Yale Medical Student Clerkship Handbook Table of Contents

I. Introduction
II. Service Structure
III. General Schedule
IV. Expectations
V. Rotation Goals
VI. Educational Resources
VII. Closing Remarks

Appendix I: Faculty and Subspecialty Listing
Appendix II: Resident Listing and Contact Information

Directors and Coordinators:
Chair, Department of Neurosurgery and Director, Residency Program:
   Dr. Murat Gunel
Clerkship Director and Associate Director, Residency Program:
   Dr. Michael DiLuna, michael.diluna@yale.edu 203-589-9495 (Cell)
Clerkship Coordinators:
   Michelle Nocereto, michelle.nocereto@yale.edu 203-785-5265
   Michelle Chauypong, michelle.chauypong@yale.edu 203-785-3275
For more information:
https://medicine.yale.edu/neurosurgery/
I. Introduction

**Welcome to the Yale Department of Neurosurgery!** We are thrilled to have you on our service and encourage you to take an integral role in all aspects of our patient care during your rotation.

The goal of the Neurosurgery Clerkship is to provide basic insight into the clinical neurosciences and form the basis for knowledge of neurological diseases and how they are managed both surgically and non-surgically. Some examples of surgeries encountered on our service include: aneurysm surgery with craniotomy or endovascular coiling or stenting, carotid endarterectomy, pediatric skull and spine reconstruction and repairs, brain tumor surgery, including awake craniotomy, epilepsy surgery, transnasal surgery, deep brain stimulation and spine surgery, including minimally invasive and deformity correction surgery.

Clerkship students spend a total of 3 weeks on service and become immersed in our day-to-day service, functioning essentially as a supervised intern, working closely with our cohesive group of mid level providers, residents and attendings in the inpatient, outpatient and operating room settings. **Our faculty provide neurosurgical coverage at 10 major hospitals throughout CT and New England,** most of which are part of the Yale New Haven Health System (YNHHS): Yale New Haven Hospital (YNHH)- York Street Campus, St. Raphael’s Campus, Smilow Cancer Hospital at YNHH, Yale New Haven Children’s Hospital; VA Connecticut Healthcare System- West Haven Campus; Greenwich Hospital; Bridgeport Hospital; Lawrence + Memorial Hospital- New London Campus; Westerly (Rhode Island) Hospital and St. Francis Hospital. **Students rotate only at YNHH- York Street.**

Students are encouraged to participate in the evaluation and management of our patients, make rounds with our teams, attend clinics, observe ICU procedures and surgeries, as well as attend academic conferences. Basic surgical skills such as knot tying and suturing are taught. Though a surgical specialty, clerkship hours are similar to other medical student Clerkships and never exceed 80 hours/week with a maximum of 16 hour-shifts, as required by the Yale School of Medicine.

Our service is a busy one and students will have a wide range of surgical and clinical experiences upon their completion. We strongly encourage students to read and prepare prior to clinics and surgery, to help gain the most of the experience. Likewise, we support students taking on as much involvement with our patients as both feel comfortable with and our faculty and staff welcome questions and are dedicated to teaching.

Though highly unlikely, should you ever feel uncomfortable, unfairly treated or harassed while on our service by anyone you encounter, please report any such events to Drs. DiLuna, Gunel, and/or the Yale Office of Student Affairs immediately. Again unlikely, but should you ever feel threatened, please contact Hospital Police, University Police or New Haven Police immediately. Your welfare and safety are top priority to us.

Please let our coordinators know if you would like to set up any meetings with other faculty members. Below, please find a description of our team and general roles, the day-to-day schedule, weekly conferences, and general expectations of clerkship students.
II. Service Structure

There are many members of the Department who work to provide excellence in neurosurgical patient care at Yale. Below, please find brief descriptions:

Attending Neurosurgeons:

The attendings are board certified (or eligible) neurosurgeons who are ultimately responsible for the care and decision-making for our patients. They have clinics, round daily on their patients and are present for all key portions of surgical procedures. They rely on the resident staff to gather and synthesize data, construct plans and ultimately implement their care decisions. With the continued rapid growth of our Department, we continue to expand our number of clinical faculty of attending neurosurgeons and each is sub-specialized with an area of expertise. Please see Appendix I for their listing.

Residents:

Similar to all neurosurgery departments, the Yale Neurosurgery Residency Program is a 7-year training program and we take 2 residents per year. As a general rule, the residents are grouped as follows:

- PGY 1: Interns
- PGY2, 3: Junior Residents
- PGY 4, 5: Off-Service, Mid-Level Residents
- PGY 6: Senior Residents
- PGY 7: Chief Residents

The residents are the heart and soul of our neurosurgery service. Given the demands of our specialty, they can be among the busiest in the hospital and are responsible for knowing the details of the healthcare of all the patients for whom they are responsible. They are heavily supported by mid level provider (MLP) staff (i.e. PAs, APRNs, see below) who help with orders, paperwork and other routine aspects of patient care, allowing them to focus on more educational aspects of workload. The junior residents are primarily responsible for managing patients on the neurosurgery floors and in the Neuroscience Intensive Care Unit (NICU), as well as for seeing new patient consults throughout the hospital and in the Emergency Department. The rotate on “day float” and “night float” systems to allow for better work flow and rest. Junior residents will typically communicate with their supervising senior or chief resident, refine plans of care, and present this information to the attendings. The senior and chief residents run morning and afternoon rounds and are primarily in the operating room during the day, as is the junior-level operating resident.

The neurosurgery service pager is 203-412-1030. This is the main number for other services to call to request new consults and the number for which the nurses call with questions not able to be answered by MLPs. Please see Appendix 2 for a list of Residents and their contact information. Cell phone communication is preferred (please avoid using the service pager).

As discussed, our service is large and thus divided into four teams at the main YNHH-York Street Campus: Neurovascular, Brain Tumor/Spine, Pediatrics and Functional/Epilepsy. A
chief or senior resident runs each team. The chief residents running the Neurovascular and Brain Tumor/Spine teams round separately in the NICU each morning with a junior resident and MLP. The senior residents running the Pediatrics and Functional/Epilepsy services round on their own, as does the senior resident covering the YNHH- St. Raphael’s Campus. You will be assigned to services by our academic chief resident.

_Midlevel Providers:_ MLPs are physician assistants and nurse practitioners who work closely with the residents and comprise the rest of the Neurosurgery inpatient and outpatient teams. MLPs are dedicated to either the floor or NICU and rotate on shifts providing full coverage of days, nights and weekends. They work most closely with the junior residents and help with an enormous amount of work. We are fortunate to have experienced MLPs on the service, some of whom have 10+ years of neurosurgery experience and who have helped train several generations of residents. They are an invaluable resource for both the residents and students on service. Other MLPs are dedicated to subspecialty sections of the Department (i.e. Neurovascular, Pediatrics, Brain Tumors, etc) and primarily function in the outpatient setting.
III. General Schedule

Clerkship students mainly rotate at the YNHH-York Street Campus, including Smilow Cancer Hospital and the Yale Children’s Hospital. In general, the academic chief resident will assign you to a team weekly and surgical cases and/or clinics daily the evening before to allow time for preparation.

General weekday schedule at YNHH- York Street Campus (specific times may vary):

5:30a – 6:00a Pre rounds
6:00a – 6:30a Morning rounds, NICU (6-2)
6:30a Sign out in 6-3 (“run the list”)
7:30a OR (3rd floor, NPOR or SPOR York)

The clerkship students are expected to be on time and preferably early, when possible.

Conferences:

There are several academic conferences and we encourage our students to take part. Friday morning is our academic day and includes “Subspecialty Morbidity and Mortality Conference” at 7am, followed by Neuroscience Grand Rounds and Neurovascular Conference. Medical students (and residents) must attend these conferences and are excused from clinical responsibilities during those times. Likewise, Tuesday we have “Resident Didactic Series” from 6-7pm and student and resident attendance is also mandatory. Other favorite conferences, include Pediatric Tumor Board (Th 4-5pm), Brain Tumor Board (F 1-2pm) and Spine Conference (Th 7-8am).
IV. Expectations

Our Department is bonded by the privilege of being a neurosurgeon and dedication to caring for the sickest patients and their families. It is undeniably hard work, but incredibly rewarding and unique. The purpose of the Subinternship is to provide students insight into having a career as a neurosurgeon. As such, this rotation can be a demanding one, but one we trust will be incredibly valuable and rewarding. You will find neurosurgery to be a very serious discipline, but we sincerely hope you also have fun during this month.

Rounds

It is expected all students, and especially sub-interns, are on time to rounds every day. Attire is professional (i.e. shirt and tie for gentlemen with slacks and a white coat, similar dress for women with closed toe shoes, no jeans). Moreover it is expected and appreciated for subinterns to help facilitate rounds by helping to collect and communicate data and assisting with patient care in an effort to make rounds run smoothly; this also helps to familiarize students with the patients on service.

Morning rounds can be quite busy for the residents as large amounts of data must be collected, synthesized and plans formulated in a relatively short amount of time. Students may be assigned a small number of patients and responsible for collecting their data (i.e. history, vital signs, lab values, etc) each morning? As you become more comfortable with the pace of the service, you may be asked to present your patient on rounds, but do not be insulted if the residents do so. This is merely a reflection of the time constraints under which we operate and not your abilities.

Afternoon rounds are more variable. The day float junior resident signs out to the night float resident at approximately 5:30 PM each day, usually in the resident conference room on 6-3 or in the NICU. Chiefs round separately on their own patients and at their discretion. The afternoon is a good time to ask the chiefs more in depth questions about patient care that there may not have been time for in the morning.

OR

Chief residents assign cases to clerkship students the evening before the cases. Students must be on time to the OR (7:30am for first start cases every day, except Friday which is 8:30am). It is highly suggested students read and prepare for their case the evening before, including the patient’s chart and subject material.

After arriving to the OR, subinterns medical students are expected to please introduce themselves to the attendings, anesthesiologists, circulating nurses and scrub techs. As the students become more known and comfortable, it is encouraged they assist with pulling up scans, getting equipment ready, etc.

Clinics and Conferences:
When not in the OR, students are expected to take part in clinics, conferences and assist the interns and junior residents on the floor and in the NICU with seeing consults and procedures. **On Tuesday evenings and Friday mornings, academic conferences take precedence over any OR cases and student attendance is encouraged and supported.**

**Medical Student Conference Presentation:**

If time permits, clerkship students are encouraged to present an interesting case on Friday morning during conference hours and is usually limited to 10-15 minutes. Individual date and times will be assigned as early as possible in the rotation. **The resident staff will help you!** And attendings are always available for review. This is simply an opportunity for students to share their accumulated knowledge with the Department faculty and staff. Expect an interactive, lighthearted and collegial discussion with questions from the residents and attendings.

**Call and Duty Hours**

Students are expected to take call one time per week and follow ACGME duty guidelines for interns. Specifically, not to exceed 80 hours per week or work longer than 16-hour shifts. While taking overnight call is not mandatory, students interested in taking call are welcome to and can notify the chief resident to augment their schedules so as to adhere to duty hour guidelines.

**V. Rotation Goals**

The goal of the Clerkship is to familiarize students with common neurological diseases and ways to surgically manage them. Our rotation will form the foundation for further knowledge and training. The following is a brief guide for medical students to be familiar with at the completion of the Clerkship:

**General**
- Glasgow Coma Scale
- The neurological exam
- Detailed examination of a comatose patient
- Ventriculostomy and ICP monitors
- CSF dynamics and content
- Basic interpretation of brain and spine CT scans and MRIs
- Traumatic brain injury and elevated ICP
- Management of subdural and epidural hematomas

**Spine**
- Dermatomes and myotomes
- Myelopathy
- Radiculopathy
- Spinal cord syndromes
Cauda equina syndrome
Low back pain work-up and management
Spinal stenosis
Discogenic pain
Spinal decompression
Spinal fusion
Traumatic injuries to the spine
ASIA scale

Tumors
Epidemiology & presentation
Cerebral Edema
Primary brain tumor management (i.e. GBM, meningioma)
Brain metastases management
Radiosurgery
Skull base surgery
Endoscopic surgery
Pituitary and sellar tumors; endocrinologic considerations
Spine tumors

Epilepsy
Types of seizures
Seizure monitoring
Etiology
Anti-epileptic drug management

Functional
Trigeminal neuralgia and pain disorders management
Deep Brain Stimulation (DBS) for movement disorders

Vascular
Aneurysmal Subarachnoid Hemorrhage (SAH) management
Seizures, hydrocephalus, vasospasm
Aneurysm treatment options: Clipping vs coiling
Vascular Malformations
Intracerebral Hemorrhage
Stroke, ischemic and hemorrhagic

Pediatrics
Hydrocephalus-presentation and treatment
Ventriculoperitoneal shunts
Endoscopic third ventriculostomy
Pediatric Brain and Spine Trauma
Pediatric Brain and Spine Tumors
Neonatal intraventricular hemorrhage

Peripheral Nerve
Basics

VI. Educational Resources
The residents have a substantial library of relevant books for their neurosurgical training in the resident conference room on 6-3. Students are welcome to use them, but are not allowed to take them home. Other books are available at the Yale Medical Library. We highly suggest considering purchasing a copy of “Greenberg” (Handbook of Neurosurgery, Mark S. Greenberg, Nicolas Arredondo, Edward A. M. Duckworth, and Tann A. Nichols).

Other useful books:

- Surgical Recall, Lourne H. Blackbourne, 3rd or 4th Ed. (An excellent introduction to general surgery and has instruction on knot tying. The section on neurosurgery is a reasonable introduction).
- Goldberg, Clinical Neuroanatomy Made Ridiculously Simple
- Plum and Posner, Diagnosis of Stupor and Coma
- Winn et al. (eds.), Youman’s Textbook of Neurological Surgery

Helpful websites include:

- CNS University http://univ.cns.org/
- American Association of Neurological Surgeons http://www.aans.org/
- Congress of Neurological Surgeons http://www.cns.org/

VII: Closing Remarks

While on the Yale Neurosurgery Clerkship, please remain cognizant that we see and care for some of the sickest patients in the hospital. People who are sick often have difficulty coping with their illness; those who have neurological impairments often have trouble even understanding their situations and it can be that much more challenging. Same can be true for their loved ones and even for the neurosurgeons caring for them. Please understand that people can handle difficult situations differently, but that every resident and attending in our Department respects our patients and knows his or her responsibility towards them. We expect the same from our students. No one is immune to the demands of the Neurosurgery service and please know we are here to support medical students as much as we are here to support each other through difficult times. Please contact Drs. DiLuna or Gunel if you experience any issues with coping or need support or feel someone else might benefit.

We sincerely look forward to working with you and to your productive and successful career in our discipline. Once again, welcome and have fun!

Best Regards,

The Yale Department of Neurosurgery
Murat Gunel, MD, FACS, FAHA
Nikolaou-German Professor of Neurosurgery and Professor of Genetics and of Neuroscience
Chair, Department of Neurosurgery
Chief, Neurosurgery, Yale New Haven Health System
Chair, Perioperative Executive Leadership Committee
Director, Residency Program
Member, National Academy of Medicine
Co-Director, Yale Program on Neurogenetics

Joseph Cheng, MD, MS, FAANS, FACS
Professor of Neurosurgery
Vice Chair of Clinical Affairs, Department of Neurosurgery
Director, Neurosurgery Spine Fellowship

Joseph Massa Piepmeier, MD
Nikolaou-German Professor of Neurosurgery
Vice Chair of Academic Affairs, Neurosurgery
Chief, Brain Tumor Surgery

Khalid M Abbed, MD
Associate Professor of Neurosurgery
Chief, Neurosurgery Spine
Director, Minimally Invasive Spine Surgery
Director, Spine Tumor Surgery
Co-Director, YNHH Spine Center

Michael Apuzzo, MD
Distinguished Adjunct Professor of Neurosurgery

Juan Bartolomei, MD
Assistant Professor of Neurosurgery

Veronica L.S. Chiang, MD
Associate Professor of Neurosurgery and of Therapeutic Radiology
Director, Stereotactic Radiosurgery
Director, Gamma Knife Center, YNHH
Director, Stereotactic Radiosurgery Fellowship

Michael Louis DiLuna, MD
Assistant Professor of Neurosurgery
Chief, Pediatric Neurosurgery
Associate Residency Program Director

Patrick Doherty, MD
Clinician
Director, Neurosurgery, Lawrence + Memorial Hospital

Charles Cecil Duncan, MD
Professor of Neurosurgery and of Pediatrics

Jason Lee Gerrard, MD, PhD
Assistant Professor of Neurosurgery and of Neuroscience
Chief Functional Neurosurgery
Chief, Trauma Neurosurgery, YNHH

Ryan M Hebert, MD
Assistant Professor of Neurosurgery
Appendix I: Faculty and Subspecialty Listing
Appendix II: Resident List 2016 – 2017:

David Gimbel, MD  
*Chief Resident – PGY7*  
Cell: 203-507-1016

Ryan Grant, MD  
*Chief Resident – PGY7*  
Cell: 248-761-4683

Eyiymisi Damisah, MD  
*Senior Resident – PGY6*  
Cell: 562-322-0248

Branden Cord, MD  
*Infolded Vascular Fellow – PGY5*  
Cell: 650-353-6067

Joaquin Camara-Quintana, MD  
*Infolded Spine Fellow - PGY5*  
Cell: 650-213-6587

Jacky Yeung, MD  
*Research Resident – PGY4*  
Cell: 517-775-7780

Gregory Kuzmik, MD  
*Infolded Spine Fellow - PGY4*  
Cell: 703-819-1790

Elena Fomchenko, MD  
*Junior Resident – PGY3*  
Cell: 646-243-0767
Ramana Gorrepati, MD
Junior Resident - PGY3
Cell: 563-505-7332

Stephanie Cheok, MD
Junior Resident – PGY2
Cell: 415-272-7621

Abhijeet Gummadavelli, MD
Junior Resident – PGY2
Cell: 513-377-7473

Chris Hong, MD
Intern – PGY1
Cell: 203-804-2970

Adam Kundishora, MD
Intern – PGY1
Cell: 207-653-2617