I. Introduction

Welcome to the neurosurgery service. We are thrilled to have you as a part of this service for the next 2-4 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.

Sub-interns spend 4 weeks on service and will present at Friday morning “M&M” conference to the entire faculty, the residents, and other students. During this time, the faculty will test their level of understanding of the case, including the diagnostic dilemma and treatment options. Sub-interns are expected to take call and to stay overnight when they do. Duty hours follow ACGME guidelines and are limited to 80 hours/week. They will be given proportionally more responsibility in the operating room, and by the end of the rotation should have adequate operative skills such that they can close a case assisted. Sub-interns 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.

There is a zero tolerance in Neurosurgery for any harassment or bullying. If any such event occurs please contact the chief resident, faculty and/or Medical School Affairs immediately. If you ever feel threatened, please contact Hospital Police, University Police or New Haven Police immediately.

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.

Murat Gunel Department Chair, Neurovascular Surgery
Charles Duncan Pediatric Neurosurgery
Joseph Piepmeier Surgical Neuro-Oncology
Dennis Spencer Epilepsy and Pituitary Surgery
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 and cover operative cases.

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>
</tr>
</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>
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<tr>
<td>Eyiyemisi Damisah</td>
<td>Senior Resident</td>
<td>562-322-0248</td>
</tr>
<tr>
<td>Branden Cord</td>
<td>Lab Resident</td>
<td>650-353-6067</td>
</tr>
<tr>
<td>Name</td>
<td>Role</td>
<td>Contact info (pager)</td>
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</tr>
<tr>
<td>Michael Korn, PA</td>
<td>Floor and ICU care</td>
<td>917-825-8538 (cell)</td>
</tr>
<tr>
<td>Vivian Lee, PA</td>
<td>Floor and ICU care</td>
<td></td>
</tr>
<tr>
<td>David Tong, PA</td>
<td>Floor and ICU care</td>
<td>203-370-6133 (pager)</td>
</tr>
<tr>
<td>Jessica White, PA</td>
<td>ICU Senior PA</td>
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</tr>
</tbody>
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**III. Schedule**

General weekday schedule:

- 5:30a – 6:00a    Pre rounds, floor (6-3)
- 6:00a – 6:30a    Morning Rounds, NICU (6-2)
- 6:30a           Sign out in 6-3 (“run the list”)
- 7:30a           OR YNHH (3rd floor) and SRC OR (2nd floor)

Clinics:
Monday

Gamma Knife Radiosurgery (Chiang), 9:15a-12:00p, Yale Physicians’ Building, basement
Pediatric Neurosurgery (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-11:15p,
Spine Center Long Wharf, 6th Floor

Tuesday

Spine Clinic (Abbed), 8:00a-3:30p, Spine Center Long Wharf, 6th Floor
Neuro-oncology Clinic (Piepmeier), 1:00-4:00p, Smilow 8th floor

Wednesday

Neurovascular Clinic (Bulsara, Gunel, and Matouk), 10:00a-12:00p, Yale Physicians’ Building, basement
Epilepsy Clinic (Spencer), 1:00p-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), 8:00a-3:30p, (Laurans), 8:00a-1:00pm, 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
Neurovascular (Bulsara), 1st and 3rd Friday 9:30a-12:00p, Smilow 8th floor, 2nd and 4th Friday 10:00a-12:00p, Yale Physicians Building, basement, (Matouk), 9:00a-12:00p, Yale Physicians Building, basement
Spine Surgery (Petrucci), 9:30a-3:30p, Greenwich office (1171 East Putnam Ave.), (Tomak), 9:00a-4:00p, North Haven office (6 Devine Street)
Epilepsy Clinic (Spencer), 1st and 3rd Friday, 9:00a-12:00p, Yale Physicians Building, basement

Conferences:
Monday
   Epilepsy Conference, 3:30p-5:30p, Smilow 4th floor room 101-A
   Gunel Lab Tumor meeting, 2:00p-3:30p, 3rd Floor Conference room TAC Building

Tuesday
   Brain/Spine Tumor Board- 3:00p-4:00p, Smilow 4th Floor, NP215-B
   Resident Didactic Series - 6:00p-7:00p LLCI 8th Floor Conference Room

Wednesday

Thursday
   Pediatric Tumor Board, 4:00p-5:00p, Smilow 4th Floor
   Spine Conference, 7:00a-8:00a, Long Wharf, 6th Floor

Friday
   M & M, 7:00a – 8:00a, Cohen Auditorium, 230 South Frontage Road
   Neuroscience Grand Rounds, Cohen Auditorium, 230 South Frontage Road
   Neuroscience Grand Rounds, 8:00a-9:00a, Cohen Auditorium
   Vascular Conference, 9:00a-10:00a, Greenspan Conference room, Radiology department, 2nd floor of South Pavilion
   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 to 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 Fridays, 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 at Friday’s M&M conference. The resident staff will help you. 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. 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
Students should take call once per week. When on call, you should follow along with the resident carrying the 203-410-1030 pager, seeing consults and urgent issues and helping with post-op checks. ACGME duty hours are followed.

**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, 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.

**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 sub interns 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
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, 3\textsuperscript{rd} or 4\textsuperscript{th} 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 Sub-Interns)

  Goldberg, Clinical Neuroanatomy Made Ridiculously Simple

  Plum and Posner, Diagnosis of Stupor and Coma
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/