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# Foundations in Neurological Surgery

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# Foundations in Neurological Surgery

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Continuously searching for ways to improve resident education, Dr. Ashwini Sharan has begun a series of classes for residents. Each class is a one-day session focused on a specific set of techniques that the resident will need competency in. Using a traditional class format means that each resident is not only drilled on specific skills, but also gets to learn from his fellow students — and future colleagues — by observing them perform the same tasks. The Congress of Neurological Surgeons conference has similar workshops where practicing neurosurgeons can get familiarity with new tools. These classes are intended to ensure that residents enter the OR with a solid foundation of basic skills.

The first class was conducted with support from Stryker, a medical technology firm which is interested in staging similar courses at universities around the country.

This pilot class focused on Emergency Neurological Surgery. As important as forethought and planning are in surgery, speed is even more so. The resident should strive to develop automatic, accurate decision-making skills in order to conserve precious time. In this class, Dr. Sharan walked the residents through the thought processes that would have to become reflexive.

The residents were presented with a hypothetical patient (see inset), with a medical history and set of exam results. In the oral neurosurgical boards, the examinee receives such a scenario and must present justifiable clinical decisions without hesitation, confusion or ambiguity. In this class, the junior residents listened as Dr. Sharan led them through the reasoning process. First, he reviewed the Glasgow Coma Scale, which rates the patient on eye, verbal and motor responses in order to assess the severity of a coma. He then reviewed the signs, dangers and treatment of increased intracranial pressure.

After another lecture, this one on positioning of the patient, the hands-on sessions began. Dr. Sharan gave a lecture on a topic — power drills, dural closure, or rigid fixation — and the residents practiced with anatomical models or other analogues such as a beef scapula. For the practicum on patient positioning, the demonstration models were senior residents who bore their duties with good humor.

The class is one of a series Dr. Sharan plans to hold. Projected topics are spine surgery and placement of central lines. These courses will be planned in collaboration with medical device companies and will also take advantage of educational resources available at Thomas Jefferson University such as the simulation classrooms.

<b>64 year-old female</b>	Hx right frontal ICH No residual weakness AA 325, CMD for Afib Sudden onset 30 min.
<b>Exam</b>	Somnolent Anisocoria O x 1 Dysarthric FCs left intermittently

“One of our interns made it into the OR to make burr holes on Monday (following the Saturday course) — I spoke with the attending and he gave him an A-. Not bad for his first time in the OR. I really think placing a drill into his hand in a lab will have made all the difference.”

– Dr. Ashwini Sharan



**Educational Objectives**

Upon completion of this course, the physician should be able to:

1. Discuss the care of the emergency neurological surgical patient.
2. Determine appropriate body positioning and surgical approaches required for access to multiple lobes of the brain.
3. Describe the appropriate application of current and innovative technologies and instrumentation to treat patients requiring neurological surgical intervention.
4. Identify steps to intervene when complications or comorbidities contribute to complications that arise when treating neurological surgical patients.

**Residency Proficiency Checklist**

Resident Shows Proficiency in:	Cranial fixation – Mayfield fixation device
	Creating burr holes
	Dural closure
	Turning the cranial flap
	Use of plates and screws for rigid fixation of the bone flap
	Use of hydroxyapatite cement and titanium mesh for cranioplasty

**Agenda: Emergency Neurological Surgery**

8 a.m.	<i>Registration &amp; Continental Breakfast</i>	1 p.m.	<b>Faculty TBD Session V: Rigid Fixation</b> Biomechanics & Principles of Rigid Fixation Materials: Titanium vs. Resorbable Manipulation of Plates and Mesh Screw Insertion
8:30 a.m.	<b>Introductory Remarks</b>	1:45 p.m.	<i>Break</i>
8:35 a.m.	<b>Session I: Patient Assessment</b> Intracranial Pressure Monitor (ICP) Review Glasgow Coma Scale (GCS)	2 - 3 p.m.	<b>Hands-On Practicum</b> Dural Closure Rigid Fixation
9:35 a.m.	<b>Session II: Body Positioning and Approaches</b> Pressure Point Cranial Fixation – Mayfield Fixation Device Navigational Positioning Fiducializing	2:15 - 3 p.m.	<b>Faculty TBD Testing Station: During Hands-On Practicum</b> Oral board • 10 - 15 Questions Practicum • Demonstrate proficiency in Patient Assessment Body and Positioning • Demonstrate proficiency in Use of Power & Manual Instrumentation • Demonstrate proficiency in Rigid Fixation
10:15 a.m.	<b>Session III: Use of Power &amp; Manual Instrumentation</b> Power Tools Photos of Manual Instrumentation • Retractors • Suturing • Hemostatics	3 p.m.	<b>Faculty TBD Session VI: Biomaterials</b> Use of Hydroxyapatite Cement
11 a.m.	<b>Hands-On Practicum: Body Positioning &amp; Use of Power</b> Clamping the Head: Mayfield Use of Power Instrumentation to Gain Access	3:45 p.m.	<i>Break</i>
12 p.m.	<i>Lunch</i>	3:55 p.m.	<b>Hands-On Practicum: Biomaterials</b> Cranioplasty: Use of Hydroxyapatite Cement with Titanium Mesh
12:30 p.m.	<b>Faculty TBD Session IV: Dural Closure</b> Lecture – Technique of Application Biologics: Resorption and Healing and Regeneration • Materials • Techniques • Dura Sealants	4:15 p.m.	<b>Faculty TBD Session VII: Skin Closure</b> Glue Sutures Needles Wound Care Carring Concerns
		4:45 - 5 p.m.	<b>Evaluations and Adjourn</b>