.

Patients and Methods: Retrospective study of 31 patients (average age of 69 years) by ICD9 codes 406.1, 406.11, and 406.19 between 2003 to 2010.

Results: All patients presented with rapidly progressive dementia (mean duration of 4.25 months). Pyramidal and extrapyramidal findings, myoclonus, cerebellar changes, akimotic mutism, and visual disturbances were observed in 6.5 ± 4.8. Five had positive EEG. C4/C5. MRI showed T2 and FLAIR hyperintensities along the motor tracts (fibrillary pattern) suggestive of a motor neuron disease. ALS was confirmed by electromyography (EMG) (Table on post).

Conclusion: Treatment of CJD is most suspected in patients with mixed upper and lower motor neuron signs. Cerebral spine disease does not cause pyramidal, akinetic/jaw or cerebellar signs. In this study, analysis reveals atrophy of the precentral gyrus and upper motor neuron tracts. MRI may reveal these changes in subtle hyperintensities, which can aid the diagnosis.

Chun-yi WEN, jiao-long Cui, Kin-cheung Mak, Yong Hu, Keith Dip-Kei L Luk
The University of Hong Kong, Hong Kong, Hong Kong

Introduction: The blood oxygen level-dependent (BOLD) functional magnetic resonance imaging (fMRI) is a promising neuroimaging tool to evaluate the neuronal function in central nervous system. This study aimed to investigate the neuronal activity of spinal cord in cervical spondylotic myelopathy patients using BOLD fMRI.

Patients (or Materials) and Methods: A total of 18 volunteers were recruited in this study with informed consent including 15 healthy subjects (33±13 yrs) and 3 CSM patients. BOLD fMRI was performed under interlaced unilateral finger tapping tasks. The BOLD signals were collected using the single-shot gradient echo planar imaging (GE-EPI) sequence with a 3-T MRI system. A total of thirteen slices were obtained from C1 to C8 to cover the whole length of cervical spinal cord. The activation in each slice and intensity of BOLD signal changes were measured for comparison.

Results: The BOLD signals could be consistently detected in healthy cord. The intensity of BOLD signals was relatively higher at the lower cervical spinal cord (C5–C8) than the upper part (C1–C4). As compared with the healthy, the activations significantly dropped in myelopathic spinal cord, particularly at C5–C8. Yet the intensity of each activation voxel at C1–C4, as compared with the healthy, remained relatively higher in the CSM.

Conclusion: This study firstly demonstrated the feasibility of BOLD fMRI in detection of neuronal activities in CSM. The drop in activation volume of myelopathic spinal cord indicated this neuronal dysfunction, and the relatively higher intensity of each activated voxel might reflect the potential compensatory mechanism in myelopathic spinal cord.

14. Commonly Carried Folate Gene, MTHFR, Promotes Brain Deficits in the Cognitively Impaired Elderly

Priya Rajagopalan, Neda Jahanshad, Jason Stein, Omid Kohanmim, Derrek Hibar, Xue Hua, Arthur Toga, Clifford Jack, Robert Green, Michael Weiner, Andrew Saykin, Paul Thompson Alzheimer’s Disease Neuroimaging Initiative ADNI UCLA, Los Angeles, CA, USA

Introduction: A gene variant carried by over 35% of US population in the MTHFR folate-gene is known to cause higher plasma homocysteine levels. Homocysteine is damaging to neurons and the vasculature and is a known promoter of brain atrophy. Cognitively impaired elderly including Alzheimer’s disease are known to have higher levels of homocysteine and also have significant brain atrophy. So here we set out to test if MTHFR gene promotes detects brain deficits/structural changes in cognitively impaired elderly people carrying the C677T risk-conferring variant.

Patients (or Materials) and Methods: 529 cognitively impaired elderly Caucasian subjects (173 Alzheimer’s Disease, 356 Mild Cognitive Impairment; mean age: 73±6–8 yrs) were recruited with brain MRI and genotyped as part of ADNI study. Using tensor-based morphometry, we generated 3D maps of regional brain differences across the cohort and measured changes with respect to a mean template. At each voxel in the brain, we tested to see where regional volume differences were associated with carrying of one or more MTHFR-risk allele. We corrected for multiple comparisons using False Discovery Rate (FDR) 0.05.

Results: Carriers of MTHFR-risk variant showed significant brain volume deficits bilaterally in the fronto-parietal white matter, up to 7.7% per risk allele after controlling for age, sex, education and vitaminB12 status. These very regionally were also implicated with homocysteine-mediated atrophy.

Conclusion: This highly prevalent C677T risk-conferring variant in the MTHFR gene influenced brain structural deficits in similar brain regions as homocysteine, which it also affects. This novel finding elucidates one pathway to brain atrophy in the cognitively impaired elderly.

15. Treatment Resistance Rapidly Progressive Amyloid Beta-related Angiitis: A Case Report

Meko Porter, Christopher Newey, Gabor Toth, Joao Gomes
Cleveland Clinic, Cleveland, OH, USA

Introduction: CNS vasculitis is often suspected when there are multiple areas of restricted diffusion on MRI along with vessel narrowing on angiography. Amyloid beta-related angiitis (ABRA) is a rare form of CNS vasculitis that has a poorer prognosis when compared to other CNS vasculitides. However, this case of vasculitis has been shown to be quite responsive to steroids and immuno-modulating agents like cyclophosphamide. We present a case of amyloid angiitis who failed immunosuppression.

Patients (or Materials) and Methods: Case review

Results: We report a case of a 76-year-old woman with no significant past medical history except for asthma, hypertension, and hypothyroidism who experienced an isolated seizure in April 2010 followed by episodes of aphasia, headaches, and right sided weakness over one month. MRI showed an acute posterior lesion but repeat MRI fifteen days later showed an increase in acute hemorrhagic infarcts correlating with the patient’s clinical decline. Brain biopsy during this time showed granulomatous angiitis with amyloid deposition. Autopsymunic was negative. She never improved clinically despite treatment with steroids and cyclophosphamide.

Conclusion: This case highlights failure of beta amyloid related angiitis to immunosuppression which has not been the outcome in previous reported cases of this rare vasculitis. It is presumed our patient did not respond secondarily to her rapid disease progression and/or older age at symptom onset which may have led to an overall poorer prognosis than that seen in other patients with ABRA who typically improve within 2–3 weeks of initiating treatment.

16. The MCP Sign: A Peculiar Peduncle for the Pedigree

Jonathan Beary, Andrey Stojic, Ilia Ilin
Cleveland Clinic, Cleveland, OH, USA

Introduction: Middle Cerebellar Peduncle (MCP) T2/FLAIR hyperintensity with clinical features increases suspicion for Fragile X Associated Tremor/Ataxia Syndrome (FXTAS) and should prompt Fragile X mental retardation 1 (FMR1) gene testing. Genetic counseling recommended his family undergo FMR1 gene testing due to their risk of Premature Ovarian Failure and Fragile X Syndrome.

Results: FXTAS is a common late-onset neurodegenerative disorder caused by CGG trinucleotide expansion in the FMR1 gene in males and females. FXTAS genetic counseling recommended his family undergo FMR1 gene testing due to their risk of Premature Ovarian Failure and Fragile X Syndrome.

Conclusion: FXTAS is a common late-onset neurodegenerative disorder caused by CGG trinucleotide expansion in the FMR1 gene in males and females. FXTAS genetic counseling resulted in full family testing, which confirmed FXTAS in a female relative. Genetic counseling recommended his family undergo FMR1 gene testing due to their risk of Premature Ovarian Failure and Fragile X Syndrome.

17. Withdrawn

18. Large Vessel Occlusion is Associated with Penumbra in Patients with Acute Ischemic Stroke

Ty Shang, Dilee Yapagal
Jackson Memorial Hospital/University of Miami, Miami, FL, USA

Introduction: Penumbra reperfusion is the main target of thrombolysis in acute ischemic stroke. By identifying penumbra, it may be possible to avoid unnecessary therapy and complication, and improve clinical outcome. To predict the presence of penumbra accurately and rapidly in clinical practice remains challenging. We sought to identify factors that could be associated with penumbra in ischemic stroke.

Patients and Methods: Stroke database from January 2008 to January 2010 were reviewed. Inclusion criteria include patients with ischemic stroke presented with NIHSS ≥5 or aphasia, within 0–12 hours from symptom onset, and had MRI studies. The presence of penumbra was determined by MR Perfusion-Diffusion mismatch (DDM) or Clinical Diffusion mismatch.

Results: A total of 72 patients met the inclusion criteria (age 66, male 54%, median NIHSS 15.5). The average time from symptom onset to first MRI image was 338 ± 151 min. Sixty three (71%) patients were evaluated by PDM. Penumbra was found in 35 (48%) patients. Large artery occlusion was a stronger predictor for the presence of penumbra with OR of 150 (95% CI 9.2 to 242). The specificity and sensitivity were 91.4% and 81.1%, respectively. However, penumbra was uncommon in patients with mixed or no history of congestive heart failure (EF < 45%) and hyperlipidemia (serum total cholesterol > 200mg/ml). These patients had significant large DWI lesions.

Conclusion: Large artery occlusion is associated with penumbra in majority of the patients with acute ischemic stroke within 12 hours from symptom onset.

19. Brain Activations Due to Cue Induced Craving as Abstinence-Based Treatment Outcome Predictor among Heroin Dependents

Hamed Ekhatri, Habib Ganjighi, Peyman Hasani-Abharian, Hossein Tabatabaei, Mohammad Ali Oghabian
1Institute for Cognitive Science Studies, Tehran, Iran, 2Iranian National Center for Addiction Studies, Tehran University of Medical Sciences, Tehran, Iran, 3Research Center for Science and Technologies, Tehran University of Medical Sciences, Tehran, Iran, 4Center for Nicotine and Smoking Cessation Research, Duke University Medical Center, Durham, NC, USA

Introduction: Heroin craving, which is processed in a network of brain regions including areas involved in reward, motivation and attention, has a determining role in relapses and treatment failure. The role of each part of this brain network in treatment outcomes and activity pattern changes in this network after a period of abstinence is not well understood.

Patients (or Materials) and Methods: 17 male heroin-dependents prior to undergoing to the treatment (PreTx phase) and after 4 weeks abstinence in a residential program (Post Tx phase) underwent MRI sessions during which they viewed heroin-related and control cues. 9 (52%) subjects remained abstinent for 3 month after treatment initiation (successful subjects).

Results: There were significant right-sided activations in PreTx phase over PostTx in hippocampus, Thalamus, Posterior Cingulate Cortex, Cingulum and Occipital Cortex. After a period of one month abstinence, Left Anterior Cingulate Gyrus, Right Medial Frontal Gyrus, and Left Superior Frontal Gyrus showed significant activations (PostTx > PreTx). In drop-out cases (n = 8), at PreTx
Fig 1. Axial T2-weighted MR of the cervical spine in the C4-5 region demonstrating a bulging disc (arrow) causing left nerve root narrowing.

Images, Right and Left Culmen and Left Posterior Cingulate Cortex were activated more than successful subjects.

Conclusion: One month heroin abstinence could change brain responses to drug related cues significantly both in subjective self-reports and objective imaging data. This study may suggest that some activation in cerebellum (culmen) and posterior cingulate cortex during cue induced craving in pre-abstinence phase could predict treatment failure after 3 months of treatment admission among heroin dependents.

20. Correlation between Magnetic Resonance Images and Tumor Consistency in Meningiomas Amir Hamdi,1 Ghaffar Shokouhi,1 Mohammad Hosein Daghighi,1 Haleh Hamdi,1 Aimaz Afrom1
1Neurosciences Research Center - Tabriz University of Medical Sciences, Tabriz, East Azerbaijan, Iran, 2Shahid Beheshti University of Medical Sciences, Tehran, Tehran, Iran

Introduction: The tumor consistency is one of the important factors that can help preoperative planning for meningiomas. In the present study the authors aimed to determine whether magnetic resonance imaging (MRI) could predict supratentorial meningioma consistency.

Patients and Methods: We prospectively analyzed 34 consecutive patients with supratentorial meningioma using 1.5 Tesla MRI. The MRI intensities of the tumors were categorized into “low”, “iso”, and “high” compared to that of the gray matter and the consistency of the tumors were classified into “hard” and “soft” based on operative findings. We compared the MRI findings with tumor consistency.

Results: Of the 34 tumors, 15 were classified as hard and 19 as soft. We found no relationship between T1-weighted images and the consistency of meningiomas. Hyperintensity on T2-weighted images was correlated with soft tumor consistency (P < 0.001) as the hyperintensity on proton density (PD) and FLAIR images was (P = 0.048 and P = 0.001, respectively). Hyperintensity both on T2 and FLAIR images could correctly predict soft meningiomas in 68.4%.

21. BOLD-MRI Analysis of Functional Connectivity Using Contextual and Temporal Information Saman Sargolzaei,1 Pranitik Kundu,1 Akmal Younis,1 Gang Chen,4 Fatta Nahab2
1Department of Electrical Engineering, University of Miami, Miami, Florida, USA, 2Department of Neurology, University of Miami, Miami, Florida, USA, 3Section of Functional Imaging Methods, National Institute of Health, Bethesda, Maryland, USA, 4Scientific and Statistical Computing Core, National Institute of Mental Health, Bethesda, Maryland, USA

Introduction: A variety of techniques (e.g. data driven, model based) have been developed to explore the brain’s cortical networks using Pearson correlations. The need of conventional methods to have a priori knowledge of the experimental time course, predicted hemodynamic responses, and seed selection limit the ability to evaluate connectivity throughout the entire brain or across neural networks. The present study introduces a new voxel-wise metric to measure the degree of connectivity between and within regions in response to sequential voluntary right finger movements followed by rest using GRE-EPI sequence on a GE Sigma 3T MRI along with 3D-SPGR structural scan. Images were preprocessed using Freesurfer, the whole brain parcellation map was generated using a voxel wise linear regression followed by measurement of a cosine distance metric between the vectors of correlation values sourced at gray matter and second vector (values sourced at CSF and white matter). Resulting data was manipulated by a deconvolution-reconvolution with a Gamma variate function to calculate the psychophysiological interaction.

Conclusion: Regions identified using this methodology include contralateral primary somsensmotor cortex, bilateral SMA, ipsilateral cerebellum and thalamus.

22. MRI More Useful Than PET for Diagnosis of Heidenhain Variant Creutzfeld-Jacob Disease Jonathan Beary, Susan Samuel, Edward Manno
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Introduction: MRI is able to detect subtle focal cortical abnormalities in the Heidenhain variant of Creutzfeld-Jacob Disease (vCJD) and can prove more useful than PET imaging.

Patients (or Materials) and Methods: A 70 year old right handed man with malnourishments and visuospatial disorientation with worsening ataxia followed by progressive anterograde amnesia and cortical blindness. Six weeks later he was comatose with staurine myoclonus. A sharply-contoured periotic pattern was evident posteriorly on continuous EEG monitoring with brain MRI revealing subtle bilateral occipital cortical diffusion restriction. PET brain imaging showed diffuse non-focal cortical hypometabolism. Both cerebrosal fluid (CSF) 14-3-3 and tau protein studies were positive. EEG progressed to refractory status epileptics and the patient died four days later. The presence of abnormal brain pastease-resistant prion protein and MM1 genotype at autopsy supported the diagnosis of vCJD.

Result: While PET brain imaging is reportedly able to detect focal cortical abnormalities in vCJD with greater sensitivity than MRI early in the disease, this is not absolute. When combined with EEG periodic sharp waves and a clinical history of visual disturbance and dementia, MRI showing isolated occipital lobe diffusion restriction suggests hvCJD and should prompt CSF 14-3-3 and tau protein analyses. These investigations were important to the diagnosis and early intervention in this aggressive disease.

Conclusion: hvCJD should be considered in patients with rapid onset classic visual disturbance and dementia. When combined with EEG and CSF analysis, isolated MRI visual cortex diffusion restriction is suggestive of this ultra-aggressive prion variant and may be more useful than simply PET imaging.

23. Extrapontine Myelinolysis: Complete Radiologic Resolution with Intravenous Immunoglobulin Santosh Murthy, Yousef Hannawi, Mohamad Chmayssani
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Introduction: Extrapontine myelinolysis (EPM) is a rare opportunistic infection syndrome secondary to rapid correction of hypotreatemia, which involves the basal ganglia, thalamus, cerebellum, and classically spares the pons. We describe one such case of EPM, which responded to intravenous immunoglobulin (IVIg) therapy.

Patients: A 20 year-old Asian female presented with a one-month history of intractable nausea, vomiting. She was previously treated at an outside hospital for severe hypovolemic hyponatremia (sodium 97 mmol/L) with normal saline and her serum sodium had been corrected to 134 mmol/L, in 48 hours. Neurological exam at presentation revealed rigidity, diffuse hyper-reflexia with clonus in the lower extremities.

Result: MRI of the brain showed symmetric hyperintensities in the caudate nuclei and putamen bilaterally, on T2 and FLAIR sequences. She was diagnosed with EPM. A trial of Intravenous Immunoglobulin (IVIg) for five days resulted in significant improvement in symptoms.

Conclusion: The reported case demonstrates complete resolution of extrapontine lesions following IVIg therapy. Possible explanations for the success of IVIg include the reduction of myelotoxic substances and anti myelin antibodies, and promotion of remyelination. This case highlights the importance of the need for strict regulation of sodium correction with emphasis on IVIg as a therapeutic option for EPM.

24. Chronic Sagittal Sinus Thrombosis: An Uncommon Presentation of Neurosarcoïdosis Yousef Hannawi, Santosh B. Murthy, Mohamad Chmayssani
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Introduction: To review the case of an Asian female who was resticted in her activities due to chronic sagittal sinus thrombosis in the presence of neurosarcoïdosis.
Introduction: Neurosarcoidosis occurs in 5% of patients with sarcoidosis. Chronic sinus venous thrombosis as a presentation of sarcoidosis is very rare. We describe one such case of newly diagnosed systemic sarcoidosis who had similar findings.

Patients and Methods: A 56 year old Caucasian male presented with a one-year history of headache. The headache was associated with nausea, vomiting, and photophobia and dizziness. Neurological exam did not reveal any remarkable abnormalities.

Results: CT-scan of the head showed nonspecific thickening of the falx cerebi. MRI, MRA and MRV imaging of the brain showed diffuse smooth pachymeningeal enhancement and chronic superior sagittal sinus thrombosis. Lambar puncture revealed a mild elevation of protein concentration (62 mg/dl) and a normal cell count. Opening pressure measured 34 cm H2O. Whole body CT-scan revealed diffuse mediastinal and hilar lymphadenopathy. Lymph node biopsy revealed non-caseating granulomas. Whole body [111m]F-FDG PET scanning showed extensive avid mediastinal uptake and hilar lymphadenopathy. Ophthalmological examination was consistent with bilateral chronic granulomatous anterior uveitis. All of the viral and fungal cultures remained negative.

Conclusion: This case highlights chronic sinus venous thrombosis as an unusual presentation of neurosarcoidosis. Other associated radiologic features such as meningeal enhancement, periventricular white matter lesions, enhancing parenchymal lesions, dural mass lesions, hydrocephalus, cranial nerve involvement or spinal or cord lesions, should raise the suspicion of this diagnosis.

25. Spinal Cord Infarction in a Healthy 14 Year Old Boy

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Introduction: Spinal cord infarction is rare in children, especially if not triggered by acute surgery or arterial hypotension. In children, the MRI findings and clinical presentation can be very similar to transient transverse myelitis, making it more difficult to diagnose.

Patients (or Materials) and Methods: 14 years old boy, presents with sudden onset of chest pain followed by diffuse weakness after playing basketball. Exam was pertinent for weakness over distal arm muscles, as well as bilateral proximal and distal weakness of the lower extremities, diminished reflexes, T4 sensory level and autonomic dysfunction.

Results: Infectious and hypercoagulable work-up was negative. MRI of the cervical cord showed abnormal T2 signal in the anterior spinal cord, from C5 through T2. DWI showed increased signal, with matching low signal on ADC maps. Cervicocervical and spinal angiography was negative for vascular occlusion or arteriovenous malformation. Patient was started on high doses of methylprednisolone for 5 days. His strength improved. He was discharged on aspirin and with physical therapy.

Conclusion: Stress on the management of infarctions of the spinal cord in children, but data have been extrapolated from adult stroke and spinal cord infarction. The use of steroids most likely reduced the inflammation and spinal shock and has facilitated recovery. Therefore early diagnosis with a high index of suspicion should be done especially in children where it is easier to miss the diagnosis, due to the relatively smaller volume and cross-sectional area of the pediatric spinal cord, compared to the adult spinal cord.

26. Radiologic Spectrum of Corpus Callosum Infarctions: A Case Series

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Introduction: Corpus Callosum (CC) infarctions are uncommon. The low incidence relates to a rich vascular supply to the better and posterior cingulate gyri and the protective hemodynamic factors.

Patients: We present three patients with varying degrees of CC infarction in case series.

Results: Case 1: 59 year old male was found to have left sided hemiparesis following CABG. MRI showed diffusion restriction contralateral to the body of the CC, with severe atrophic narrowing of distal petros and cavernous ICA bilaterally on MRA. A double hamen was noted in the left ICA, raising concerns for a dissection. Case 2: 46 year old female presented with acute onset of decreased volitional speech output and bilateral lower extremity weakness. MRI revealed diffusion restriction in the superior aspect of the corpus callosum and frontal subcortical white matter bilaterally. CTA showed an aneurysm ACA arising from the left internal carotid artery, causing infarction of the left frontoparietal cortex. Case 3: 49 year old female with sickle cell trait presented with sudden onset of confusion. Diffusion restriction seen on the splenium of the corpus callosum on MRI. ECHO was remarkable for an enlarged right atrium with a thrombus and a patent foramen ovale.

Conclusion: The three cases together provide a unique insight suggesting the etiology. Embolic events affect the splenium, while arteriothrombosis affects genu and body. Better understanding of clinical and radiologic complexities can aid in the diagnosis and perhaps obviate the need for biopsy.

27. Is Your Brain Really Necessary: Combined Quantitative MRI and Quantitative MRS may Improve Early Diagnosis of Alzheimer’s Disease

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Introduction: Although reduction in brain volume can occur without significant cognitive impairment, recent ADNI studies validate reductions in hippocampal and amygdala volume as biomarkers for mild cognitive impairment (MCI) and Alzheimer’s disease (AD). Quantitative MRI (qMRI) has also been proposed as an AD/MCI biomarker. A combination of quantitative MRI and MRS could provide more robust AD diagnosis than either alone.

Patients and Methods: Quantitative MRI and 1H MRS were performed on 37 subjects (AD n = 5, MCI n = 2, Elderly Controls n = 20, Young Controls n = 10). Short echo time (TE) MRS marker N-acetylaspartate (NAA) and glial marker myo-inositol (mI) were measured as NAA/mI. Brain volumes were normalized to intracranial volume.

Results: Age and dementia progress, hippocampal volume (AD vs. Elderly, p = 0.012; Young vs. Elderly, p = 0.007), amygdala volume (AD vs. Elderly, p = 0.040) and glial marker myo-inositol were decreased in older subjects. When mean normalized volumes and mean MRS ratios for each group were compared against each other, NAA/mI total hippocampal volume (R² = 0.892, p < 0.01) and NAA/mI total amygdala volume (R² = 0.892, p < 0.01) showed both significantly increasing linear correlations.

Conclusion: Volume reductions of the hippocampus and amygdala both strongly correlate with MRS markers, possibly that as the brain shrinks, NAA decreases and mI increases. Thus, quantitative MRI and MRS, when combined apparently provide improved biomarkers over either alone to effectively aid in clinical MCI/AD diagnoses.

28. Hypoglycemic injury on MRI

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Introduction: We describe the neuroimaging findings in a MRI of a patient with hypoglycemic injury.

Patients (or Materials) and Methods: Case Report

Results: A 29 year old male patient with Type 1 Diabetes on Insulin, presented with 2 years of ataxia, peripheral neuropathy and cognitive impairment. He is known to have bipolar disorder and several suicide attempts. While under insulin overdose. Examination revealed repetitive motor behavior with frequent circling of his hands. MRI showed T1 hypointensities predominantly within the basal ganglia and to some extent in pulvinar and dentate nucleus. Susceptibility signals on gradient sequence in the basal ganglia suggested mineralization. Spectroscopy of Brain revealed decreased NAA over the basal ganglia bilaterally with mildly elevated choline suggesting neuronal loss with gliosis (figures in poster).

Discussion and Conclusion: Etiologies which could cause such hypointense T1 signals include Neurofibromatosis-1, parenteral nutrition, liver failure, ischemic insult, carbon monoxide poisoning, Wilson’s disease and various causes of basal ganglia calcification including hyperparathyroidism. In the appropriate clinical background, symmetric and severe involvement of brainstem might favor a diagnosis of hypoglycemia, which was confirmed in our patient.

References


29. Progressive Lytic Herpes Simplex Virus (HSV) Type I Encephalitis Despite Maximum Medical Therapy

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Introduction: Untreated Herpes simplex virus (HSV) type I encephalitis can have significant morbidity and mortality. We present a case of acute lytic herpes simplex HSV-1 encephalitis despite maximum medical therapy.

Patients (or Materials) and Methods: Case Report

Results: A 15 year old female was febrile with HSV-1 encephalitis presented with four days of altered personality, headaches, short-term memory loss, poor executive functioning, hyperactivity and hypersexuality. On presentation, she had a MRI brain which showed on T2/FLAIR and DWI, abnormal hypointensity in the bilateral mesial temporal lobes extending to the frontal lobes. Her LP was significant for W-820, P-73, G-72 and positive HSV-1 PCR. Intravenous acyclovir was started. A repeat MRI nine days after symptom onset continued to show progression. Decadron was then started because of mass effect. A repeat LP on day 15 showed improving, but still significant, pleocytosis (W-608, P-114, G-52).

Conclusion: HSV-1 PCR remained positive. Her dose of acyclovir was increased but she worsened clinically. Foscarnet was added for concern of acyclovir-resistant HSV. A repeat LP on day 16 finally returned negative for HSV-1 PCR. However, she developed severe labial swelling on the foscarnet, and it was stopped. She remained on acyclovir. A repeat MRI on day 37 was stable. She completed 5 weeks of IV acyclovir, got discharged and continued 3 more weeks as oral valacyclovir.

Conclusion: Fulminant HSV-1 encephalitis, as demonstrated by this case, can cause significant morbidity. MRI FLAIR and DWI are of value in guiding the management of the brain and can guide clinical decision making on the dose, duration, and type of antiviral used to treat.

30. MRI Evidence of Carotidynia- the Need for Re-Examination of this Clinical and Radiological Enigma

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Introduction: Idiopathic carotidynia has been previously described as a self-limiting neck pain syndrome featuring tenderness over the carotid bifurcation without structural abnormality. There have only been a few case reports with imaging evidence suggesting a local inflammatory perivascular process.

Patients (or Materials) and Methods: We describe a case of a 65 year old lady with a history of hypertension, hyperlipidemia, smoking and breast cancer post lumpectomy who presented with progressive neck and face pain of about 4 weeks duration. The patient was seen by a primary care physician who suspected cervical lymphadenopathy and ordered a contrast-enhanced MRI of the face, orbits and neck.

Results: There was no MRI evidence of lymphadenopathy. Deep pressure on the mark placed on the skin over the center of the neck pain, there was a thick, concentric ring of enhancing tissue around the right carotid artery at the level of the external carotid. There was no other evidence of narrowing or mass effect on adjacent structures. A neck MRI subsequently done showed some straightening of the ipsilateral proximal internal carotid artery, but there was no evidence of dissection or atherosclerotic disease.
The patient had repeat neck MRI imaging which showed resolution of the lesion when her symptoms subsided.

33. Rare Case of Multiple Myeloma Causing Preseptal Mass and Meningeal Involvement

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Introduction: The etiology for a preseptal mass other than orbital cellularity is extremely rare. Orbital and meningeval involvement in multiple myeloma is also infrequent. The following case report involves a 53-year-old male with diagnosed stage IV multiple myeloma that presented with diplopia and headache.

Patients (or Materials) and Methods: The patient was initially diagnosed one year prior with IgA lambda multiple myeloma with 80% plasma cells noted on bone marrow biopsy. Preseptal mass was first assumed to be infectious and treated with antibiotics with no remission.

Results: MRI of the brain revealed rare CNS involvement with diffuse leptomeningeal enhancement. CSF cytology with flow cytometry confirmed plasma cell tumor and biopsy of the left preseptal orbital mass indicated a dense lymphoplasmacytic infiltrate consistent with plasma cell tumor. The patient underwent intravenous chemotherapy and palliative radiation to left orbit. Patient expired one month after initial presentation of diplopia and headache.

Conclusion: In conclusion, multiple myeloma with meningeal and preseptal involvement is a rare finding. From a comprehensive review of other case reports it appears that there was a direct spread of plasma cells from a hematogenous spread to the CNS. Loss of CD56 may be a marker for extramedullary spread of multiple myeloma. Overall, orbital and CNS involvement of multiple myeloma carries a poor prognosis.

34. Post-partum Cerebral Venous Sinus Thrombosis: Iatrogenic, Hypercoagulable or Both? Paul Hansen, Jesse Lee

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Introduction: Cerebral venous sinus thrombosis (CVST) is a potentially devastating condition with early mortality up to 13%. Incidence during pregnancy or peripartum has been reported as high as 1 in 10,000. Epidural spinal anesthesia (ESA) was introduced as a rare cause of CVST.

Methods: We report a case of post-partum CVST and review the existing literature. We postulate the cause in this case was multifactorial, due to cerebrospinal fluid leak post-ESA and underlying coagulopathy.

Discussion: A 29-year-old woman presented with severe headache, nausea, and eight days following spontaneous vaginal delivery with ESA. Non-contrast head CT demonstrated bilateral subdural effusions and intraparenchymal hemorrhage. MR venogram revealed superior sagittal and left transverse sinus thrombosis. MRI lumbar spine showed a fluid collection at L4-L5, compatible with CVST. Laboratory evaluation included antiphospholipid antibodies, ES, ANA, protein C and S activity, prothrombin gene mutation, Factor V Leiden, and homocysteine; all normal except for low protein S activity. Protein S may be decreased in pregnancy; however, the low protein S activity is not centered at 9 months post-discharge, off anticoagulation.

Conclusion: In our patient, the CVST leak likely contributed significant risk for small vessel disease. Hypercoagulable state. Although CVST can be difficult to diagnose due to varied symptomatology, the diagnosis is important to consider due to potential morbidity and mortality. Non-invasive neuroimaging should be considered in cases of progressive headache in young females on OCPs, or in the ante- and postpartum periods.

35. Hereditary Diffuse Leukoencephalopathy with Axonal Spheroids (HDLS): Observational Scoring System for Brain MRI

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Introduction: Hereditary diffuse leukoencephalopathy with axonal spheroids (HDLS) is a rare brain disease with only 22 reports published. Inheritance is autosomal dominant and the genetic cause remains unknown. The structural hallmark is axonal spheroids in brain white matter.

Methods and Patients: 15 new patients from Germany, Norway, and the US underwent MRI. All 15 patients had HDLS diagnosed by brain biopsy/autopsy. Sagittal T1, axial T1/T2 weighted and FLAIR images were visually assessed for location and distribution of white matter lesions (WML), involvement of grey matter, and atrophy. A severity score (0–5) was calculated for each MRI based on a scale modified from Loos et al. AJNR 1994:15:1761.

Results: 12 of the 15 patients demonstrated focal, confluent WML. 1 had generalized WML, 2 had patchy WML, and all had bilateral, slightly asymmetric WML. All cases had frontal predominance of WML; all had central and subcortical involvement, and all displayed periventricular distribution. 14 had progressive disease course with an initial MRI mean score of 16.4 (range, 10–35.5). In 2 cases with longitudinal studies, 2 had slight progression (mean initial score, 20; mean follow up score, 25); 1 had stable disease (score 4). Corticospinal tracts were involved in late disease stages. There was no involvement of grey matter, brainstem or cerebellum.

Conclusion: MRI severity score may serve as a biomarker to define the natural history of HDLS and to evaluate response to future treatments. Recognition of the typical MRI pattern of HDLS might be helpful in the diagnostic workup.

36. Plasma Exchange as Therapy for HIV-Associated Myelitis

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Introduction: Active plasma exchange (PLEX) therapy is sometimes beneficial in autoimmune and paraneoplastic neurological syndromes. Here we report a case of Panarteritis Nodosa (PAN) with involvement of the central nervous system.
Introduction: Although HIV-associated infections can affect the spinal cord, HIV itself can cause myelitis. Because immunosuppressive therapy, which is considered treatment, has traditionally been supportive. We report a case of HIV-associated myelitis responsive to plasma exchange (PLEX) therapy.

Patients [or Materials] and Methods: Case report.
Results: While on HAART, a 47-year-old male with a 3-year history of HIV (CD4 count of 82 cells/mm³) presented with progressive weakness and numbness for one year, beginning in the lower extremities and spreading rostrally. Exam revealed mild bifacial weakness, quadruparesis with 2 to 4/5 strength in the upper extremities and 8/5 strength in the lower extremities with the exception of left EHL weakness. MRI of the neck in distal lower extremities and lateral arms, hyperreflexic throughout, and extensor planter plantar responses. MRI showed diffuse hyperintensity on T2 and fat-signal enhancement throughout the cervical cord, from the medulla to C7. LP showed 4 mg/dL WBC, 5 mg/dL RBC, 73 mg/dL glucose, 69 mg/dL protein, IgG index 0.85, CSF cytology, cultures, and viral were negative. Serum testing was negative for viral etiologies, ACE, and NM20 antibody. A malignancy workup was unrevealing. He received 14 g IV Solumedrol for 14 days without improvement and then started on PLEX 6 sessions with significant motor improvement.
Conclusion: This case highlights a potential role of PLEX in the treatment of HIV-associated myelitis.

37. Bálo’s Congenital Sclerosis Presenting as a Ring-enhancing Lesion in a HIV-infected Patient. Case Report
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Introduction: Bálo’s congenital sclerosis is a rare demyelinating disease characterized as rapidly progressive, monophasic, and often fatal. Recent literature suggests patients can have an asymptomatic course or even spontaneous remission. We report a case of an HIV-infected patient presenting with ring-enhancing lesion subsequently diagnosed as Bálo’s congenital sclerosis.
Patients [or Materials] and Methods: A previously healthy 29-year-old female presented with left-sided numbness and weakness that progressed gradually over 3 weeks. Examination showed normal mental status and cranial nerves, left-sided hemiparesis, and left-sided hyperreflexia.
Results: An extensive work-up included serum, cerebrospinal fluid (CSF), studies, and neuroimaging. HIV antibodies were negative and CD4 count was 755. CSF studies including bacterial, viral, and fungal cultures were negative. CSF showed an elevated IGG index. Initial MRI brain showed T2 hyperintensity with contrast enhancement in the right corona radiata measuring 0.9 × 0.5 cm. Repeat MRI brain 2 weeks later showed significant increase to 2.9 × 1.8 cm. Brain SPECT showed normal tracer distribution throughout. The patient underwent a stereotactic biopsy with final pathological findings consistent with an atypical demyelinating process and no evidence of infection or neoplasm. The patient was placed on high-dose corticosteroids with significant improvement in symptoms.
Conclusion: Clinical and radiographical manifestations of HIV known to cause ring-enhancing lesions are well documented and include lymphoma, toxoplasmosis, tuberculosis and cryptococcal infections. Our patient had a normal CD4 count and therefore was not necessarily at increased risk for these opportunistic disease processes. He had the characteristic concentric ring pattern on MRI and typical histopathological findings. His newly diagnosed HIV infection served as a diagnosis from his eventual diagnosis of Bálo’s congenital sclerosis.

38. Dynamic Causal Modeling of fMRI Data Reveals Disordered Cortico-Hippocampal-Striatal Interactions During Associative Learning in Schizophrenia
Patients Sunali Wadhera, Vaibhav Diwadkar
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Introduction: Hippocampal-dependent associative learning is subserved by functional interactions with frontal (Banyai et al 2011) and striatal regions. Impaired fronto-hippocampal striatal functional connectivity is a hallmark of schizophrenia-related pathophysiology. Several studies have assessed network interactions using appropriate analytical techniques. Here, we applied Dynamic Causal Modeling (DCM; Stephan et al 2010) to fMRI data collected during paired-associate learning (Diwadkar et al 2010).
Methods: fMRI (4.0T) was collected in patients (n = 9) and controls (n = 10; 18 ≤ age ≤ 32 yrs). Because DCM relies on Bayesian model selection (BMS) to identify the most appropriate generative model for the data relative to neurobiologically plausible competitors, 144 models were constructed by permuting connections between 6 brain regions. In addition to three primary regions, the supra-network included visual, inferior temporal, and parietal cortices. This set of 2,736 models (144 model × 19 subjects) was submitted to a second-level Random Effects Analyses for BMS. Inter group inferences were based on Bayesian averages of estimated network coupling (Penny et al 2010). All analyses were conducted in SPM5.
Results: BMS identified one winning model with an exceedance probability (pMRC) of 0.01% lower than its closest competitor. In this model, patients exhibited inhibition fronto-hippocampal coupling, but hyper-excitatory striatal hippocampal coupling.
Conclusion: These results demonstrate that DCM is sensitive to identifying reduced fronto-hippocampal coupling and compensatory increased fronto-striatal coupling during associative learning in schizophrenia. The application of DCM to fMRI data constitutes a substantive new advance in applying and ability of fMRI to identify the correlates of schizophrenia-related pathophysiology (Diwadkar, Wadhera et al In Press, Arch Gen Psychiatry).

Mark Mason, Patrick Reynolds
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Introduction: Intracranial ophthalmoplegia is a neurological finding which is characterized by an inability of the eye to deviate in the primary direction. This deficit is commonly associated with lesions affecting the medial longitudinal fasciculus, which is responsible for conveying motor innervation to extraocular muscles. Bilateral intracranial ophthalmoplegias associated with acute infarction are uncommonly described due to the bilateral blood supply to this region originating from both posterior cerebral arteries. However, in some cases anatomical variants have been observed in which perforating vessels from the posterior cerebral artery arise predominantly from one side to supply structures bilaterally. When a dominant thalamoperforator arises in such a fashion, it is known as an artery of Percheron.
In this report, we present a 79 year old patient with a history of metastatic prostate cancer, hypertension, hyperlipidemia, and diabetes mellitus who is referred with a chief complaint of acute onset diplopia. Physical exam reveals a complete left intracranial ophthalmoplegia as well as a partial right intracranial ophthalmoplegia. The left eye is exotropic, and the right has an inferior skew deviation. There are no other focal neurological deficits. Brain MRI showed bilateral infarctions of the dorsal midbrain and periaqueductal grey area. These findings suggest the presence of an aberrant midbrain vascular supply originating from a single posterior cerebral artery.

40. An Usual Case of Central Pontine Myelolysis: Is There a Causative Role of Vitamin B12 Deficiency? Ebru Erbaybat Altay, Christopher Newey, Aarti Sarwal, Erik Pioro
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Introduction: Central pontine myelolysis (CPM) is a demyelinating disorder that affects the pontine base and particularly occurs in chronic alcoholism, liver failure, and malnutrition. However, other etiologies are less described. We present a case of resolving CPM in a patient with history of gastric bypass and vitamin B12 deficiency.
Patients [or Materials] and Methods: chart review of a case report.
Results: 54 year-old female with a remote history of gastric bypass presented with proximal lower extremity weakness after a 4-week bout of upper respiratory symptoms. An inflammatory myopathy was suspected. An EMG did show mild to moderate myopathic motor unit potentials, but a muscle biopsy did not corroborate this. She was also found to have a vitamin B12 deficiency (177 pg/mL; normal 221–709 pg/mL). Her MMA level was 397 mmol/L (normal 79–376). Other laboratory workup revealed a normal metabolic panel, including sodium, but low albumin of 1.9 g/dL and protein of 4.1 g/dL, which were 2.4 g/dL and 5.8 g/dL, respectively. 42 days earlier. Her brain MRI showed acute to subacute CPM. She was placed on low-dose oral steroids for inflammatory myopathy and vitamin B12 supplementation with improvement to full motor strength five months after symptom onset. Nine months after symptom onset she returned to the hospital with flu-like illness. Her brain MRI at this time showed resolved CPM and normal B12 levels.
Conclusion: This case highlights reversible myelolysis occurring in a patient with vitamin B12 deficiency and suspected.

41. A Case of Polyarteritis Nodosa with Central Nervous System Involvement
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Background: Neurological symptoms as the only presentation of polyarteritis nodosa (PAN) are rare. To date, only a few such cases of PAN with ischemic infarcts and aneurysms have been reported. Here we report a case of polyarteritis nodosa involving both peripheral and central nervous system.
Case Presentation: A 77-year-old male presented with gradual onset of right facial droop, dysarthria, unsteady gait, right lower extremity weakness and urinary retention, which worsened to the extent of severe paraparesis over the period of six months. Multiple MRIs at over six month period revealed multiple areas of restricted diffusion and T2 hyperintensities both supra and infratentorially, involving grey as well as white matter, suggesting either a demyelinating disorder or multiple ischemic strokes. Initial treatment with IVIG and single high dose steroids did not improve patient’s condition. Thereafter, muscle, sural nerve, right frontal lobe biopsy were done. Therapy with corticosteroids was significant for polyarteritis nodosa and but the brain biopsy turned out to be indeterminate. Therapy with cyclophosphamide and prednisone resulted in significant clinical improvement in patient’s condition after a period of one month along with interval resolution of brain lesions.
Conclusions: CNS vasculitis often has nebulous neuroimaging features, and a diagnosis of vasculitis should be suspected when the MRI of the brain shows multiple ischemic infarcts not limited to specific arterial territories as well as T2 hyperintensities that are not consistent with diagnosis of any demyelinating disorders, either peripheral nerve or muscle biopsy can be useful as well. Better knowledge of these potential manifestations of vasculitis may facilitate more prompt diagnosis and treatment.

42. Central Pontine Myelolysis Associated with Hodgkin Lymphoma
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Introduction: There are a few cases of central pontine myelolysis associated with Hodgkin lymphoma. Most cases are associated with electrocardiographic abnormalities, malnutrition and alcoholism. The underlying mechanism in Hodgkin lymphoma is not well known.

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Patients (or Materials) and Methods: 16 year old girl presents with 4 weeks of non intentional weight loss (1 lb in 2 weeks), fever and night sweats along with balance difficulties. No vomiting. On exam found to have hepatosplenomegaly and cervical lymphadenopathy. Blood work revealed pancytopenia. Neurological exam remarkable for nasal speech, flat face unless asked to smile or close eyes. Cranial nerve exam within normal limits. Formal strength exam reveals weakness 4/5 in all groups except neck flexion and extension which were 3/5. Proximal strength in limbs worse than distal. Sensation intact to cold, vibration intact. Poor heel-knee touch, good finger touching. Poor finger tapping, poor sequential finger touching. Reflexes brisk in lower extremities with bilateral clonus and left upper extremity Babinski. Unable to perform tandem walk.

Results: MRI brain showed diffuse cerebral atrophy, and central pontine myelinolysis. No known sodium variations, however alteration in sodium concentration cannot be fully excluded especially if happened before admission. Rone narrow biopsy was nondiagnostic. Cerebral lymph node excision positive for Hodgkin lymphoma, nodular type

Conclusion: The cause of central pontine myelinolysis in this case is most likely posttransplant due to underlying Hodgkin lymphoma and/or associated nutritional deficiency.

43. Magnetic Resonance Spectroscopy (MRS) Markers of Carbon Monoxide (CO) Brain Damage
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Carbon monoxide (CO) exposure is a common cause of toxic brain damage, whereby effects range from transient neurological dysfunction through permanent dementia & headaches to coma and death. A spectrum of severity of magnetic resonance imaging (MRI) findings after CO damage, including global pallidus and white matter lesions, is well documented. Reports of MR spectroscopy (MRS) findings remain sparse. The authors have documented MRS findings in normal MRI studies, under circumstances of hypoxia or elevated parts per million (ppm) of CO and with subsequently abnormal cytochrome c oxidase (COX) arterial levels, whereby brain MRI has been normal but MRS was abnormal with decreased n-acetyl aspartate (NAA) levels in the basal ganglia either bilaterally or unilaterally.

44. Post Transplant Lymphoproliferative Disorder Masquerading as Posterior Reversible Encephalopathy Syndrome (PRES)
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Introduction: Purpose of this abstract is to report a fatal case of post-transplant lymphoproliferative disorder masquerading as posterior reversible encephalopathy syndrome (PRES). PRES is a clinical entity that is characterized by headaches, confusion, seizures, and/or visual impairment in the setting of acute hypertension. On non-contrast brain MRI, PRES has a typical pattern of vasogenic edema and T2/FLAIR hyperintensities with associated restricted diffusion in the affected areas (usually, bilateral parieto-occipital cortical and subcortical regions). Atypical MRI appearances may be noted but gadolinium enhancement, particularly, early in the disease course is distinctly unusual.

Patient (or materials) and Method/Case Report: A 55 year old male, 7-years post cadaveric renal transplant, presented with a two-week course of intermittent headaches, ataxia and cognitive impairment in the setting of acute renal insufficiency and malignant hypertension. Computed tomography (CT) of the head and non-contrast brain MRI revealed radioiodic features consistent with PRES. Despite optimal treatment, new onset fever with respiratory and cognitive decline ensued. Gadolinium-enhanced brain MRI revealed multiple ring-enhancing lesions and patient died 18 days post presentation with subfalcine herniation.

Results: A autopsy EBV positive polyclonal post-transplant lymphoproliferative disorder of the central nervous system was observed.

Conclusion: Our case of fatal lymphoproliferative disorder presenting as PRES on noncontrast brain MRI emphasizes the need for a heightened awareness of brain MRI. MRI with contrast can reveal unexpected brain lesions beyond the classical PRES and potentially alter the course of the disease.

45. The Appearance Of Flow on the Temporal Doppler Trace During Tilt, is a Predictor of Syncope
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Kathleen ZUJ,2 Kevin Shoemaker,3
Richard Hughson3
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Background and objective: In a study to identify an early hemodynamic marker of syncope, 12 men (25–40 y) underwent 30min of 80° head-up tilt, followed by progressive lower body negative pressure until presyncope.

Methods: Temporal arterial blood pressure (MAP), heart rate (HR), central venous pressure (CVP), arterial blood pressure (ABP), which were measured continuously using Doppler ultrasound. Ratios of the Doppler Vmean(VMCA/VVEM) and Vmax (VMCA/VVEM) were used to assess flow redistribution between these areas.

Result: The progression of the testing protocol showed increases in vascular resistance in all 3 men. A Pre-syncpe, both VMCA and VVEM were reduced while there was a large increase in TEMPV. The arterial vasomotor function during cerebral hypovolemia, resulting in the appearance of negative velocity deflections, which could be used for the early detection of impending syncope. Analysis of the velocity ratios showed little change until the onset of presyncope where there was an increase in VMCA/VVEM which confirmed that the vasoconstriction of the vascular bed supplied by the TEMP arteriole contributed to cardiac output redistribution in favour of the brain, and a reduction in VMCA/VVEM suggesting a redistribution of cardiac output towards the legs. In 67% of the tests the appearance of the negative component of VTEMP was an early sign of increasing TEMPV that occurred before visually detectable changes in VEM or VMCA and within 5 min before presyncope.

Conclusion: Such easily identifiable Doppler signs in real-time allow clinicians to anticipate test termination in 67% of the cases.

46. Neuromuscular Ultrasound May Prevent Intravenous Injury Associated with Biopsy of a Neck Mass
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Background and Purpose: Morbidity associated with blind biopsy of a palpable neck mass may be prevented by preprocedural neuromuscular ultrasound (US) evaluation. We present a case in which US was used after biopsy for diagnostic purposes and demonstrated the utility of US for imaging of the brachial plexus.

Methods: Case Report: A 64 year-old right handed female was evaluated for left lateral shoulder pain/paresthesia that developed after needle biopsy of a previously asymptomatic neck mass, thought to be a lymph node. Neurological examination showed mild left deltoid weakness, proximal left upper extremity weakness, and decreased pinprick sensation over the left lateral shoulder to the elbow.

Results: Based on our evaluation, the mass was concluded to be a benign peripheral nerve sheath tumor and did not require resection. The patient’s symptoms were caused by the biopsy of CS brachial plexus root, which could have been prevented with preprocedural imaging.

Conclusion: Neuromuscular ultrasound may be used successfully to characterize a neck mass – ideally prior to biopsy – improving patient outcomes and decreasing cost and morbidity associated with iatrogenic injury.
Introduction: Cerebrovascular resistance is a pressure dependent mechanism due to the cerebral autoregulation defined as the changes in arterial blood pressure. Our purpose was to assess the heritability (A), shared (C) and unshared (E) environmental components of middle cerebral artery (MCA) flow mean velocities (MFV) and pulsatility indexes (PI).

Patients (or Materials) and Methods: 76 Italian and American (90 monozygotic /MZ/ and 85 dizygotic /DZ/ twins pairs (mean age 53 ± 13 years) underwent transcranial Doppler sonography (MFV, PI, PI on left and right MCAs).

Results: Left and right MFV indicated 0.001 (95% CI, 0.000 to 0.287) and 0.107 (95% CI, 0.000 to 0.423), C was 0.724 (95% CI, 0.416 to 0.826) and 0.377 (95% CI, 0.204 to 0.548). C was 0.272 (95% CI, 0.201 to 0.382) and 0.317 (95% CI, 0.219 to 0.437). Heritability of left and right PI values indicated 0.000 (95% CI, 0.000 to 0.094) and 0.332 (95% CI, 0.201 to 0.463). C was 0.283 (95% CI, 0.105 to 0.459) and 0.411 (95% CI, 0.210 to 0.566), and E was 0.707 (95% CI, 0.550 to 0.889) and 0.540 (95% CI, 0.415 to 0.689), respectively.

Conclusion: No genetic but common environmental factors (familial socialization) seem to play a significant role on the onset of MCA MFV's. Environmental factors related to individual experience (e.g., smoking, diet, diabetes, physical activity) influence the PI's.

48. Cerebral Vasospasm Secondary to Intracerebral and Intraventricular Hemorrhage, 
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Coimbatore, Tamilnadu, India

Introduction: cerebral vasospasm is a well known complication of patients suffering from subarachnoid hemorrhage (SAH) vasospasm in the absence of SAH is rare. We present 3 patients who developed cerebrovascular ischemia secondary to vasospasm associated with intracerebral/IChu / intraventricular hemorrhage (IVH).

Patients (or Materials) and Methods: All the 3 patients were males aged 50, 58 & 64 years. Presented with acute onset of headache, vomiting & altered sensorium. One patient had a mild right hemiparesis. CT scan showed right thalamic hemorrhage in 2 patients & a left thalamo capsular hemorrhage in one patient. The CT angiogram/CTa) admission was normal in all the 3 patients. Despite a stable neurological status first week post admission, during the second week there was deterioration in the level of consciousness & focal motor deficits occurred in all in the three patients. MRI scan brain revealed multiple areas of infarcts in all the 3 patients. Trans cranial Doppler(TCD) examination revealed multiple areas of vasospasm in all the patients which was confirmed by CT angiogram. All the 3 patients improved with triple H therapy. Repeat TCD & CTA after a week showed complete resolution of vasospasm.

Conclusion: All had symptomatic cerebral vasospasm as a result of IChu and IVH in the absence of SAH. TCD helped in detecting the vasospasm. The cerebral vasospasm could be ruled out because of a high index of suspicion. Because of early intervention there was complete resolution of vasospasm.

Conclusion: These three cases show the importance of TCD examination, if clinically suspected, even in the absence of SAH, in patients with IChu & IVH to detect symptomatic vasospasm and to do early intervention.

49. Patients with Small Cerebral “Hypertensive” Lacunar Infarction in the Middle Carotid Artery 
Territory-MRI Data and TCD Sonographic Correlation 
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Introduction: The incidentally revealed lacunar hypertensive infarction, sometimes have no neurological symptoms corresponding to the localization of detected brain lesions. Is there a certain TCD changes – to predict this status in future – is the aim of this study. 

Patients (or Materials) and Methods: Patients with arterial hypertension, who had supratentorial (MCA territory) focal infarctions diagnosed on MRI have been examined on TCD (PI, MFV). All infarction foci were localized in the subcortical and periventricular white matter.

Measurements of Peak Systolic Velocity (PSV), End Diastolic Velocity (EDV) and Mean Flow Velocity(MFV), Gosling Pulsatility Index (PI) and Fournier Resistance Index (Re) of MCA in this group have been compared with identical TCD measurements of the control group hypertensive patients who had no abnormality on MRI. All the patients who had arteriosclerotic calcifications in the lumen of the subcortical or M1 portion of MCA excluded from the study.

Results: The mean PSV / EDV in patients with hypertensive infarction was 80–26 cm/s. Average RI was 0.5. Significant decrease of EDV (26cm/s) and higher RI has been found. There were no PI differences in both groups (50 and 55 cm/s).

Conclusion: Study shows significant differences of EDV and PI in patients with focal lacunar subcortical and periventricular infarctions in comparison of two hypertensive groups. The presence of poor collateral supply of periventricular white matter and periphery small vessels lumen vasospasm. Low EDV and high RI probably might be a useful diagnostic criteria to selection of the hypertensive patients for clinical TCD monitoring, as well as to determine groups with higher risk of cerebrovascular complications of the hypertensive disease based on the haemodynamic disturbances.

50. The Prevalence of Intracardiac Shunts and Vulnerable Carotid Plaqueing in Cryptogenic Strokes and TIA's 
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Methods: 918 patients between the ages of 15 and 85 years were referred by neurologists to the vascular lab between 2005 and 2010 with multiple cryptogenic TIA's and/or MRI confirmed areas of cerebral infarct. Tests performed included: carotid duplex examination looking specifically for plaque formations with morphologically ominous composition and right-to-left cardiac shunt detection using agitated saline injections and timed, gauged Valsalva maneuvers while monitoring a middle cerebral artery with transcranial Doppler and counting the number of microbubbles that pass through the targeted MCA.

Results: Vulnerable or morphologically ominous carotid plaqueing is age related peaking between the ages of 61 and 85 years. Large right-to-left cardiac shunts were age independent with equal occurrence over the entire age range.

Conclusion: Large right-to-left cardiac shunts are present in 20% of the 918 group equally spread among the age groups. In the patients over 35 years, vulnerable or morphologically ominous plaques are found 56% of the time in patients under 55 years. It is apparent that large right-to-left cardiac shunt in cryptogenic stroke and TIA patients has a distinct pathophysiology unrelated to arteriosclerotic disease.

51. Incidence of Congenital Vascular Malformations in Neonates: a Power Doppler Imaging Prospective Study 
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Introduction: Vascular malformations of the intracranial vessels are extremely rare developmental anomalies that can be isolated or associated with other malformations. They are frequently asymptomatic in neonates. Their exact incidence is unknown.

Patients (or Materials) and Methods: To assess incidence of vascular malformations in our population, power Doppler imaging was obtained in all neonates born during the same year with a free of congenital malformations.

Results: Four hundred eighty five neonates, who were born in the same year, underwent sonographic evaluation. The majority were premature infants with gestation age between 20 and 32 weeks. Five neonates had developmental anomalies of their intracranial vessels. The vascular malformations were asymptomatic in all patients. In one neonate with aneurysmal hypoplasia of the left ICA with reverse flow in the left ACA.

Conclusion: Congenital vascular malformations of the intracranial vessels are usually asymptomatic in neonate but may require close follow up. Their incidence is close to 1%.

52. A Clinical, Angiography and Transcranial Doppler Score for Predicting the Long Term Clinical Outcome in Aneurysmal Subarachnoid Hemorrhage 
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Introduction: To determine which baseline clinical, radiological and transcranial Doppler (TCD) parameters are predictive of clinical outcome after aneurysmal subarachnoid hemorrhage (SAH).

Materials and Methods: The patients were prospectively evaluated 138 SAH patients. CT Fisher grade, aneurysmal location in the first cerebral angiography, first set of TCD studies and clinical parameters on day of the TCD were included. The primary outcome was modified rank scale (mRS) score dichotomized into good (mRS ≤2) or poor (mRS ≥3) outcome. Univariate and multivariate logistic regression analysis (LRA) were performed.

Results: For angiography and TCD study were done at mean ± SD interval of 1.2 ± 2 and 3.7 ± 2.5 days, respectively, from SAH onset. At three months, 78 (56.5%) patients had a good and 60 (43.5%) had a poor outcome. By univariate analysis the following parameters were associated with a poor outcome: HH grade, motor or language deficits, GCS score ≤ 8 (p = 0.001) and basal TCD showing mean flow velocity (MFV) > 120 cm/sec in any vessel (p = 0.07 with trend). LRA showed that only motor or language deficits, GCS of ≤8, TCD MFV > 120 cm/sec and Fisher score of 4 were predictive of poor outcome. On a scoring scale of 1 to 5 with 1 point each for the above five variables, a higher score predicted an increased odds ratio (OR) for poor outcome (OR = 2 with score of 1 and 50 with score of 5).

Conclusion: In aneurysmal SAH, a scoring system based on the TCD results may predict the outcome. Further validation is suggested.

53. Relationship Between Site of Arterial Occlusion and NIHSS Score in Hyperacute Stroke: Analysis by Transcranial Doppler 
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Introduction: Angiographic studies have shown that National Institute of Health stroke scale score (NIHSS) is an inaccurate marker for predicting intracerebral occlusion and angiographic features TCD may be an alternative factor if there is a correlation between site of occlusion and...
NIHSS and a cutoff NIHSS which accurately predicts proximal occlusions (PO).

Patients (or Materials) and Methods: 374 patients from CLOTBUST data bank were included. PO included terminal internal carotid artery (TICA), M1 segment of middle cerebral artery (MCA) and basilar artery (BA) occlusions whereas distal occlusion (DO) included M2 MCA, anterior and posterior cerebral artery (ACA/ PCA) and vertebral artery (VA) occlusions. Univariate analysis (UA) was performed for individual sites of occlusion and for predictors of PO. Logistic regression analysis (LRA) was performed for prediction of NIHSS cutoff to predict PO.

Results: By UA, baseline NIHSS (n=NIHSS), thrombolysis in brain ischemia (TIBI) flow grade, degree of recanalization and modified Fisher scale (mFS) at 3 months were significantly different between the various sites of occlusion and NIHSS, TIBI flow grade and CT ASPECTS score differed significantly between PO and DO. LRA showed that NIHSS and TIBI flow grade (p < 0.001 each) differentiated PO from DO. The respective sensitivity, specificity, positive predictive value and negative predictive value of various NIHSS cutoffs to differentiate PO from DO were: 100%, 28.7%, 100%, for NIHSS ≥ 5; 93.8%, 80%, 72.1%, 68.2% for NIHSS ≥ 10; 72.8%, 50.8%, 78.3%, 52.5% for NIHSS ≥ 15. 33.8%, 83.2%, 80%, 38.7% for NIHSS ≥ 20 and 69.7%, 82.4%, 74.3% for NIHSS ≥ 25.

Conclusion: Although NIHSS are higher in PO, there is no satisfactory cutoff NIHSS which differentiates PO from DO.

54. Cross-Sectional Comparison of White Matter Tracts in Early and Later Multiple Sclerosis Using Tract-Based Spatial Statistics Eugene Wang, Rebecca Romero, Adil Javed University of Chicago Hospitals, Chicago, IL, USA

Introduction: Damage to white matter tracts occurs early in multiple sclerosis, even in areas that appear normal by conventional MRI imaging. Tractography using voxelwise analysis of multi subject diffusion data (TBSS) can be reliably used to detect global abnormalities in the white matter tracts before conventional MRI detection.

Patients (or Materials) and Methods: Subjects: Subjects: early RRMS (N = 6) was defined as those patients with disease onset ≤ 2 years and EDSS of ≤ 3.5. Later RRMS (N = 4) was defined as disease onset between 2–4 years and EDSS between 3–5.5. Traditional MRI in both groups showed less than 30% of disease burden. Age and sex matched controls with no history of inflammatory CNS disease were used as controls (N = 4).

Result: Using TBSS we have captured a significant amount of white matter tract damage in the early MS group compared to controls (p = 0.005). Remarkable areas of departure from mean FA values include the corpus callosum, cortical U fibers in the parietal and frontal cortex, thalamus and portions of the basal ganglia without evidence of demyelination. The amount of white matter tract damage is even more diffuse in the later MS group (p = 0.014), extending even to the brainstem and cerebellar white matter tracts.

Conclusion: Early detection of white matter damage using DTI MRI tractography is a powerful tool to assist physicians in tissue planning. The corpus callosum appears to be a strong marker for white matter tract damage, and appears to be affected even early in the disease course.

55. Mechanism of Acute Ischemic Stroke in Patients with Severe Intracranial Atherosclerotic Disease Jordan Dubow,1 Edward Greenberg,2 Alejandro Santillan,2 Mathew Fink,2 Athos Patsalides2

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Introduction: Intracranial atherosclerotic disease (ICAD) is one of the most common causes of ischemic stroke worldwide. Although the pathogenesis of cerebral infarction in ICAD has been reported from autopsy series, the mechanisms of ICAD are still not well known. This study utilized perfusion imaging and diffusion weighted imaging or computed tomography (CT) imaging to help identify the mechanisms of ICAD involving all major intracranial vessels.

Patients (or Materials) and Methods: We reviewed CT or MR perfusion studies and DWI or CT scans in 17 patients presenting with severe symptomatic ICAD. Perfusion scans were compared to stage of perfusion deficit and DWI or CT images were categorized by lesion pattern and location such as cortical or penetrating artery infarct. Perfusion findings and infarct patterns were compared in these patients to further elucidate the mechanism of ICAD.

Results: Fifteen patients had borderzone infarctions, either alone or in combination with cortical and/or penetrating artery infarcts. Infarcts were categorized into borderzone infarcts, both of which had ICAD in the posterior circulation. Of the 15 patients with borderzone infarctions, 5 had borderzone infarcts only and 10 had additional white matter infarcts, 5 had white matter infarcts only and 10 had borderzone and penetrating artery infarcts. Thirteen of the 15 patients with borderzone infarctions had perfusion deficits. None of the patients with non-borderzone infarcts had no perfusion deficit.

Conclusion: In patients with severe ICAD, the mechanism of stroke is due to a combination of homodynamic insufficiency, artery to artery emboli and penetrating artery occlusion. However, hemodynamic insufficiency plays a major role.

56. Identification of a Symptomatic Sural Schwannoma with High Frequency Ultrasound Seby John, Steven Shook Cleveland Clinic Foundation, Cleveland, OH, USA

Introduction: High frequency ultrasound (US) is a useful adjunct to electromyography (EMG) and can be used effectively in the evaluation of focal peripheral neuropathies, including the sural nerve.

Patients and Methods: A 55 year-old right-handed female was referred to the Neurology clinic for pain in the right ankle of 2 years duration which was attributed to Achilles tendinitis. Her initial examination was normal except for mild tenderness behind the right lateral malleolus. MRI of the ankle done previously was negative for musculoskeletal pathology. EMG was recommended but she refused. An US showed focal enlargement of the right sural nerve in the calf. The lesion was noncompressible, hypechoic, and tender to palpation, consistent with a neuroma. She opted for surgical resection and the biopsy was consistent with schwannoma. Apart from expected numbness, she had complete resolution of pain.

Results: Neuroimaging was a useful and dynamic adjunct to EMG in the evaluation of peripheral neuropathies. EMG with Nerve Conduction Study (NCS) remains the diagnostic gold standard for differentiating radiculopathy, plexopathy, neuropathy or myopathy; as it provides anatomic information and precise localization. When combined with electrodiagnostic tests for evaluation of mononeuropathy, studies have shown that imaging provides additional impacts management by providing valuable structural information. In addition, US can be used to localize a nerve lesion in order to focus a subsequent MRI, reducing scan time and cost.

Conclusion: Neuroimaging is complementary in the diagnosis of peripheral neuropathies, including nerve sheath tumors.

57. Bilateral ACA Stroke Secondary to Unilateral Hypoplasia of ACA: Report of Two Cases Sharon Tai University of Malaya, Kuala Lumpur, Malaysia

Introduction: Unilateral hypoplasia of anterior cerebral artery (ACA) is a rare congenital factor for this rare type of bilateral ACA stroke.

Patients (or Materials) and Methods: We are reporting two cases of bilateral ACA stroke in one woman with diabetes mellitus and hypertension who presented with acute onset of weakness of the right upper and lower limbs. On examination, she was obeying simple commands but was not able to talk. She had power of 3/5 on the right side with uggosing plantar. CT scan of brain showed acute infarcts in both frontal lobes. MRI diffusion weighted images showed restricted diffusion on DWI/ADC at both frontal lobes, left MCA and corpus callosum consistent with acute infarcts. MRA brain showed stenosis at intracranial segment of MCA and left ACA. RightACA was not visualised.

The second patient was a 57 year old man with hypertension who presented with acute myocardial infarct. During coronary angiography, he developed acute stroke with right hemiparesis. CT perfusion showed acute left MCA (50% matched defect) and acute bilateral ACA stroke (unmatched defect). CT showed occluded left ICA with left bitemporal ischemia.

Conclusion: We are presenting two rare but interesting cases of bilateral ACA stroke secondary to unilateral hypoplasia of ACA.

58. Self-Referral for MRI Imaging: A Comparison Between Neurologist Shareholders Versus Non-Shareholders in a Single Specialty Practice Sarah Bashir, John Choi, Patrick Capone Winchester Neurological Consultants, Winchester, Va, USA

Objective: To compare the frequency of diagnostic neuroimaging studies self-referred by neurologists who are shareholders in an outpatient MRI facility versus non-shareholders in a single specialty practice.

Method: In a retrospective statistical review of all patients referred to an outpatient MRI facility in a two year period (between 6/1/2009 to 6/1/2011) a total of 1416 patients were referred for MRI’s by the head and spine by the practice. The practice encompassed 2 shareholders and 4 non-shareholders in a single specialty practice. Neurology non-shareholders encountered 3894 patients and referred 338, neurology non-shareholders encountered 10272 and referred 1078 patients for diagnostic imaging. The frequency by which physician shareholders and non-shareholders referred patients for diagnostic imaging was calculated over the 2 year period. Comparisons were made using the chi square test.

Result: In the review of all patients referred to the diagnostic center, non-shareholder neurologists referred patients 1.6 times more often than shareholder neurologists with a chi square of 8.34. This difference was significant for neurology non-shareholder utilizing diagnostic imaging more frequently than shareholder neurologist.

Conclusion: Non-shareholder neurologists utilized imaging more frequently than shareholder neurologists. Importantly, the non-shareholder physicians received no benefit for patient referrals to the diagnostic center. There is no evidence for overutilization by physicians who are shareholders in this study. A possible explanation of differences between these two physician groups may include experience (shareholder physicians on average with more private practice experience) as well as training on part of the non-shareholder physicians. This study is ongoing with additional data collection.

59. Dural Arteriovenous Fistula with Embolisation Sharon Tai University of Malaya Medical Centre, Kuala Lumpur, Malaysia

Introduction: Early diagnosis and management of intracranial dural arteriovenous fistula (dAVF) can prevent the occurrence of stroke.

Patients (or Materials) and Methods: We are presenting an interesting case of dural arteriovenous fistula with embolisation done.

Result: The patient was a 56 year old man with who presented with an episode of right sided weakness and altered level of consciousness. He was referred to TMC for embolisation. CT and MRI showed an interesting case of dural arteriovenous fistula with embolisation done.

Conclusion: We are presenting an interesting case of right transverse sigmoid sinus dural arteriovenous fistula (grade three) with embolisation done.
60. Adult Choroid Plexus Carcinoma with Associated Li-Fraumeni Syndrome  
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Li-Fraumeni syndrome is an autosomal dominant, highly penetrant cancer predisposition syndrome with early onset of malignant tumor formation. First described in 1969 by Li and Fraumeni, it is characterized by five cancers: sarcoma, adrenocortical carcinoma, breast cancer, leukemia and brain tumors. The penetrance, as well as early age of onset, pertaining to p53 related carcinoma is relatively higher in women when compared to men. Choroid plexus tumors (CPTs) are intraventricular neoplasms of epithelial origin affecting mostly children. CPTs are subclassified as choroid plexus carcinoma (WHO grade 3), choroid plexus papilloma (WHO grade 1) and atypical choroid plexus papilloma (WHO grade 2).

We report a case of a forty-six year old Caucasian female with a history of Li-Fraumeni syndrome that developed disorientation and retroorbital head pain. She has a history of bilateral breast adenocarcinoma first diagnosed at the age of 24, with recurrence at age 37. Subsequent chemotherapy consisted of 5-FU, Cytoscan and methotrexate following mastectomy.

Initially thought to be sinusitis, an MRI brain revealed a large right intraventricular mass with diffuse vasogenic edema encompassing the right cerebral hemisphere with resulting mass effect and right to left shift. Our patient underwent partial surgical resection and has improved clinically. Postoperatively, she describes blurriness and gray colored distortion to her visual fields. Pathological specimen was consistent with the diagnosis of choroid plexus carcinoma. Repeat neuroaxis imaging revealed no indication for residual or recurrent tumor. Recommendations were made for PET scan to rule underlying primary neoplasm and chemotherapy regimen of carboplatin and etoposide.

61. Association of Soluble RAGE Levels with Carotid Atherosclerotic Plaque Characteristics by High-Resolution Ultrasound  
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Introduction: Recent cohort studies suggested serum levels RAGE (sRAGE) and its ligands are associated with the risk of cardiovascular disease. We hypothesized that sRAGE levels are associated with subclinical ultrasound measures of atherosclerosis in an ethnically diverse population.

Methods: Clinically stroke-free participants (n = 1102) in the multi-ethnic Northern Manhattan Study (NOMAS) underwent high-resolution carotid B-mode ultrasound to measure carotid plaque morphology (plaque density, thickness and area) and IMT. Plaque density was analyzed by Gray Scale Median (GSM) using automated M- mode software. Serum sRAGE was measured by ELISA and log-transformed to stabilize variance. Multiple linear and logistic regressions were employed to estimate sRAGE associations with IMT and plaque measures.

Results: The mean age was 64 yrs; 65% were Hispanic, 19% black, and 16% white. The majority of subjects had carotid plaque present [54%]. Mean IMT was 0.08 ± 0.09mm. sRAGE levels were inversely associated with carotid plaque echogenicity in Hispanics (GSM 44 ± 0.179), but not in blacks (GSM 52 ± 0.189) or whites (GSM 63 ± 0.190). No association was seen between sRAGE levels and carotid IMT, plaque area or plaque thickness. Further analysis in Hispanics demonstrated increased sRAGE levels to be associated with lower plaque density. Compared to bottom sRAGE quartile, those in the top quartile displaying a lower odds (0.43, 95% CI 0.22-0.83), after adjusting for sociodemographic and vascular risk factors.

Conclusion: In the present study, lower sRAGE levels were associated with increased plaque density amongst Hispanics subjects. These data suggest sRAGE levels may be useful in predicting atherosclerotic plaque morphology and its stabilization, especially amongst minority groups.

62. Decreased [11C]-Flumazenil Binding in Early Alzheimer Disease  
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Introduction. Neuronal loss in Alzheimer’s disease (AD), a better correlate of cognitive impairment than amyloid deposition, is currently gauged by the degree of regional atrophy. However, imaging markers, such as GABA-A receptor density, a marker of neuronal integrity, could be more sensitive. In postmortem hippocampus, GABA-A mRNA expression is reduced even in mild cognitive impairment. We measured whole-brain GABA-A binding potential in vivo using [11C]-flumazenil positron emission tomography (PET).

Methods. Twelve subjects, six patients with early Alzheimer’s disease and six healthy controls, were studied with [11C]-flumazenil PET, PET of metabolism and volumetric MRI. Data were evaluated with both voxel-based parametric methods and volume of interest (VOI) methods.

Results. In early AD, on voxel-based analysis [11C]-flumazenil binding was decreased in infero-medial temporal cortex, retrosplenial cortex and posterior periventricular regions. PET of metabolism and MRI volumetric analyses showed changes in regions affected in early AD, but, unlike with [11C]-flumazenil binding, the parametric findings failed to reach corrected significance in any region of the brain. On VOI analysis, the temporal and frontal lobes, as well as the cingulate gyrus showed decreased [11C]-flumazenil binding. Among the regions measured, hippocampal had the lowest binding potential. [11C]-flumazenil hippocampal binding potential correlated with memory performance.

Conclusion. [11C]-flumazenil binding was decreased precisely in the regions showing the greatest degree of neuronal loss in post-mortem studies of early AD. It could be a useful marker of neuronal loss in early AD and biloba should be studied in the preclinical stages of the disease.

63. A Randomized, Open, Placebo- and Active-Controlled, parallel, Phase I study in Single Center to Evaluate Cerebral Blood Flow After Administrations of Cilostazol and Ginkgo Biloba Extract Combination in Healthy Volunteers  
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Objectives: To evaluate cerebral blood flow after administrations of cilostazol and ginkgo biloba extract combination in healthy volunteers.

Methodology: 50 healthy male volunteer were enrolled a randomized, open, placebo- and active-controlled, parallel study. They randomly grouped as cilostazol-ginkgo biloba extract combination group (n = 20), cilostazol group (n = 10), ginkgo biloba extract group (n = 10), and placebo group (n = 10). We analyzed examination, brain SPECT, laboratory studies and adverse effect such as headache before and after medication.

Result and Discussion: Compared with pre-brain SPECR SPM, cilostazol-ginkgo biloba extract combination group showed significantly increased cerebral perfusion on posterior lobe of right cerebellum, middle frontal gyri of right frontal lobe, precuneus of right parietal lobe, middle frontal gyri of left frontal lobe, parietal lobule of left parietal lobe. Cilostazol group demonstrate increased cerebral blood flow on middle frontal gyri of left frontal lobe, ginkgo biloba extract group showed increased cerebral blood flow right parahippocampal gyrus and posterior lobe and vermis of left cerebellum. There was no change of cerebral blood flow on the placebo group. Cerebral blood flow trends to increase in cilostazol-ginkgo biloba extract group, ginkgo biloba extract group, cilostazol group, and placebo in order. Significant adverse effect was not observed in each group.

Conclusion: Healthy men who take cilostazol-ginkgo biloba extract combination showed increased cerebral blood flow in various brain areas. We suggest that this study would be preliminary result that cilostazol ginkgo biloba extract combination has clinical effect to cerebral ischemia.