I. Introduction

Welcome to the neurosurgery service. We are thrilled to have you as a part of this service for the next 3 weeks and encourage you to take part in all aspects of our service during your time with us. We encourage you to take on as much responsibility for our patients as you feel comfortable doing and to ask questions.

Students spend 3 weeks on service and will present at one of our conferences. Students will participate in the evaluation and management of our patients, operative procedures, rounds, clinics and conferences. Duty hours are identical to PGY1’s as required by the Medical School and hours are limited to 80 hours/week with a maximum of 16 hours shift. Students are expected to pre-round in the ICU every morning and to pre-write ICU notes for all patients. Please coordinate with the residents regarding pre-rounding.

Below, please find a description of our team and general roles, the day-to-day schedule, weekly conferences, and our expectations of you.

II. Team Structure

*Attendings:*

The attendings are ultimately responsible for the care decisions made for our patients. They run weekly clinics, round daily on their patients and are present for all key portions of OR procedures. They rely on the residents to gather and synthesize data, construct plans and ultimately implement care decisions. The attendings, their roles and areas of specialty are listed below.

<table>
<thead>
<tr>
<th>Name</th>
<th>Role and Specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murat Gunel</td>
<td>Department Chair and Program Director, Vascular Neurosurgery</td>
</tr>
<tr>
<td>Dennis Spencer</td>
<td>Epilepsy and Pituitary Surgery</td>
</tr>
<tr>
<td>Charles Duncan</td>
<td>Residency Director, Pediatric Neurosurgery</td>
</tr>
<tr>
<td>Joseph Piepmeier</td>
<td>Surgical Neuro-Oncology</td>
</tr>
<tr>
<td>Joseph Cheng</td>
<td>Department Vice Chair, Spine Neurosurgery</td>
</tr>
<tr>
<td>Veronica Chiang</td>
<td>Director of Gamma Knife Center, Surgical Neuro-Oncology</td>
</tr>
</tbody>
</table>
Residents:

The residents are the heart and soul of the neurosurgery service. They are among the busiest residents in the hospital and are responsible for knowing all the patients for whom they are responsible. The junior residents are primarily responsible in this regard, and spend most of their time on the floor (6-3, South Pavilion), in the ICU (6-2), and seeing new consults. They then communicate with their senior counterparts, refine plans, and present to the attendings. The senior residents run morning or afternoon rounds, cover operative cases, and run residents’ clinic.

The neurosurgery service pager is 203-412-1030. This is the main number other services call to request new consults, the number which the attendings call for information about their patients, and the number which the nurses call with questions (in short, a one-stop-shop for neurosurgery questions at YNHH). Though you are welcome to contact us through this number, please do so sparingly as the resident with this pager is often the busiest person in the hospital.

The service is divided into four teams: Vascular, Tumor/Spine, Pediatrics and Functional/Epilepsy. A chief or senior resident runs each team. The chief residents running the Vascular and 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. Spend time with each team during your rotation, although you will see there is much overlap, particularly at the junior resident level.

Residents 2016 - 2017:

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Contact Number (cell)</th>
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</thead>
<tbody>
<tr>
<td>David Gimbel</td>
<td>Chief Resident</td>
<td>203-507-1016</td>
</tr>
<tr>
<td>Ryan Grant</td>
<td>Chief Resident</td>
<td>248-761-4683</td>
</tr>
<tr>
<td>Eyiyemisi Damisah</td>
<td>Senior Resident</td>
<td>562-322-0248</td>
</tr>
<tr>
<td>Branden Cord</td>
<td>Senior Resident</td>
<td>650-353-6067</td>
</tr>
</tbody>
</table>
Joaquin Camara-Quintana  Senior Resident  650-213-6587

Yeung, Jacky  Lab Resident  517-775-7780

Kuzmik, Gregory  Lab Resident  703-819-1790

Fomchenko, Elena  Junior Resident  646-243-9767

Gorrepati, Ramana  Junior Resident  563-505-7332

Cheok, Stephanie  Junior Resident  415-272-7621

Gummadavelli, Abhijeet  Junior Resident  513-377-7473

Hong, Christopher  Intern  203-

Kundishora, Adam  Intern

Midlevel Providers: The MLPs work intimately with the residents and comprise the rest of the Neurosurgery inpatient team. The MLPs rotate between shifts on the floor, ICU, and nights (2pm to midnight). They work most closely with the junior residents during the day. We are fortunate to have experienced midlevel providers on the service, some of whom have 10+ years of neurosurgery experience and who have trained several generations of residents. They are an invaluable resource for both the residents and students on service.

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Contact info (pager)</th>
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</thead>
<tbody>
<tr>
<td>Judy Nunes, PA</td>
<td>PA Chief</td>
<td>203-370-3136</td>
</tr>
<tr>
<td>Michael Korn, PA</td>
<td>Floor and ICU care</td>
<td>917-825-8538 (cell)</td>
</tr>
<tr>
<td>David Tong, PA</td>
<td>Floor and ICU care</td>
<td>203-370-6133 (pager)</td>
</tr>
<tr>
<td>Sarah Fountain, RN, PA</td>
<td>Floor and ICU care</td>
<td>413-575-1561 (cell)</td>
</tr>
<tr>
<td>Courtney Hollingsworth, PA</td>
<td>Floor and ICU care</td>
<td>203-766-1299 (pager)</td>
</tr>
<tr>
<td>Jennifer Robinson, NP</td>
<td>Floor and ICU care</td>
<td>978-303-5930 (cell)</td>
</tr>
<tr>
<td>Jessica White, PA</td>
<td>Floor and ICU care</td>
<td>203-417-4547 (pager)</td>
</tr>
</tbody>
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III. Schedule

General weekday schedule:
5:30a – 6:15a    Pre rounds, floor (6-3)
6:15a – 7:30a  Morning Rounds, NICU (6-2)
7:30a – 3:00p  OR (most cases are in North Pavilion rooms 9 and 10 and South Pavilion rooms 9 and 13, and the Pediatric OR but check the Navicare schedule)
3:00p – 4:30p  Afternoon Rounds, NICU

Clinics:

*Monday*

- Gamma Knife Radiosurgery (Chiang), 9:15a-12:00p, Yale Physician’s Building, basement
- Pediatric Neurosurgery Clinic (Duncan), 8:30a to 12:00p, Peds Specialty clinics (2nd floor W. Pavilion), (DiLuna), 8:30a-12:00p, Long Wharf, 2nd Floor, YNH Pedi Neuro
- Spine Clinic (Petrucci), 9:00a-3:00p, (Tomak), 9:00a-4:00p, (Laurans), 8:00a-11:15a, Spine Center Long Wharf, 6th Floor

*Tuesday*

- Spine Clinic (Abbed), 8:00a to 4:00p, Spine Center Long Wharf
- Neuro-oncology Clinic (Piepmeier), 1:00p to 4:00p, Smilow 8th floor

*Wednesday*

- Neurovascular Clinic (Bulsara, Matouk, Gunel), 10:00a-12:00p, Yale Physicians’ Building, basement
- Epilepsy Clinic (Spencer), 1:00p to 5:00p, Yale Physicians’ Building, basement
- Functional Clinic (Gerrard), 10:00a-4:30p, Yale Physicians’ Building, basement
- Pediatric Neuro-Oncology (Duncan/DiLuna), 1:00p – 4:00p, YNH Smilow 7, YNH Smilow Pedi Clinic
- Neuro-Oncology, (Moliterno-Gunel), as needed 1:00p-4:00p, YNH Smilow 8
- Spine Clinic (Cheng), 8:30a-3:30p, (Petrucci), 9:30a-3:30p, Spine Center Long Wharf, 6th Floor

*Thursday*

- Spine Clinic (Abbed), 8:30a to 4:00p, Spine Center Long Wharf, 6th Floor
- Spine Clinic (Laurans), 8:00a to 1:00p, Spine Center Long Wharf, 6th Floor
- Gamma Knife Radiosurgery, (Chiang), 1:00p-4:00p, YNH Smilow lower level

*Friday*
Pediatric Neurosurgery Clinic (Diluna), 8:30a to 12:00p, Peds Specialty clinics (2nd floor W. Pavilion)

Neuro-oncology Clinic (Piepmeier/Moliterno-Gunel), 8:30a - 12p, Smilow 8th floor

Conferences:

**Monday**

Epilepsy Conference, 3:30p-5:30p, Smilow 4th floor room 101-A (optional)

**Tuesday**

Brain/Spine Tumor Board- 3:00p-4:00p, Smilow 4th Floor, NP215-B

Resident Didactic Series- 6:00p-7:00p, TMP 431

**Wednesday**

M & M, 7:00a – 8:00a, Brady Auditorium (BML)

Neuroscience Grand Rounds, 8:00a – 9:00a, Brady Auditorium (BML)

**Effective July 1, 2016 M&M and Neuroscience Grand Rounds will be held in the Cohen Auditorium in the Harris Building and will be held on Friday’s.****

Vascular Conference, 9:00a – 10:00a, Brady Auditorium or Greenspan Conference room, Radiology department, 2nd floor of South Pavilion

**Thursday**

Pediatric Tumor Board, 4:00p – 5:00p, Smilow 4th Floor

Spine Conference, 7:00a-8:00a, Spine Center Long Wharf, 6th Floor

**Friday**

Neuro-Oncology Tumor Board, 1:00p – 2:00p, Smilow 4th Floor Conference room

IV. Expectations

1. Rounds:

We expect all students will be on time for rounds every day and help facilitate rounds by helping to collect and communicate data and assisting with small tasks. Although some of this may appear menial, it is of considerable help and makes morning rounds run smoothly; this also helps to familiarize students with the patients on service.
Morning rounds are among the busiest time for the residents. Large amounts of data must be collected, synthesized and plans made on the entire clinical service in a little over an hour. You are expected to follow 1 to 2 patients on whom you have operated, collect their data in the morning and follow their postoperative course. 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 “take over”. 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” resident signs out to the “night float” resident at approximately 5:30 PM, usually in the 6-3 conference room or in the NICU. Chiefs may round separately on their own patients at their discretion. The afternoon is a good time to ask the chiefs questions about patient care that there may not be time for in the morning.

2. OR:

Students should divide the day’s operative cases amongst themselves and be on time to the OR (7:30 for morning cases). Try to identify which cases you will attend the night before and read about the case before going to the OR. A weekly schedule of cases is emailed to the residents on the weekend — if you do not receive this by Sunday afternoon please email the chiefs and they will forward it to you.

The operating room is a new place for many students, especially if you have not completed a surgery rotation yet. With this in mind, most of your exposure to operative neurosurgery will be observational. As you become more comfortable, we hope to include you in basic surgical activities such as suturing, irrigating, and cutting sutures. The residents are happy to spend some time teaching you these basics outside of the OR – be sure to try to schedule this early in the rotation.

While in the OR, please introduce yourself to the circulating nurses and scrub nurse/tech. They will help orient you to the OR as the resident gets the case ready. Be sure to recognize that everything which is blue in the OR is sterile and that you may not touch any of this until you have scrubbed. Review the patient’s chart to understand his or her past medical history, presenting symptoms etc. Also be sure to introduce yourself to the attending surgeon.

3. Clinics and Conferences:

When not in the OR, students are expected to take part in clinics and conferences. You will gain the most by trying to have as broad an experience in clinic as possible. On Wednesdays, conferences take precedence over any OR cases.

4. Medical Student Conference Presentation:

Once during your rotation you will present an interesting case from the past week. The resident staff will help you choose the case. You will be expected to present the history, physical, imaging studies, rudimentary details of the surgery, immediate post-op course and relevant anatomy, physiology and clinical treatment options. This is your opportunity to share your
accumulated knowledge base with your peers and show-off what you know to the neurosurgery staff. Expect to interact with them and be questioned by the residents and attendings. You should primarily focus on teaching your peers and demonstrating your understanding of the case. (Avoid pimping your friends.)

It is to your advantage to decide early in the week who will present at Friday medical student conference. Students must go over their presentation with a senior or chief resident prior to presentation – please leave ample time to schedule this. Time during the weekday may be set aside to work on presentations, but please clear this with the chief resident first.

5. Call and Duty Hours

   Third year students are not expected to stay overnight. Long days are acceptable but you are expected to have 10 hours between shifts. Students are welcome on the weekend particularly when Dr. Spencer has rounds on Saturday morning. You, like a PGY 1, are limited to 16 hours of duty per day and 80 hours/week.

VI. Educational Goals

   By the end of this rotation, we hope you will have had a thorough exposure to neurosurgical disease and the tools at our disposal to treat it. The goal is to familiarize students with common neurosurgical diseases at a level such that those who pursue a career in neurosurgery will be prepared for the next steps. Below is a brief list of what compromise common neurosurgical diseases. You are not expected to master this in the few weeks you are with us. We do expect you to develop a basic familiarity with the following:

General management
   Glasgow Coma Scale
   Examination of comatose patient
   Ventriculostomy and ICP monitors
   CSF dynamics and content
   CT scan and MRI imaging brain and spine
   Contrast vs. non-contrast studies

Spine
   Dermatomes and myotomes
   Myelopathy
   Radiculopathy
   Spinal cord syndromes
   Cauda equina syndrome
   Low back pain DDx, workup, surgical and conservative treatment options
   Spinal stenosis
   Discogenic pain
   Spinal decompression
Spinal fusion
Tumors
   Epidemiology & presentation
   Cerebral Edema
   Headache DDx
   Intracerebral metastasis
   Meningiomas
   Glioblastoma Multiforme (GBM)
   Pituitary tumors
Epilepsy
   Types of seizures
   Seizure monitoring
   Etiology
   Anti-epileptics
Functional
   Trigeminal neuralgia
   Deep Brain Stimulation
Vascular
   Aneurysmal Subarachnoid Hemorrhage
      Seizures, hydrocephalus, vasospasm
      Clipping vs coiling
   Arteriovenous malformation
      Surgery vs gamma knife
   Intracerebral Hemorrhage
      hypertensive hemorrhage
      subdural and epidural hematomas
Pediatrics
   Hydrocephalus-presentation and treatment
   Ventriculoperitoneal shunts
   Endoscopic third ventriculostomy

VII. Resources

The Library has purchased access to Thieme eNeurosurgery, 
There isn't a specific user account. All you have to do is:
A) Make sure you are on the Yale or Hospital Network (on campus, VPN, or Library Proxy)
B) Click on the Login button on the home page of eNeurosurgery

Numerous books are available in the resident’s conference room on 6-3. Students are encouraged to use them for research, but are not allowed to take them home. Other books are available at the Yale Medical Library.
Some books you may find particularly useful are:

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.

Handbook of Neurosurgery, Mark S. Greenberg, Nicolas Arredondo, Edward A. M. Duckworth, and Tann A. Nichols (Popular among residents. Recommended for students)

Goldberg, Clinical Neuroanatomy Made Ridiculously Simple

Plum and Posner, Diagnosis of Stupor and Coma

Winn et al. (eds.), Youman’s Textbook of Neurological Surgery

Useful websites include:

CNS University
http://univ.cns.org/

Neurosurgery links from MGH
http://neurosurgery.mgh.harvard.edu/nsurg-ms.htm#OtherNSEdu

American Association of Neurological Surgeons
http://www.aans.org/

Congress of Neurological Surgeons
http://www.cns.org/

If there are ever questions or concerns please contact us at any time

Dr. Michael DiLuna, michael.diluna@yale.edu
Dr. Murat Gunel, murat.gunel@yale.edu

**FEEDBACK:** Students should seek out either Dr. Michael DiLuna on each Friday of their rotation, immediately following Medical Student Conference at 1:00 p.m. to initiate feedback on their performance. They should bring along blank Feedback Forms (which are attached) to the meeting.

An important final note:
While on service, keep in mind 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 neurologic disease often have trouble even understanding it and are that much more challenging. Because we do this day in and day out, for up to 88 hours per week, every week, we as neurosurgeons often develop our own coping mechanisms, including desensitization and gallows humor. Please understand that if, at times, we appear abrupt, insensitive, or inappropriately humorous regarding what is clearly serious disease, every one of our residents and attendings respects our patients and knows his or her responsibility towards them. Our jokes and comments are often for our own sanity and protection; indeed, were we overly tied to the experience of the service you would likely find a collection of highly depressed residents. Gallows humor allows us to function as normal people when perpetually surrounded by patients facing permanent head trauma, paralysis, quadriplegia, or terminal brain cancer. Feel free to ask us openly about any of this.
MID-ROTATION FEEDBACK FORM

DATE___________________  SERVICE __________________________

STUDENT NAME: ____________________________________________

DISCUSSED:

- Areas of strength (list three):
  1. 
  2. 
  3. 

- Skills to improve (list three):
  1. 
  2. 
  3.
Student Signature: ______________________________________

Faculty/Resident Signature: ______________________________

**Patient Care:** Students are expected to provide patient care that is compassionate, appropriate and effective for the promotion of health, prevention of illness, and treatment of disease.

<table>
<thead>
<tr>
<th>Competency</th>
<th>NA</th>
<th>Learning</th>
<th>Usually effective</th>
<th>Consistently effective</th>
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<tbody>
<tr>
<td>Sensitive to pt age, gender, culture, social, economic circumstances</td>
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<td>Gathers essential and accurate information about pt</td>
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<td>Synthesize clinical history, exam, laboratory results to arrive at diagnosis</td>
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<td>and treatment plan</td>
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<td>Explains illness and treatment plan to pt and family members in format</td>
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<td>conducive to understanding</td>
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<tr>
<td>Perform thorough physical exam</td>
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<tr>
<td>Perform appropriate diagnostic/therapeutic procedures</td>
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<tr>
<td>Provide pt education for health maintenance</td>
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<tr>
<td>Charting in clear, concise and thorough manner to enhance communication</td>
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**Medical Knowledge:** Students are expected to demonstrate knowledge of established and evolving biomedical, clinical and social sciences, and the application of their knowledge to patient care and the education of others.

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<thead>
<tr>
<th>Competency</th>
<th>NA</th>
<th>Learning</th>
<th>Usually effective</th>
<th>Consistently effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical knowledge (topics covered in syllabus)</td>
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<tr>
<td>Basic science knowledge</td>
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<tr>
<td>General clinical knowledge</td>
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</tbody>
</table>
**Applied knowledge**

*Practice-Based Learning and Improvement:* Students are expected to be able to use scientific evidence and methods to investigate, evaluate, and improve patient care practices.

<table>
<thead>
<tr>
<th>Competency</th>
<th>NA</th>
<th>Learning</th>
<th>Usually effective</th>
<th>Consistently effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locate, appraise, assimilate evidence from scientific studies related to patient’s health problems</td>
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<tr>
<td>Critically review published medical literature related to patient problems</td>
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<tr>
<td>Utilize information technology to access on-line medical information to support their own education</td>
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<tr>
<td>Actively participates in education of students, residents, other health professionals</td>
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</table>

**Communication and Interpersonal Skills:** Students are expected to demonstrate interpersonal and communication skills that enable them to establish and maintain professional relationships with patients, families, and other members of health care teams.

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<tr>
<th>Competency</th>
<th>NA</th>
<th>Learning</th>
<th>Usually effective</th>
<th>Consistently effective</th>
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</thead>
<tbody>
<tr>
<td>Communicate effectively with patients and families</td>
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<tr>
<td>Communicate effectively with other medical professionals (residents, attendings) and office staff</td>
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<tr>
<td>Enable pts to be comfortable asking questions about their disease or treatment</td>
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**Professionalism:** Students are expected to demonstrate behaviors that reflect a commitment to continuous professional development, ethical practice, an understanding and sensitivity to diversity and a responsible attitude toward their patients, their profession, and society.
Demonstrate respect, compassion, integrity, responsiveness to needs of patients

Demonstrate commitment to ethical principles of patient privacy and confidentiality

Demonstrate respect for dignity of patients

Demonstrate respect for medical professionals, support staff, office staff

Attends all clinics and conferences; Punctuality; Communicates to attending if unable to attend

Dresses professionally and appropriately for patient care

**Systems-Based Practice:** Students are expected to demonstrate both an understanding of the contexts and systems in which health care is provided, and the ability to apply this knowledge to improve and optimize health care.

<table>
<thead>
<tr>
<th>Competency</th>
<th>NA</th>
<th>Learning</th>
<th>Usually effective</th>
<th>Consistently effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Works effectively in various health care delivery settings and systems</td>
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<tr>
<td>Demonstrates understanding of methods of controlling health care costs and allocation of resources</td>
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<tr>
<td>Knowledge of relative costs of procedures and treatments and impact on patients</td>
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<tr>
<td>Advocates for quality patient care and assists patients in dealing with system complexities</td>
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