DIAGNOSIS IN THE NEURAXIS SERIES

Jointly provided by Postgraduate Institute for Medicine and Penn Medicine Department of Radiology

AUGUST 13 – 15, 2021
Comprehensive Review of Clinical Neuroradiology

AUGUST 28-29, 2021
Advanced Imaging and Innovation in Neuroradiology

CREDITS
29.75 CME 15 SAM
The Penn Neuraxis course was designed to provide a concise, high-yield overview of topics most fundamental to the clinical practice of neuroradiology and board preparation. In this 3rd installment of Neuraxis, we expand on its foundation by offering additional in-depth coverage of ‘hot topics’ in neuroradiology, as well as practical exposure to advanced imaging techniques. This course provides “first-rate educational content” provided by a team of exceptional Penn clinical neuroradiology faculty and notable guest speakers. A systematic review of general neuroradiology, head and neck imaging, spine imaging, neurovascular anomalies/intervention, pediatric neuroradiology, neurodegenerative diseases, and practical nuclear imaging for the neuroradiologist will be accomplished through the delivery of more than 65 focused talks by 31 seasoned speakers. This comprehensive review of clinical neuroradiology will be covered in two modules:

**MODULE 1 (AUGUST 13-15)**

**Comprehensive Review of Clinical Neuroradiology**
This module is specially designed for practicing neuroradiologists, radiologists-in-training and those preparing for certifying and re-certifying examinations in neuroradiology. Over three days, we will provide a fast-paced, systematic, comprehensive review of all aspects of practical neuroradiology, modified to accommodate online learning in this pandemic era.

**MODULE 2 (AUGUST 28-29)**

**Advanced Imaging and Innovation in Neuroradiology**
Here, we will offer more in-depth exposure to several advanced topics in neuroradiology. The first day of advanced sessions includes practical ‘How-I-do-it’ workshops on DTI and fMRI post-processing and lectures on advanced perfusion techniques and novel radio-tracers and their neuro-oncologic applications. We will end the session with an expert panel reviewing ‘hard cases’ and sharing practical reporting tips. On day two, we will cover nuances in head and neck imaging, with a workshop on ‘perineural tumor spread,’ special sessions on neuro-ophthalmologic and skull base imaging, as well as image-guided interventions. We will end the day with an expert panel, reviewing ‘hard ENT cases’ and sharing practical tips on avoiding pitfalls in head and neck imaging.

**TARGET AUDIENCE**

This course is specially designed for practicing radiologists interested in refreshing their neuroradiology skills and radiologists-in-training preparing for certifying and re-certifying exams.

**COURSE OBJECTIVES**

**Upon completion of this activity, participants should be able to:**

- Review the practical neuroanatomy of the brain, head, neck, and spine
- Discuss the fundamentals of interpretation of adult and pediatric neuroimaging in the emergency department
- Summarize state-of-the-art concepts of acute stroke imaging and review common stroke mimics
- Recognize missed diagnoses and imaging pearls in the head and neck
- Discuss pertinent differential diagnoses of common neuro-radiologic disease processes
- Review important nuclear imaging techniques relevant to the practice of neuroradiology
- Extend your skills beyond image interpretation
FACULTY

HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA
All faculty are affiliated with the Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA

Suyash Mohan, MD
COURSE DIRECTOR
Associate Professor of Radiology & Neurosurgery

James Eric Schmitt, MD, PhD
ASSOCIATE COURSE DIRECTOR
Assistant Professor of Radiology & Psychiatry

Linda Bagley, MD
Associate Professor of Radiology & Neurosurgery

Michel Bilello, MD, PhD
Associate Professor of Radiology

Jan-Karl Burkhardt, MD
Assistant Professor of Neurosurgery

Sanjeev Chawla, PhD
Research Assistant Professor of Radiology

Alvand Hassankhani, MD
Assistant Professor of Clinical Radiology

Michael J. Hoch, MD
Assistant Professor of Clinical Radiology

Robert W. Hurst, MD
Professor of Radiology & Neurosurgery

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Assistant Professor of Clinical Radiology

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Assistant Professor of Clinical Radiology

Jane Lee, MD
Instructor

Laurie A. Loevner, MD
Professor of Radiology, Neurosurgery, and Ophthalmology
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Assistant Professor of Radiology

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Assistant Professor of Radiology & Neurosurgery

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Associate Professor of Clinical Radiology

Mary H. Scanlon, MD, FACP
Professor of Clinical Radiology

Jae W. Song, MD
Assistant Professor of Radiology

Joel M. Stein, MD, PhD
Assistant Professor of Radiology

Jeffrey B. Ware, MD
Assistant Professor of Radiology

Ronald L. Wolf, MD, PhD
Associate Professor of Radiology & Neurosurgery

John H. Woo, MD
Associate Professor of Radiology

CHILDREN’S HOSPITAL OF PHILADELPHIA

Erin Simon Schwartz, MD
Associate Professor of Radiology
Chief of Neuroradiology

Karuna Shekdar, MD
Assistant Professor of Clinical Radiology

Arastoo Vossough, MD, PhD
Associate Professor of Radiology

GUEST FACULTY

Frank Gaillard, MBBS, MMed, FRANZCR
Clinical Associate Professor in the Medicine, Dentistry and Health Sciences
University of Melbourne
Melbourne, Australia

Mary Maher, MD
Neuroradiology Fellow
Massachusetts General Hospital, Boston, MA
Joining Penn Medicine Radiology Faculty, July 2021

Alexander Mamourian, MD
Professor of Radiology, Neurosurgery, and Neurology
Penn State Hershey Medical Center
Emeritus Professor of Radiology, Penn Medicine
FRIDAY, AUGUST 13

9:15 Welcome & Course Overview
Suyash Mohan, MD & J. Eric Schmitt, MD, PhD

VASCULAR
9:30 Cerebrovascular Anatomy (Arterial and Venous) (CT, MR, XA)
Robert W. Hurst, MD
10:00 Cerebral Aneurysms: Concepts and Controversies (CT, MR, XA)
Linda J. Bagley, MD
10:30 Endovascular Management of Acute Stroke (XA, CT, MR)
Bryan A. Pukenas, MD
11:00 Imaging of Vasculopathies: RCVS, PRES, and Beyond (CT, MR, XA)
Jae W. Song, MD

11:30 Lunch Break

TRAUMA
12:30 Imaging of Head Trauma (CT, MR, NM)
Joel M. Stein, MD, PhD
12:50 Maxillo-Facial Trauma: Getting What Counts in Your Report (XR, CT, MR)
Suyash Mohan, MD
1:10 A Practical Guide to Acute Cervical Spine Trauma (XR, CT, MR)
J. Eric Schmitt, MD, PhD
1:30 Neuroimaging of Abusive Trauma (XR, CT, MR)
Karuna Shekdar, MD
1:50 Break/SAMs

SPINE
2:00 Pain in the Neck: Degenerative Disease of the Spine (CT, MR)
John H. Woo, MD
2:20 Imaging of the Postoperative Spine (CT, MR)
John H. Woo, MD
2:40 Non-Traumatic Spine Emergencies (XR, CT, MR)
Robert M. Kurtz, MD
3:00 Break/SAMs

NON-TRAUMATIC EMERGENCIES
3:10 Non-Traumatic Brain Emergencies (CT, MR)
Ronald L. Wolf, MD, PhD
3:30 Acute Neck: Infections and Inflammation (XR, CT, US, MR)
Karuna Shekdar, MD
3:50 Ischemic Stroke: An Approach to CT Stroke Protocol (CT, MR)
Frank Gaillard, MBBS, MMed, FRANZCR

4:10 LIVE Q&A Session

CASE REVIEW
4:30 LIVE It’s Always 5:00 Somewhere: Virtual Happy Hour BYOC (Bring Your Own Case)
5:30 Adjourn
## SCHEDULE

### SATURDAY, AUGUST 14

**9:15** Morning Warm-up

#### BRAIN I

**9:30** Infections of the CNS *(CT, MR)*  
Suyash Mohan, MD

**10:00** Imaging in Epilepsy: Making A Difference *(MR, NM)*  
Erin S. Schwartz, MD

**10:30** Toxic and Metabolic Encephalopathies: A Whirlwind Tour *(MR, CT)*  
Suyash Mohan, MD

**11:00** LIVE Ask Anything You Want from a Clinical Physicist *(MR)*  
Sanjeev Chawla, PhD  
Arastoo Vossough, MD, PhD  
Ronald L. Wolf, MD, PhD  
Jeffrey B. Ware, MD

**11:30** Artifacts Show-And-Tell *(CT, MR)*  
Alexander Mamourian, MD

**12:00** Lunch

#### BRAIN II

**1:00** Basics of Neurodegenerative Diseases *(CT, MR, NM)*  
Ilya M. Nasrallah, MD, PhD

**1:20** The Many Faces of Demyelinating Disorders: MS and Beyond! *(CT, MR)*  
Michel Bilello, MD, PhD

**1:40** Systemic Diseases and their Effects on the Brain *(CT, MR)*  
Ilya M. Nasrallah, MD, PhD

**2:00** Imaging of Hydrocephalus: Old Questions, New Answers *(CT, MR)*  
John H. Woo, MD

**2:20** Break/SAMs

#### NEOPLASM I

**2:30** A Systematic Approach to Adult Brain Tumors *(CT, MR)*  
Jeffrey B. Ware, MD

**3:00** Common Pediatric Brain Tumors *(CT, MR)*  
Erin S. Schwartz, MD

**3:30** Break/SAMs

#### NEOPLASM II

**3:40** An Overview of Spine Neoplasms *(CT, MR)*  
Karuna Shekdar, MD

**4:00** Brain Tumor Mimics *(CT, MR)*  
John H. Woo, MD

**4:20** Normal Variants: Don't Touch Lesions *(CT, MR)*  
Seyed Ali Nabavizadeh, MD

**4:40** LIVE Q&A Session

**5:00** LIVE Case Conference: Neuro Jeopardy! *(XR, CT, MR)*  
J. Eric Schmitt, MD, PhD

**6:00** Adjourn

### SUNDAY, AUGUST 15

**9:15** Morning Warm-up

#### ENT I

**9:30** Larynx and Hypopharynx: Anatomy and Pathology *(CT, MR)*  
Laurie A. Loevner, MD

**10:00** Imaging of the Salivary Glands *(CT, MR)*  
Mary H. Scanlon, MD

**10:30** Cystic Lesions of the Head and Neck *(CT, MR)*  
Deepak M. Sampathu, MD, PhD

**11:00** Temporal Bone Pathology *(CT, MR)*  
Arastoo Vossough, MD, PhD

**11:30** Lunch

#### ENT II

**12:30** Cervical Lymph Node Stations *(CT, MR)*  
Jillian W. Lazor, MD

**12:50** Imaging of the Temporomandibular Joint: Anatomy and Pathology *(CT, MR)*  
Deepak M. Sampathu, MD, PhD

**1:10** Paranasal Sinuses *(XR, CT, MR)*  
Piya V. Saraiya, MD

**1:30** Orbital Anatomy and Pathology *(CT, MR)*  
Mary Maher, MD

**1:50** Break/SAMs

#### PEDIATRICS

**2:00** Phakomatoses: A Survival Guide *(CT, MR)*  
Arastoo Vossough, MD, PhD

**2:30** Congenital CNS Anomalies *(US, MR)*  
Erin S. Schwartz, MD

**3:00** Pediatric White Matter Disorders *(CT, MR)*  
Arastoo Vossough, MD, PhD

**3:30** Break/SAMs

#### SKULL BASE

**3:40** Pituitary and Parasellar Pathology: Pearls and Pitfalls *(CT, MR)*  
Laurie A. Loevner, MD

**4:00** Pineal Region Imaging and Pathology *(MR)*  
Frank Gaillard, MBBS, MMed, FRANZCR

**4:20** LIVE Q&A Session

**4:40** LIVE Lightning Round: ABR-Style Board Review *(XR, CT, MR)*  
Suyash Mohan, MD  
J. Eric Schmitt, MD, PhD  
Robert M. Kurtz, MD

**5:20** Announcements

**5:30** Adjourn
**SCHEDULE**

### SATURDAY, AUGUST 28

#### ADVANCED I: Brain Tumors

- **7:45** Welcome & Course Overview
  - Suyash Mohan, MD
  - J. Eric Schmitt, MD, PhD

- **8:00** METHODOLOGICAL WORKSHOP: Practical Processing Pearls and Clinical Applications: DTI *(MR)*
  - Michael J. Hoch, MD

- **8:20** Treatment-Related Changes or Tumor Recurrence? *(CT, MR)*
  - Ronald L. Wolf, MD, PhD

- **8:40** Radiomics, Radiogenomics, and Machine Learning in Neuro-Oncology *(CT, MR)*
  - Joel M. Stein, MD, PhD

- **9:00** Molecular Highlights: Novel Radiotracers in Neuro-Oncology *(CT, MR)*
  - Seyed Ali Nabavizadeh, MD

- **9:20** METHODOLOGICAL WORKSHOP: Practical Processing Pearls and Clinical Applications: fMRI *(MR)*
  - Michael J. Hoch, MD

- **9:40** Break

#### ADVANCED II: Innovations

- **10:00** The ABCs of ASL *(MR)*
  - Vivek Patel, MD

- **10:20** A Night in Tunica: Fundamentals of Vessel Wall Imaging *(MR)*
  - Jae W. Song, MD

- **10:40** Rapid MRI for the COVID-Positive Patient *(MR)*
  - Michael J. Hoch, MD

- **11:00** Innovations in Neurointervention: Flow Diversions to Revascularization (and Beyond) *(CT, MR, XA)*
  - Jan-Karl Burkhardt, MD

- **11:20** Ischemic Stroke: CT Perfusion and MR Diffusion *(CT, MR)*
  - Frank Gaillard, MBBS, MMed, FRANZCR

- **11:50** Break

- **12:00** LIVE Neuro-Oncology Expert Panel and Q&A
  - Ronald L. Wolf, MD, PhD
  - Linda Bagley, MD
  - Suyash Mohan, MD

- **12:30** Adjourn

### SUNDAY, AUGUST 29

#### ADVANCED III: Neck

- **7:50** Announcements

- **8:00** Viral-Induced Neoplasia of the Head and Neck *(CT, MR, NM)*
  - Laurie A. Loevner, MD

- **8:20** Robotics in Head and Neck Surgery *(CT, MR)*
  - Laurie A. Loevner, MD

- **8:40** Imaging of the Brachial Plexus: A (mostly) Painless Review *(CT, MR)*
  - Alvand Hassankhani, MD

- **9:00** Blind Spots in the Head and Neck *(CT, MR)*
  - Laurie A. Loevner, MD

- **9:20** CASE-BASED WORKSHOP: Avoiding the Traps of Post-Operative Flaps *(CT, MR)*
  - Jillian W. Lazor, MD

- **9:40** Break

#### ADVANCED IV: ENT

- **10:00** CASE-BASED WORKSHOP: Detecting Perineural Spread Like a Pro! *(MR)*
  - Jane Lee, MD

- **10:20** Fire & Ice: Neuro-Ophthalmologic Imaging of NMO, MOG, and OMG! *(CT, MR)*
  - Mary Maher, MD

- **10:40** High-Resolution Imaging for Detection of CSF Leaks and Its Management *(CT, MR, XA)*
  - Bryan A. Pukenas, MD

- **11:00** ACR TI-RADS and Review of Thyroid and Parathyroid Imaging *(US, CT, MR, NM)*
  - Jillian W. Lazor, MD

- **11:20** Tag Team Imaging: PET/CT and PET/MR in Head and Neck Cancer *(CT, MR, NM)*
  - Laurie A. Loevner, MD

- **11:40** Break

- **11:50** LIVE ENT Tumor Board Expert Panel and Q&A
  - Laurie A. Loevner, MD
  - Mary H. Scanlon, MD
  - Deepak M. Sampathu, MD, PhD
  - Jillian W. Lazor, MD

- **12:20** Concluding Remarks

- **12:30** Adjourn
DISCLOSURE OF CONFLICTS OF INTEREST
Postgraduate Institute for Medicine (PIM) requires instructors, planners, managers and other individuals who are in a position to control the content of this activity to disclose any real or apparent conflict of interest (COI) they may have as related to the content of this activity. All identified COI are thoroughly vetted and resolved according to PIM policy. PIM is committed to providing its learners with high quality activities and related materials that promote improvements or quality in healthcare and not a specific proprietary business interest of a commercial interest.

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QUESTIONS?
Call: 215-662-6982 | Email: cme@rad.upenn.edu

CONTINUING MEDICAL EDUCATION
The Postgraduate Institute for Medicine designates this live activity for a maximum of 29.75 AMA PRA Category 1 Credit(s)™. Physicians should only claim the credit commensurate with the extent of their participation in the activity.

For Physician Assistants, the APPA accepts certification of participation from courses certified for AMA PRA Category 1 Credit(s)™ and organizations accredited by the AACME or recognized state medical society. PA’s may claim up to 29.75 AMA PRA Category 1 Credit(s)™ for completing this activity.

The credit breakdown by module is:

Module 1 (August 13-15): The total modality hours covered:
CT: 15 | MR: 18.25 | XR: 3.75 | NM: 1.0 | US: .75 | XA: 2.0

Module 2 (August 28-29): The total modality hours covered:
MR: 6.75 | CT: 4.25 | NM: 1.25 | XA: .75

SELF-ASSESSMENT MODULES (SAMS)
Participants in this activity will have an opportunity to earn 15 Self-Assessment credits (SAMs) by participating in the three-da Comprehensive Review of Clinical Neuroradiology module, (August 13-15). These modules meet the ABR’s criteria for a self-assessment activity in the ABR Maintenance of Certification program.

DISCLAIMER
Participants have an implied responsibility to use the newly acquired information to enhance patient outcomes and their own professional development. The information presented in this activity is not meant to serve as a guideline for patient management. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested in this activity should not be used by clinicians without evaluation of their patient’s conditions and possible contraindications and/or dangers in use, review of any applicable manufacturer’s product information, and comparison with recommendations of other authorities.
MEETING MATERIALS
Immediately following the meeting, participants will have access to view the lecture recordings for 30 days.

Virtual Attendee Hub: This course will be hosted via Cvent’s Virtual Attendee Hub. On the hub, attendees can:
- View the course agenda and access all virtual lectures
- Submit lecture questions in real-time using Live Q&A
- Access lecture recordings in an on-demand format for 30 days after the meeting ends
- Complete the course evaluation, session surveys, and claim AMA PRA Category 1 Credit(s)™.
- Access self-assessment modules (SAMs) and receive instant feedback for SAM credit.

CONFERENCE FEES (Feats listed in USD)

Physicians
Full Course: $475
Module 1 – Comprehensive Review of Clinical Neuroradiology: $375
Module 2 – Advanced Imaging and Innovation in Neuroradiology: $175

Resident/Fellows with letter of verification
Full Course: $175

ADDITIONAL DISCOUNTS
An additional discount of 10% off the Physician registration rate is available to those falling in one of the categories below. Registrations will be verified.

- Penn Radiology Alumni
- VA/DOD/Active Military
- Retired Physicians

Registrations are verified. Use code PENN10 (case sensitive) when prompted at check out.

COURSE CANCELLATION POLICY & TUITION REFUNDS
A full refund for the enrollment fee will be made upon receipt of a written request if received by 5:00 pm on Friday, August 6, 2021. Refunds will not be made after this date.

Penn Medicine’s Department of Radiology reserves the right to cancel or postpone any activity due to unforeseen circumstances. In the unlikely event of cancellation or postponement, Penn Radiology will refund registration fees but will not be responsible for related costs or expenses to participants.

CME CERTIFICATES
Certificates are issued electronically upon completion of the course evaluation. Attendees should download the certificate and save it for their personal records. Note: Attendees must complete the course evaluation and request their CME credits within 48 hours of the course end date.

REGISTRATION
Visit PennMedicine.org/RadiologyCME (Visa, Mastercard, Amex or Discover accepted.)

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- Retired Physicians

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REGISTER NOW

2021

- AUGUST 13-15 AND AUGUST 28-29 (VIRTUAL)
  Diagnosis in the Neuraxis: Comprehensive Review of Clinical Neuroradiology (two modules)

- OCTOBER 15-16 (VIRTUAL)
  Advanced TAVR, TMVR, and Beyond with Hands on Review of 50 Cases

- OCTOBER 21-23 (VIRTUAL)
  A Multimodality Imaging Approach to Women’s Health

2022

- JAN 9-12
  Breast Imaging at the Beach
  Four Seasons Resort Punta Mita | Riveria Nayarit, Mexico

- FEBRUARY 21-25
  Slope Side Imaging
  Westgate Park City Resort & Spa | Park City, Utah

- MARCH 6-9
  Radiology After Hours: Acute Diagnosis on Evenings and Weekends
  Fairmont Mayakoba | Riviera Maya, Mexico

- JUNE 27-JULY 1
  43rd Annual Diagnostic Imaging: Back to the Vineyard
  Harbor View Hotel | Edgartown, Massachusetts

- JULY 25-29
  Around the Clock Imaging
  Hotel Omni Mont-Royal | Montreal, Quebec, Canada