



University of California
San Francisco



UCSF MEDICAL CENTER DEPARTMENT OF PATHOLOGY NEUROPATHOLOGY DIVISION

PRIMER FOR Neuropathology Rotation

M-551
505 Parnassus Avenue
San Francisco, CA 94143-0102
Phone: 415-476-5236
Administrator: Angela Mok

Updated: Jan 2019

FACULTY

Arie Perry, MD, Director
Eric Huang, MD, PhD
Marta Margeta, MD, PhD
Joanna Phillips, MD, PhD

Andrew W. Bollen, DVM, MD
Han Sung Lee, MD
Melike Pekmezci, MD
David Solomon, MD PhD
Tarik Tihan, MD, PhD

INTRODUCTION

*This manual is intended to orient you to your rotation in Surgical Neuropathology. Below, you will find the rotation objectives as well as information on resources, routine procedures in surgical neuropathology. **Please contact the neuropathology administrative assistant, Ms. Angela Mok (angela.mok@ucsf.edu , phone:415-476-5236) for assistance with schedules or other questions.***

Faculty, Staff & Important Phone numbers:

PERSONNEL	Office	Phone	Pager	E-mail
Administrative Assistant				
Angela Mok	M551	476-5236		angela.mok@ucsf.edu
Faculty				
Andrew W Bollen	M553	502-6605	443-4030	andrew.bollen@ucsf.edu
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Tarik Tihan	M551	514-9332	443-1390	tarik.tihan@ucsf.edu
First Year Fellows				
Jeffrey Hofmann	M580	476-5236	443-7129	jeffrey.hofmann@ucsf.edu
Emily Sloan	M580	476-5236	443-6503	emily.sloan@ucsf.edu
Important Phone Numbers				
Surgical Path Gross Rm	M580	353-1608	353-1608	
Immunopathology	M567	353-1623	353-1623	
Electron Microscopy	S568	353-2673	353-2673	
Morgue	M55	353-1629	353-1629	

Schedule of Meetings & Conferences:

	Monday	Tuesday	Wednesday	Thursday	Friday
8 am			Autopsy Conference	M.O.D. Conference	
9 am		Consultants Conference M557	Neuropathology Autopsy M55	Neuroradiology Conference N721	Muscle/ Nerve Conf M557
10 am	NP Teaching Conference				
12 pm	Resident Lecture		Resident Lecture	Neurooncology Tumor Board L33 12.30 pm	Resident Lecture
1 pm					Pediatric Neurooncology (Mission Bay)
2 pm					
3.30-5 pm	Neuropathology Sign-out Sessions with the service attending				
5 pm					<i>Virchow Rounds</i>

 Department-wide functions

Note: Department-wide functions are optional (but recommended) to visiting fellows and observers.

INTRODUCTION:

Neuropathology Division is located at Room M551, Moffitt Building in the Parnassus campus. The offices of Drs. Perry, Tihan and Bollen are also located on the same floor.

The first contact person when you arrive at the division is Angela Mok, our divisional administrative assistant who can orient you and give you a tour of the critical locations such as the sign out area, visitors' area, gross room and the residents' room. She can also direct you to the locations of other activities (see page 3). Please check with Angela, and make sure you have completed all the legal necessities before commencing your rotation. In addition, we would appreciate if you can give Angela all the necessary contact information so we can reach you when needed.

The learning objectives for the rotation are often dependent on you, and based on your experience and level of interest, we can work with you to develop your learning objectives list, which will help us determine what kind of activities would be most beneficial and would be worth pursuing during your rotation.

Even though attendance is optional for all the activities, we would kindly ask you to inform Angela Mok of your daily routine and whether you will be present or absent for a particular reason on any given day.

If you may need a record of your rotation or a reference letter at any time in the future, you will need to complete the attendance record on Page 10. The division of neuropathology will not issue any certificate, diploma or any form of qualification for the rotation, but we will be happy to provide an official account of your rotation if your attendance record is completed and signed by you.

Enjoy your adventure into the world of neuropathology

Teaching Sets:

Surgical Neuropathology Teaching Set

Located in M551. The access is by appointment, and the slides can be checked out on a daily basis. The information for the teaching set is also available as a FileMaker document. (Note: There are also a number of neuropathology teaching slides within Surgical Pathology Teaching set kept in the residents room)

Total number of cases =570

Intraoperative Smear Teaching Set

Located in M551. The access is by appointment, and the slides can be checked out on a daily basis. The information for the teaching set is also available as a FileMaker document.

Total number of cases = 75

Stereotactic Biopsy Teaching Set

Located in M551. The access is by appointment, and the slides can be checked out on a daily basis. The information for the teaching set is also available as a FileMaker document.

Total number of cases = 50

Surgical Pathology Teaching Set

Located in the residents' room in M578, the slide set includes more than 1000 cases and covers most of surgical pathology excluding medical kidney and transplant pathology. To access the surgical pathology teaching set, please contact one of the chief residents.

Reference Textbooks: *There are numerous other books in our Unit and in the individual libraries of Drs. Perry, Bollen and Tihan. These books can be made available to rotating fellows/residents with special arrangement. The recommended references include:*

1. **Practical Surgical Pathology (Perry & Brat)**
2. **Diagnostic Pathology, Neuropathology (Burger&Scheithauer)**
3. **Basic Neuropathology (Gray, Girolami, Pourier)**
4. **Practical Review of Neuropathology (Fuller & Goodman)**
5. **Smears and Frozen Sections in Neuropathology (Peter Burger)**
6. **WHO Classification of CNS Tumors (Louis et al 2016)**
7. **Atlas of Pediatric Brain Tumors (Adesina, Tihan, Fuller, Poussaint)**
8. **Structural & Molecular Basis of Skeletal Muscle Disease (Karpati Ed.)**
9. **Pathology of Skeletal Muscle (Carpenter & Karpati)**
10. **Biopsy Diagnosis of Peripheral Neuropathy (Midroni & Bilbao)**
11. **Greenfield's Neuropathology (Graham & Lantos)**
12. **Neuroanatomy through Clinical Cases (Blumenfeld)**

STANDARD PROCEDURES

Frozen Sections:

Frozen sections are performed at the Surgical Pathology Suite in Room M576. The Neuropathologist on-call and the Neuropathology Fellow are paged to the suite when the resident is called from the O.R. to retrieve a frozen. It is very helpful to include the Neuropathology rotating residents and visiting fellows, but may not be practical for all frozens. The role of the neuropathology fellow is to help the resident during frozen, so do not hesitate to ask for help or questions. If you have any doubt or question, please ask before you do anything.

We need a smear and a frozen section slide for most effective intraoperative consultation decisions and you should be familiar with both of these procedures. All fellows and residents should be PROFICIENT in doing both.

Important: The resident always makes sure that there is sufficient material for permanent sections for diagnosis. Subsequent samples from the patient may not be from the lesion, or still too small for diagnosis. It is imperative to communicate the nature of the specimen to the attending neuropathologist and to the surgeon for assessment of adequacy.

Stereotactic biopsies:

Stereotactic biopsies should be processed differently from excisional biopsies or resections. These are virtually needle biopsies of the brain. This means you should know when the procedure is a stereotactic biopsy. These biopsies are small samples and should be handled with extreme care. The primary goal of the stereotactic biopsy is to provide a diagnosis for further management. The biopsy should be evaluated intraoperatively to determine sample adequacy, and to provide a preliminary diagnosis. Never forget to keep sufficient sample for permanent sections. You have the option of doing a smear only or smear and freeze a tiny portion but always check with the attending before doing anything.

DO NOT FORGET, a stereotactic biopsy procedure looks like a regular surgical process unless you notice the stereotactic frame in patient's head or ASK! Typically, the patients are awake in such procedures.

Grossing Tumor Specimens:

It is critical to adequately document the gross features of the specimen from neurosurgical procedures and important to record the number of tissue fragments in gross description. ALWAYS CONSIDER photographing a specimen (if intact) before hacking into it. Almost none of the specimens in neuropathology require using ink, so do not automatically use tissue ink. It is important to attempt to submit the entire specimen if possible since most CNS tumors demonstrate significant heterogeneity. You can comfortably submit up to 10 cassettes in a tumor and consult with the service attending

for cases that have more tissue. Non-neoplastic tissue may not require the same vigorous sampling. Remember to always ask a neuropathology attending before proceeding and always consider the possibility of putting away tissue for special studies such as electron microscopy or genetic analyses.

Neuropathology Signout Sessions:

Typically, the residents are expected to review all the slides of the case, form an opinion and write a preliminary diagnosis. They need to be prepared to give an adequate microscopic description of the case addressing the most pertinent aspects of each case. You should be familiar with the most pertinent features of a particular entity and to decide whether these features exist in that specific specimen. During sign-out, you are expected to make comments, and this is as important as correctly diagnosing the case.

The neuropathology sign-out sessions take place at the service attending's multiheaded scope or in room M557 around 3-3.30 pm every day. While this should be the rule, exceptions are often tolerated if the resident communicates in advance with the service attending and if all involved (fellows, visitors, etc) can adjust their schedules. You should remember that everyone involved in the sign-out process need to adjust their schedules and re-scheduling may not always be possible.

You should come to the sign-out prepared:

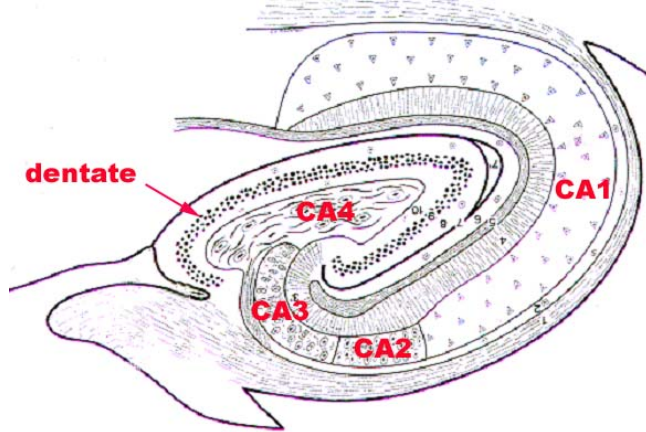
1. Be aware of the pertinent clinical and radiological information for all tumor cases
2. An general idea of the possible diagnostic options
3. Willingness to describe what you see in the microscope.

It is critical for the resident to keep a good record of the special stains, immunohistochemistry and other additional tests ordered for cases. Reviewing these stains is crucial to make the correct diagnosis and completing the pathology report is of utmost priority. However, once the case is completed and the neuropathology attending signs out the case, you can ask to review the slides and the information at your pace. Once completed, please return the slides to be filed (either back to the fellow or to Angela Mok). Please review these cases as efficiently as possible and return them to the appropriate person for filing

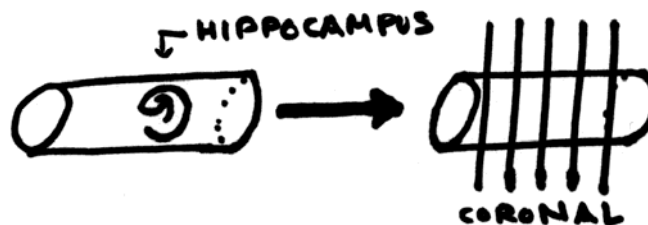
ASK IF YOU HAVE ANY QUESTIONS AT ANY TIME!!

Reporting of Temporal Lobe Resections for Seizure Disorders:

Temporal lobe resections are often performed for the purpose of controlling seizures emanating from this region. The correct orientation and reporting of these resections are **critical** to diagnosis and subsequent management of patients. There is a optional form for reporting and processing temporal lobe resections for seizures. The form is accompanied by a set of directions for grossing these specimens. These documents can be found in the public drive within the NEUROPATHOLOGY Folder titled as "Seizures". Most temporal lobe seizure specimens contain 4 parts: 1-lateral temporal cortex, 2-temporal lobe, 3-amygdala, 4-hippocampus. Ideally, one should orient the hippocampus specimen if possible. This is best done with the help of the neurosurgeon or attending neuropathologist. It is also helpful to identify the ventricular surface that is often much shinier than the rest of the specimen. Cortical surfaces can also be easily identified. Coronal sections through the hippocampus will better visualize the entire anatomy microscopically (as shown below) in order to assess neuronal loss in the critical areas (dentate gyrus and Cornu Ammonis (CA). The specimen from the hippocampal formation should be entirely submitted.



The hippocampal specimen may look like a three dimensional tube, which you can section serially (see below). The smooth, shiny aspect corresponds to the ventricular surface, which can aid in orientation.



PROCESSING MUSCLE/NERVE SPECIMENS AT OFF HOURS

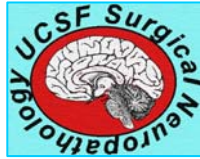
Typically, you will not process the skeletal muscle and peripheral nerve biopsies received at work hours but you should be familiar with the procedure

Skeletal Muscle Biopsies on Evenings and Weekends:

1. Accession the specimen as an NP case.
2. Examine specimen. They are normally received fresh. Measure and record dimensions and weight for the NP fellow.
2. Place a tiny sliver (~0.2 x 0.1 x 0.1 cm) in chilled glutaraldehyde and store in the refrigerator.
3. If enough tissue is available (>0.3 gm), submit a small cross-section for formalin-fixed, paraffin-embedded sections. This is particularly important if a vasculitis or inflammatory myopathy is suspected. Choose fattier/more cauterized or otherwise distorted portions for formalin-fixation. Always save the best material for frozen section histochemistry.
4. If the specimen comes with some indication that the muscle biopsy is being done for metabolic, mitochondrial or biochemical workup and the specimen is >0.4 gm, snap freeze a small portion in liquid nitrogen without OCT and store this in the minus 80 centigrade freezer located in the gross room.
5. Wrap remainder in saline-moistened gauze that has been completely wrung out (no free saline should contact the specimen or severe freezing artifacts will arise) and store in the fridge.
6. Be sure to save the best material for frozen section histochemistry.

Peripheral Nerve Biopsies on Evenings and Weekends:

1. Accession the specimen as an NP case.
2. Nerves are normally received fresh. Examine the specimen. Be careful to handle it by the ends and avoid bending it, if possible. Measure and record dimensions and appearance.
3. Obtain razor blade from frozen section cutting station and remove the cardboard wrapping. Make a narrow trough with the cardboard and gently drape the nerve into the trough. This provides just a little bit of tension on the nerve while it fixes. Fix the specimen on the cardboard in chilled glutaraldehyde, in the refrigerator.
4. Alert the neuropath fellow on Monday morning and s/he will take care of it.
5. In cases where there is serious consideration of metabolic disease, it is best to contact the first year Neuropathology fellow to discuss appropriate processing:



ATTENDANCE RECORD (*required if a record of this rotation may be needed at any time in the future*):

Please use this page to keep track of the cases you have observed or reviewed during your rotation. It will also remind you to observe the diverse number of topics/lesions we see in neuropathology. It will also help you during your pathology board application. Please give a copy of this page to Neuropathology Administrator.

Name: _____

Current Position: _____

Rotation period: from ___/___/_____ to ___/___/_____

The number of cases reviewed= TOTAL _____

#Surgical / Consultation cases observed at sign-out: _____

#Frozen sections reviewed/observed _____

#Neuropathology Autopsy observed: _____

#Nerve/muscle biopsies observed at sign-out: _____

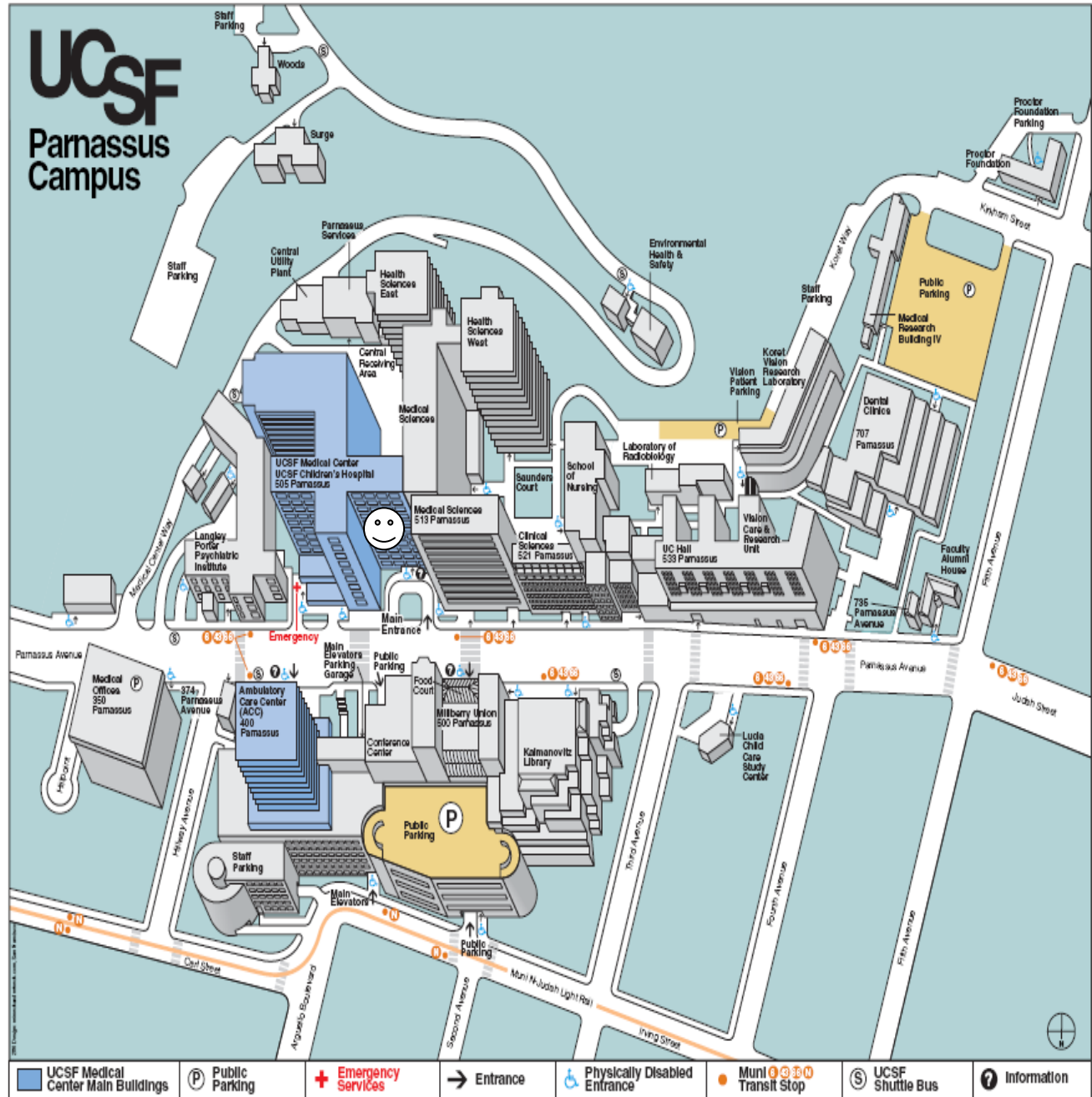
#Teaching set cases reviewed: _____

#Specialty sets/project cases reviewed: _____

The number of conferences attended (approx.)= TOTAL _____

Note: The numbers can be estimates

<p>Contact Information (mail address, phone, email):</p> <p>_____</p> <p>_____</p> <p>SIGNATURE: _____</p>



Ambulatory Care Center (A)
400 Parnassus Avenue

**UCSF Medical Center
UCSF Children's Hospital**
505 Parnassus Avenue
• Long Building (L)
• Moffitt Building (M)

Central Utility Plant
25 Medical Center Way

Clinical Sciences Building (C)
521 Parnassus Avenue
• Dental Clinics

Dental Clinics Building (D)
707 Parnassus Avenue

Environmental Health & Safety (EHS)
50 Medical Center Way

Faculty Alumni House (FA)
745 Parnassus Avenue

Health Sciences East (HSE)

Health Sciences West (HSW)

Kalmanovitz Library (CL)
530 Parnassus Avenue

Koret Vision Research Lab (K)
10 Koret Way
• Beckman Vision Center

Laboratory of Radiobiology (LR)
4 Koret Way

**Langley Porter Psychiatric
Institute (LPP)**
401 Parnassus Avenue

Lucia Child Care Study Center (CCC)
610 Parnassus Avenue

Medical Research Building IV (MR IV)

Medical Sciences Building (S)
513 Parnassus Avenue
• Cole Hall

Milberry Union (MU)
500 Parnassus Avenue
• Bookstore
• Conference Center
• Food Court
• Recreation & Fitness Center

Parnassus Services Building (PS)
30 Medical Center Way

Proctor Foundation (PF)
95 Kirkham Street

Public Parking (P)
• Main Parking Garage
(enter on Irving St. & 2nd Ave.
or on Parnassus Ave.)
• Dental Clinics Building Lot
(enter on Kirkham St.)
• Vision Patient Parking Lot
(enter on Kirkham St.)

School of Nursing (N)
2 Koret Way

Surge Building (SU)
90 Medical Center Way

UC Hall (U)
533 Parnassus Avenue
• Beckman Vision Center
• Faculty Practice Offices
• Toland Hall

**Vision Care &
Research Unit (VCRU)**
8 Koret Way
• Beckman Vision Center

Woods Building (W)
100 Medical Center Way

350 Parnassus Avenue
• Medical Offices
(leased, fee parking available)

☺ **WE ARE LOCATED IN MOFFITT BUILDING (M) 5th FLOOR, M551**