**Program Schedule**

**Wednesday, February 26, 2020**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>10:00 a.m.</td>
<td>Registration and Refreshments – Meeting Village</td>
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<tr>
<td>10:30 a.m.</td>
<td>Welcome, Course Objectives Goals and Introduction of</td>
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<tr>
<td></td>
<td>Bernard R. Bendok, M.D., Chair of Neurosurgery,</td>
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<td></td>
<td>Mayo Clinic in Arizona</td>
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<tr>
<td></td>
<td>Orland K. Boucher, P.A.-C.;</td>
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<td>Alexandra (Lexy) E. Richards, DNP, FNP-BC</td>
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<tr>
<td>10:45 a.m.</td>
<td>Virtual Reality Neuroanatomy Workshop</td>
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<td>Bernard R. Bendok, M.D.;</td>
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<td>Chandan Krishna, M.D.</td>
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<tr>
<td>11:25 a.m.</td>
<td>Brain Machine Interface: The Use of Machines to Maintain</td>
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<td>Neurological Function Interface of Neurogenic Degeneration</td>
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<td></td>
<td>or Profound Neurological Injury?</td>
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<td>Chandan Krishna, M.D.</td>
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<tr>
<td>11:35 a.m.</td>
<td>Important and Often Overlooked Safety Considerations in</td>
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<td>Awake Craniotomies</td>
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<td>Patrick B. Bolton, M.D.</td>
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<td>11:45 a.m.</td>
<td>Clear Point Improvement in Traditional Stereotactic Methodology in</td>
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<td></td>
<td>the Treatment of a Range of Neurological Diseases and Disorders</td>
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<td>JoDee A. Winter, P.A.-C., MSPAS</td>
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<tr>
<td>11:55 a.m.</td>
<td>Brainstem Cavernomas:</td>
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<td>Get This Raspberry Out of My Head</td>
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<td>Orland K. Boucher, P.A.-C.</td>
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<tr>
<td>12:05 p.m.</td>
<td>Emerging Technologies in Neuroscience</td>
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<td>Alexandra (Lexy) E. Richards, DNP, FNP-BC</td>
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</tbody>
</table>
Wednesday, February 26, 2020  *(APP Pre-Course Workshop continued)*

12:15 p.m  **Lunch**

12:45 p.m.  **Acute Care Management for Intracranial Hemorrhage with Specific Focus on Reversal Agents**  
Rudy Rahme, M.D.

12:55 p.m.  **Gene Therapy for Parkinson Disease Treatment**  
Joseph B. Farnsworth, P.A.-C.

1:05 p.m.  **Neurosurgical Approaches to Epilepsy Management (Vagus Nerve Stimulator, Strip, Depth, Grid Electrodes Placement, and Responsive Neurostimulation)**  
Richard S. Zimmerman, M.D.

1:15 p.m.  **Beyond the Brain and Spinal Cord: Peripheral Nerve Surgery**  
Pelagia E. Kouloumeris, M.D.

1:25 p.m.  **Neuroanatomy with Imaging Correlation: Spine and Brain**  
Kara L. Curley, P.A.-C.

1:35 p.m.  **Spine Malignancies and the Neurosurgical Role in Their Treatment**  
Maziyar A. Kalani, M.D.

1:45 p.m.  **Artificial Discs Implantation to Treat Cervical Spine Disease**  
Maziyar A. Kalani, M.D.

1:55 p.m.  **Adolescent Idiopathic Scoliosis**  
Jamal McClendon, Jr., M.D.

2:05 p.m.  **The Role of Neuro Monitoring in Acute Neurological Disease**  
Sara M. Batson, CNIM R. EEG / EP T. CLTM

2:15 p.m.  **Pain Management 101 for Spine Patients**  
Christopher H. Bailey, M.D.

2:25 p.m.  **Stress Management and Practical Techniques to Quench the Flames of Burn Out**  
Maria D. Mangione, Psy.D.

2:35 p.m.  **Question and Answer**  
Session Faculty
Wednesday, February 26, 2020  (APP Pre-Course Workshop continued)

3:00 p.m.  Move to Workshop

3:10 p.m.  Hands-on Workshop Section
            3 Stations – 20 minutes each rotation
            Cranial Plating/ Crainal Remodeling
            Kara L. Curley, P.A.-C.
            Alexandra (Lexy) E. Richards, DNP, FNP-BC
            Suturing Workshop
            JoDee A. Winter, P.A.-C., MSPAS
            External Ventricular Device Placement
            Pelagia E. Koulouumberis, M.D.;
            Joseph B. Farnsworth, P.A.-C.

4:10 p.m.  Move to General Session Room

4:20 p.m.  Living with a Movement Disorder and How
            Deep Brain Stimulation (DBS) Makes a Difference
            Shyamal H. Mehta, M.D., Ph.D.

5:00 p.m.  Advanced Practice Provider Workshop Adjourn

6:00 p.m. -  7:00 p.m.  3rd Annual Mayo Clinic Advances & Innovations in
            Complex Neuroscience Patient Care: Brain & Spine
            Course Welcome Reception and Early Registration –
            Meeting Village
# 3rd Annual Mayo Clinic Advances and Innovations in Complex Neuroscience Patient Care: Brain and Spine 2020

## Program Schedule

### Wednesday, February 26, 2020

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>1:00 p.m.</td>
<td><strong>Hands-on Bypass Workshop - Session I</strong> <em>(Separate Registration Required)</em>&lt;br&gt;</td>
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<td>Nora J. Schaefer, R.N., C.N.R.N.; Vanesa K. Vanderhye, M.S.N., R.N.</td>
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<tr>
<td>3:00 p.m.</td>
<td>Session I Adjourn</td>
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<tr>
<td>3:30 p.m.</td>
<td><strong>Hands-on Bypass Workshop - Session II</strong> <em>(Separate Registration Required)</em>&lt;br&gt;</td>
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<td></td>
<td>Nora J. Schaefer, R.N., C.N.R.N.; Vanesa K. Vanderhye, M.S.N., R.N.</td>
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<tr>
<td>5:30 p.m.</td>
<td>Session II Adjourn</td>
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<tr>
<td>6:00 p.m.-7:00 p.m.</td>
<td><strong>3rd Annual Mayo Clinic Advances &amp; Innovations in Complex Neuroscience Patient Care: Brain &amp; Spine</strong>&lt;br&gt;</td>
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<td></td>
<td>Course Welcome Reception and Early Registration – Meeting Village</td>
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</table>
3rd Annual Mayo Clinic Advances and Innovations in Complex Neuroscience Patient Care: Brain and Spine 2020

Program Schedule

Thursday, February 27, 2020

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 6:15 a.m. | Registration – Meeting Village  
Continental Breakfast and Exhibits                                |
| 7:00 a.m. | Welcome and Daily Course Objectives and Goals  
Bernard R. Bendok, M.D.                                         |

Session 1: Innovations in Peripheral Nerve Surgery

**MODERATORS:** Pelagia E. Kouloumeris, M.D.; Robert J. Spinner, M.D.;  
Joseph B. Farnsworth, P.A.-C.

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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| 7:15 a.m. | Peripheral Nerve Tumors  
Robert J. Spinner, M.D.                                           |
| 7:25 a.m. | Peripheral Nerve Injuries  
Shelley S. Noland, M.D.                                               |
| 7:35 a.m. | Entrapment Neuropathies  
Pelagia E. Kouloumeris, M.D.                                         |
| 7:45 a.m. | Electrophysiology and Neuromonitoring during Peripheral Nerve Surgery  
Iryna M. Muzyka, M.D.                                                 |
| 7:55 a.m. | Peripheral Nerve Diseases: Challenging Cases and Panel Discussion  
Alejandro Zavala, M.D.                                                |

Session 2: Movement Disorders

**MODERATORS:** Mark K. Lyons, M.D.; Shyamal H. Mehta, M.D., Ph.D.;  
Kara L. Curley, P.A.-C.

<table>
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<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 8:15 a.m. | Movement Disorders Innovations  
Shyamal H. Mehta, M.D., Ph.D.                                       |
| 8:25 a.m. | Deep Brain Stimulation (DBS)  
Mark K. Lyons, M.D.                                                   |
| 8:35 a.m. | Session Case Based Panel Discussion  
Session Faculty                                                         |
| 8:55 a.m. | Refreshment Break and Exhibits                                         |
Session 3: Innovation in Spine Management

MODERATORS: Maziyar A. Kalani, M.D.; Chandan Krishna, M.D.; Orland K. Boucher, P.A.-C.

9:25 a.m. Approaches to Avoid Surgery and Optimize Outcomes When Surgery is Needed
Arthur (Jason) De Luigi, D.O., M.H.A.

9:35 a.m. Interventional Options for Back Pain
John A. Freeman, D.O.

9:45 a.m. Neuromonitoring for Spinal Surgery
Iryna M. Muzyka, M.D.

9:55 a.m. Minimally Invasive Approaches for the Cervical Spine
Maziyar A. Kalani, M.D.

10:05 a.m. Minimally Invasive Approaches for the Lumbar Spine
Chandan Krishna, M.D.

10:15 a.m. Minimally Invasive Approaches for the Thoracic Spine
Pelagia E. Kouloumberis, M.D.

10:25 a.m. Artificial Disc and Novel Technologies for Spine Management
Maziyar A. Kalani, M.D.

10:35 a.m. Chronic Pain Management for Patients with Spinal Diseases
Cynthia O. Townsend, Ph.D., L.P.

10:45 a.m. Session Case Based Panel Discussion
Session Faculty

11:05 a.m. Lunch and Learn Special Presentation
(20 minutes Lunch/60 minute Presentation)

MODERATORS: Jamal McClendon, Jr., M.D.; Orland K. Boucher, P.A.-C.

11:25 a.m. State of the Art Complex Spinal Reconstructive Surgery

12:25 p.m. General Session Adjourn
Embolectomy and Intracranial Stenting Workshop – Accredited *(Separate Registration Required)*

**FACULTY:**
Bernard R. Bendok, M.D.; Chandan Krishna, M.D.;
Devi P. Patra, M.B.B.S.; Rudy Rahme, M.D.;
JoDee A. Winter, P.A.-C., MSPAS;
Jonathan J. Wood

12:45 p.m. **Embolectomy**

2:30 p.m. **Intracranial Stenting**

4:00 p.m. **Workshop Adjourn**

**COURSE DINNER AND SPECIAL PRESENTATION**

6:30 p.m. **Reception**

7:00 p.m. **Faculty Dinner and Special Presentation**
*Registrants Invited* *(Registration required - guests are an additional fee.)*

**My Innovation Journey**
Walter Stummer, M.D., Ph.D.
Director of the Department of Neurosurgery of the
University Hospital Münster
Münster, North Rhine-Westphalia, Germany

8:30 p.m. **Adjourn**
**Friday, February 28, 2020**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>6:30 a.m.</td>
<td>Continental Breakfast and Exhibits</td>
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<tr>
<td>6:45 a.m.</td>
<td>Daily Course Objectives and Goals</td>
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<td></td>
<td>Bernard R. Bendok, M.D.</td>
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<tr>
<td><strong>Session 4: Ischemic Stroke</strong></td>
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<tr>
<td>MODERATORS</td>
<td>Chandan Krishna, M.D.; Kara A. Sands, M.D.; Vanesa K. Vanderhye, M.S.N., R.N.; JoDee A. Winter, P.A.-C., MSPAS</td>
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<tr>
<td>7:00 a.m.</td>
<td>Telemedicine for Acute Stroke</td>
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<td>Bart M. Demaerschalk, M.D.</td>
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<td>7:10 a.m.</td>
<td>IV TPA for Stroke</td>
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<td>Kara A. Sands, M.D.</td>
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<td>7:20 a.m.</td>
<td>Embolectomy for Acute Stroke</td>
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<td>Chandan Krishna, M.D.</td>
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<td>7:30 a.m.</td>
<td>Moyamoya Disease</td>
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<td>Devi P. Patra, M.B.B.S.</td>
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<td>7:40 a.m.</td>
<td>Carotid Stenosis</td>
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<td>Chandan Krishna, M.D.</td>
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<td>7:50 a.m.</td>
<td>ICP Management and Craniectomy</td>
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<td>Ayan Sen, M.D.</td>
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<td>8:00 a.m.</td>
<td>Session Case Based Panel Discussion</td>
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<td>Session Faculty</td>
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<td><strong>Session 5: Brain Hemorrhage</strong></td>
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<td>MODERATORS</td>
<td>Bernard R. Bendok, M.D., Patrick B. Bolton, M.D.</td>
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<td>Alexandra (Lexy) E. Richards, DNP, FNP-BC; Ayan Sen, M.D.; Vanesa K. Vanderhye, M.S.N., R.N.</td>
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<td>8:20 a.m.</td>
<td>Brain Hemorrhage Triage and Reversal</td>
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<td>Ayan Sen, M.D.</td>
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<td>8:35 a.m.</td>
<td>Minimally Invasive ICH Evacuation and MRI Guided Therapies</td>
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<td>Chandan Krishna, M.D.</td>
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<td>8:45 a.m.</td>
<td>Subarachnoid Hemorrhage (SAH)</td>
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<td>Ayan Sen, M.D.</td>
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<td>8:55 a.m.</td>
<td>Complex Aneurysm Management</td>
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<td></td>
<td>Bernard R. Bendok, M.D.</td>
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</table>
Session 5: Brain Hemorrhage (continued)

9:10 a.m. Dural Fistula Management
Rabih Tawk, M.D.

9:20 a.m. Brain Cavernoma
Chandan Krishna, M.D.

9:30 a.m. AVM Radiosurgery
Ramiro Del Valle, M.D.

9:40 a.m. Brain AVM Management
Bernard R. Bendok, M.D.

9:50 a.m. Session Case Based Panel Discussion
Session Faculty

10:10 a.m. Refreshment Break and Exhibits

Session 6: Innovations in Epilepsy Surgery

MODERATORS: Joseph I. Sirven, M.D.; JoDee A. Winter, P.A.-C., MSPAS

10:40 a.m. What Do I Do Now: The Drug Resistant Adult Patient with Seizures and a Nonlesional MRI
Amy Z. Crepeau, M.D.

10:50 a.m. What Do I Do Now: The Drug Resistant Adult Patient with Seizures with Complex Lesional Epilepsy
Katherine H. Noe, M.D., Ph.D.

11:00 a.m. Acute Seizure Emergencies: New Approaches
Joseph I. Sirven, M.D.

11:10 a.m. Which Device Do I Choose from for Drug Resistant Epilepsy (VNS versus RNS versus DBS)
Richard S. Zimmerman, M.D.

11:20 a.m. What Do I Do Now: The Drug Resistant Child Patient with Focal Seizures
David Adelson, M.D.

11:30 a.m. Session Case Based Panel Discussion
Session Faculty
Friday, February 28, 2020 (continued)

11:50 a.m. Lunch and Learn Special Presentation  
(20 minutes Lunch/60 minutes Presentation)

12:10 p.m. Beyond White Light Fluorescence in Neurosurgery  
Walter Stummer, M.D., Ph.D.  
Director of the Department of Neurosurgery of the  
University Hospital Münster  
Münster, North Rhine-Westphalia, Germany

1:10 p.m. General Session Adjourn

Image Guided Surgery Workshop (Separate Registration Required)  
Non-Accredited (25 minute sessions)  
JoDee A. Winter, P.A.-C., MSPAS

1:15 p.m. Image Guidance  
Bernard R. Bendok, M.D.; Chandan Krishna, M.D.;  
Rudy Rahme, M.D.; Devi P. Patra, M.B.B.S.;  
JoDee A. Winter, P.A.-C., MSPAS

1:40 p.m. Fluorescence  
Bernard R. Bendok, M.D.; Chandan Krishna, M.D.;  
Walter Stummer, M.D., Ph.D.

2:05 p.m. Virtual and Augmented Reality  
Bernard R. Bendok, M.D.; Chandan Krishna, M.D.;  
Walter Stummer, M.D., Ph.D.

2:30 p.m. Robotics and Spinal Surgery  
Bernard R. Bendok, M.D.; Chandan Krishna, M.D.;  
Devi P. Patra, M.B.B.S.; Rudy Rahme, M.D.;  
JoDee A. Winter, P.A.-C., MSPAS

3:55 p.m. Question and Answer Session  
Session Faculty

4:15 p.m. Workshop Adjourn
Saturday, February 29, 2020

6:15 a.m.  Continental Breakfast and Exhibits

6:50 a.m.  Daily Course Objectives and Goals
Bernard R. Bendok, M.D.

Session 7: Spine Oncology

MODERATORS: Maziyar A. Kalani, M.D.; Maciej M. Mrugala, M.D., Ph.D.; Alyx B. Porter, M.D.; Sujay Vora, M.D.; Alexandra (Lexy) E. Richards, DNP, FNP-BC

7:00 a.m.  Epidemiology and Neurological Manifestations in Spine Oncology
Alyx B. Porter, M.D.

7:10 a.m.  Surgical and Minimally Invasive Options in Spine Oncology
Maziyar A. Kalani, M.D.

7:20 a.m.  Radiosurgery for Spine Oncology
Sujay Vora, M.D.

7:30 a.m.  Proton Beam for Spinal Oncology
Sameer R. Keole, M.D.

7:40 a.m.  Session Case Based Panel Discussion
Session Faculty

Session 8: Skull Base Tumors


8:00 a.m.  Medical Workup and Management of Pituitary Tumors
Michael D. Whitaker, M.D.

8:10 a.m.  Neuro-Ophthalmology Management of Pituitary Tumors
Maria Acierio, M.D.

8:20 a.m.  Endoscopic Approaches to Sellar Tumors
Michael Marino, M.D.

8:30 a.m.  Surgical Management of Pituitary Tumors
Bernard R. Bendok, M.D.
Session 8: Skull Base Tumors (continued)

8:40 a.m. Genetics of Skull Base Tumors
Radhika Dhamija, M.B.B.S.

8:50 a.m. Audiology of Vestibular Schwannomas
Sarah Oakley Holbert, C.C.C.-A

9:00 a.m. Vestibular Schwannomas: ENT Perspective
Peter A. Weisskopf, M.D.

9:10 a.m. Vestibular Schwannomas: Neurosurgery Perspective
Bernard R. Bendok, M.D.

9:20 a.m. Radio Surgery for Acoustical Neuromas
Sujay Vora, M.D.

9:30 a.m. Modern Management of Skull Base Chordomas
Sameer R. Keole, M.D.

9:40 a.m. Modern Management of Meningiomas
Walter Stummer, M.D., Ph.D.

10:00 a.m. Expanded Endoscopic Approaches for the Skull Base Diseases
Devyni Lal, M.D.

10:10 a.m. Neuromonitoring During Skull Base Surgery
Iryna M. Muzyka, M.D.

10:20 a.m. Session Case Based Panel Discussion
Session Faculty

10:40 a.m. Refreshment Break and Exhibits

Session 9: Gliomas

MODERATORS: Maciej M. Mrugala, M.D., Ph.D.; Alyx B. Porter, M.D.; Alejandro Zavala, M.D.; Allyson E. Hamacher, P.A.-C.;

11:10 a.m. Glioma Imaging
Leland S. Hu, M.D.

11:20 a.m. Neurologic Mimics of Brain Tumors
Marie F. Grill, M.D.
Saturday, February 29, 2020 (continued)

Session 9: Gliomas (continued)

11:30 a.m.       Glioma Surgery
                 Chandan Krishna, M.D.

11:40 a.m.       Laser Ablation for Recurrent Glioma
                 Richard S. Zimmerman, M.D.

11:50 a.m.       Glioma Radiation
                 Sujay Vora, M.D.

12:00 p.m.       Glioma Chemotherapy
                 Alyx B. Porter, M.D.

12:10 p.m.       The Promise of Immunotherapy
                 Maciej M. Mrugala, M.D., Ph.D.

12:20 p.m.       Session Case Based Panel Discussion
                 Session Faculty

1:00 p.m.        Course Adjourn