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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.

64 year-old female Hx right frontal ICH
No residual weakness
AA 325, CMD for Afib
Sudden onset 30 min.

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