University of California
San Francisco

UCSF MEDICAL CENTER
DEPARTMENT OF PATHOLOGY
NEUROPATHOLOGY UNIT

SHORT-TERM VISITING FELLOWSHIP
ORIENTATION MANUAL
2016

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

Updated: February 5, 2016

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FACULTY

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SHORT-TERM VISITING FELLOWSHIP IN SURGICAL NEUROPATHOLOGY

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, and our Unit. For the purposes of this document, all individuals rotating in Surgical Neuropathology for 1-2 months are identified as Short-Term Visiting Fellows. ***Please contact the neuropathology administrative assistant (phone: 415-476-5236) for assistance with schedules or other questions. Also please complete page 14 and give a copy to your supervising neuropathologist.***

Welcome to Surgical Neuropathology!

The objectives of this rotation almost entirely depend on the individual and his/her aspirations. Nevertheless, we recognize four main categories:

1. ***To develop a fundamental understanding of Neuropathology practice and mechanisms of Neurological Diseases (mostly for medical students)***
2. ***To acquire the fundamental Neuropathological competencies for the practice of Pathology, Neurology, or Neurosurgery (mostly for pathology residents and residents of Neurology and Neurosurgery departments)***
3. ***To pursue a specific research project in Surgical Neuropathology.***

Pick yours!

Faculty and Staff Contact Information

PERSONNEL	Office	Phone	Pager	E-mail
Neuropathology Administrative Assistant				
Daren Le (temporary	M551	476-5236		*daren.le@ucsf.edu*
Faculty				
Arie Perry	M553	502-0821	443-6304	*arie.perry@ucsf.edu*
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Fellows				
Areli Cuevas-Ocampo	M-580	502-6604	443-3929	*Areli.Cuevas-Ocampo@ucsf.edu*
Giselle Lopez	M-580	502-6604	443-7991	*Giselle.Lopez@ucsf.edu*
Amber Nolan	M-580	353-8991	443-4711	*amber.nolan2@ucsf.edu*
Christopher Liverman	M-580	502-6604	443-6938	*christopher.liverman@ucsf.edu*
Important Phone Numbers				
Surgical Path Gross Rm	M576	353-1608	353-1608	
Electron Microscopy	S568	353-2673	353-1266	
Morgue	M55	353-1629	353-1629	

Schedule of Meetings & Conferences

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 AM			**8:30 AM** Neuro Autopsy/Brain Cutting **M55**	**M.O.D. Conference** **HSW 302**	
9:00 AM				Neuroradiology Conference **N729**	Muscle/Nerve Conference **M557**
10:00 AM	Monday Teaching Conference **M557** (Most Mondays)	Consensus/ Consultant Conference **M557**		Eye Pathology Sign-Out **U507**	
11:00 AM					
12:00 PM				**12:30 PM** Neuro Oncology Tumor Board **L33**	**12:30 PM** Pediatric Tumor Board **MB 4700**
1:00 PM					
2:00 PM					
2:30 - 5:00 PM	Neuropathology Sign-Out Sessions (ask for exact time & location)				

Note: There are many other conferences, lectures and meetings throughout the campus, please make sure to be informed of them.

Learning Objectives for Neurology/Neurosurgery Residents:

1. **Describe how the neuropathologist works**
2. **Describe what to expect from frozen section and when frozen section can be useful**
3. **Learn the grading and typing of brain tumors and learn about radiology/pathology correlation**
4. **Provide a brief description of the basic pathological patterns in nerve and muscle biopsies**
5. **List the spectrum of clinically relevant CNS infections and their specific histological features**
6. **Describe the principals of pathological findings in demyelinating diseases**
7. **List the fundamental pathological findings in common neurodegenerative diseases**
8. **Learn how autopsy neuropathology can help discovery, research and patient care**
9. **Recognize the basic images that can be encountered in the neurology/neurosurgery board exams**
10. **Improve your skills for inquiry and systemic review in neuroscience research.**

1. **REQUIRED READING: Practical Review of Neuropathology (Fuller, Goodman):** This is an excellent book for board review. Just browse the tables and the figures if you are pressed in time. In Dr. TIHAN'S OFFICE M551

Recommended Textbooks

2. **Practical Surgical Neuropathology (Perry & Brat)**: Our home based textbook and a great resource for signout.
3. **Diagnostic Pathology, Neuropathology (Kleinschmidt-DeMasters, Rodriguez, Tihan)** Another one of textbooks contributed by our home team members. Part of Diagnostic Pathology book series
4. **Neuroradiology Companion (Castillo):** This book is great for basic neuroradiology information. It is very helpful for medical students, pathology residents and neuropathologists. It is somewhat simplistic for rotating neurology or neurosurgery residents. In Dr. TIHAN'S OFFICE M551.
5. **WHO Classification of the Tumors of the Central Nervous System (IARC 2016; Eds Louis,Ohgaki,Wiestler,Cavenee):** This is the WHO reference book for classification and typing of CNS tumors. It is a great addition to the Neuropathologist's library. It is a good reference for Neuropathology fellows, pathology residents and is somewhat extensive for rotating neurology and neurosurgery residents. Multiple copies

Learning Objectives for Medical Students:

To develop a basic concept on the fundamental aspects of Neuropathology

1. How to perform a frozen section, intraoperative smear and how to proceed with an intraoperative consultation
2. How to approach a surgical neuropathology specimen and develop a general algorithm in making diagnosis
3. List the major groups of primary brain tumors, the concept of gliomas, grading and classification of most common tumors in the WHO scheme.
4. Define a list of useful stains to determine origin of tumors and correct diagnosis
5. List the most common entities in demyelinating disorders
6. List the basic lesion seen in cranial trauma, fractures, intracranial hemorrhages and herniations.
7. Describe the pathology of most common cerebrovascular disorders (aneurysm, malformations, ischemic/hypoxic encephalopathy)
8. List the most common (three of each) bacterial, fungal, parasitic and viral infectious agents
9. List the diagnostic criteria for most common neurodegenerative diseases (AD, PD, ALS)
10. Describe the 4 stages of neurodevelopment and four most common disorders at all four stages of neurodevelopment.
11. ***Observe the fun we have every day***

SUGGESTED READING: Manual of Basic Neuropathology (Grey, DeGirolami and Poirier) just ask our administrator to help you sign out the book!

Recommended Textbooks

1. **Practical Review of Neuropathology (Fuller & Goodman)**
   This is an ideal book to review the fundamentals of neuropathology for medical students. Especially the figures and tables are very useful
2. **Practical Surgical Neuropathology (Perry & Brat)**:
3. **Diagnostic Pathology: Neuropathology 2nd Edition (Kleinschmidt-DeMasters, Rodriguez, Tihan)**

Learning Objectives for Pathology Residents:

To master the basics of neuropathology practice and learn the most common disorders that can be encountered in daily surgical pathology practice

1. Learn how to perform and interpret frozen section and smear preparations
2. Describe the basic modalities of brain imaging CT and MRI
3. Effectively communicate with the Neurosurgeon and Neurooncologist
4. Diagnose and differentiate cavernous angioma and arteriovenous malformation and other common vascular pathologies including vasculitis.
5. Recognize gliosis and light microscopic appearance of reactive astrocytosis
6. Recognize, and grade meningiomas, gliomas, neuronal tumors, medulloblastomas, germ cell tumors and lymphomas
7. Recognize the most common 5 mistakes committed in surgical neuropathology and learn how to avoid them.
8. Recognize a macrophage-rich lesion on H&E (demyelinating or infarctive)
9. Learn how to diagnose AD, PD, Lewy body disease, and.
10. List the utility of the most common immunohistochemical stains.
11. Learn when electron microscopy is useful in Neuropathology.
12. Recognize and distinguish neurogenic and myopathic patterns in muscle biopsy, and learn the most common histochemical stains.
13. Recognize axonal and demyelinating neuropathy and use of thick sections
14. Correctly answer most common questions asked in Anatomic Pathology Boards
15. **Participate in the social activities and admire the fun we have in neuropathology**

REQUIRED READING: Practical Surgical Neuropathology (Perry & Brat): Our home based textbook

Recommended Textbooks

1. **Practical Surgical Neuropathology (Perry & Brat)**:
2. **Diagnostic Pathology: Neuropathology 2nd Edition (Kleinschmidt-DeMasters, Rodriguez, Tihan)**
3. **Surgical Pathology of the Nervous System and its coverings (Burger, Scheithauer, Vogel)**
4. **WHO Classification of the Tumors of the Central Nervous System (IARC 2016; Eds Louis,Ohgaki,Wiestler,Cavenee)**

Learning Objectives for Visiting Pathologists/Fellows:

Your objectives and your goals are entirely up to you. We will do everything we can to help you achieve whatever you would like to do. However, we want you to identify your objective so we can help you achieve them. Please fill out the objectives section below and pass it onto us so that we can follow up our progress in having you achieve your goals.

Name:_____

My goals are

1.

2.

3.

4.

5.

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 Pathology Administration by Christine Lin Phone: 514-3424)
Total number of cases=550

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

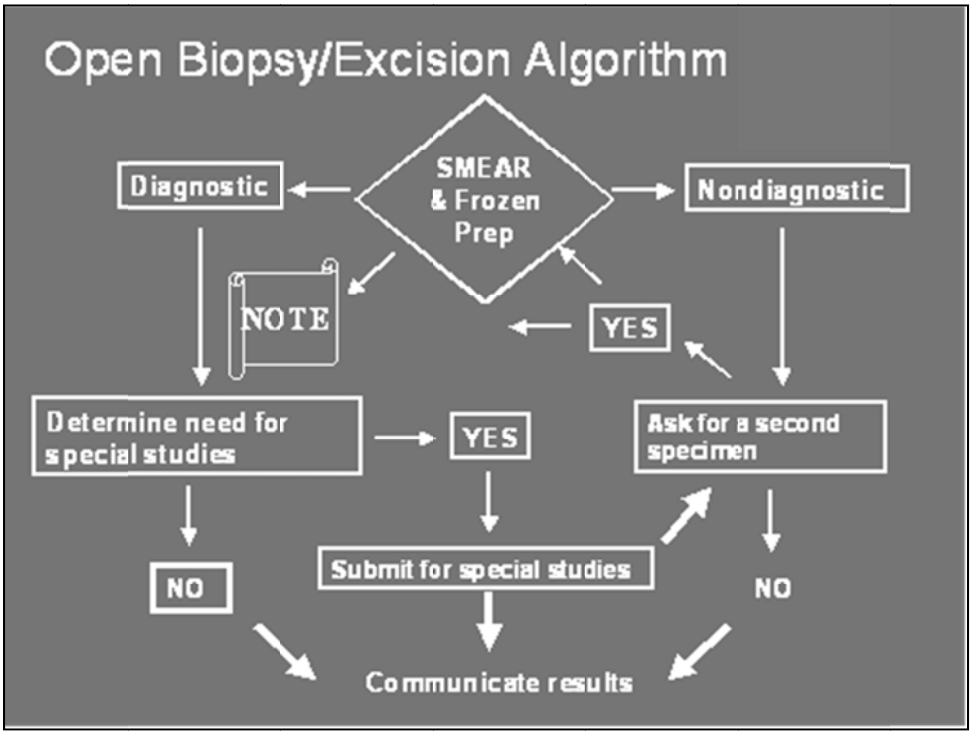
Located in the Residents' Room in M578, the slide set includes more than 1000 cases and covers most of surgical pathology excluding medical kidney and transplant pathology. To access the surgical pathology teaching set, please contact one of the chief residents.

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

1. **Practical Surgical Neuropathology (Perry & Brat)**:
2. **Diagnostic Pathology: Neuropathology 2nd Edition (Kleinschmidt-DeMasters, Rodriguez, Tihan))**
3. **Practical Review of Neuropathology (Fuller & Goodman)**
4. **Smears and Frozen Sections in Surgical Neuropathology (Burger)**
5. **Surgical Pathology of the Nervous System and coverings (Burger, Scheithauer, Vogel)**
6. **WHO Classification of CNS Tumors (Louis, Ohgaki, Cavenee, Wiestler, 2016)**
7. **Structural & Molecular Basis of Skeletal Muscle Disease (Karpati Ed.)**
8. **Pathology of Skeletal Muscle (Carpenter & Karpati)**
9. **Biopsy Diagnosis of Peripheral Neuropathy (Midroni & Bilbao)**
10. **Greenfield's Neuropathology (Love, Budka, Ironside, Perry)**
11. **Neuroanatomy through Clinical Cases (Blumenfeld)**
12. **Eye Pathology (Eagle)**

STANDARD PROCEDURES

1. Frozen section procedures: Frozen sections are performed at the Surgical Pathology Suite in Room M576. The Neuropathologist on-call is paged to the suite when the resident is called from the O.R. to retrieve a frozen. You can ask the pathologists' assistants to page you as well, but this has to be arranged individually since there is no strict obligation that you attend all frozen sections. It is very helpful to do so, but not practical for all rotators.
2. 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. Neuropathology fellows and Anatomic Pathology resident should be PROFICIENT in doing both.

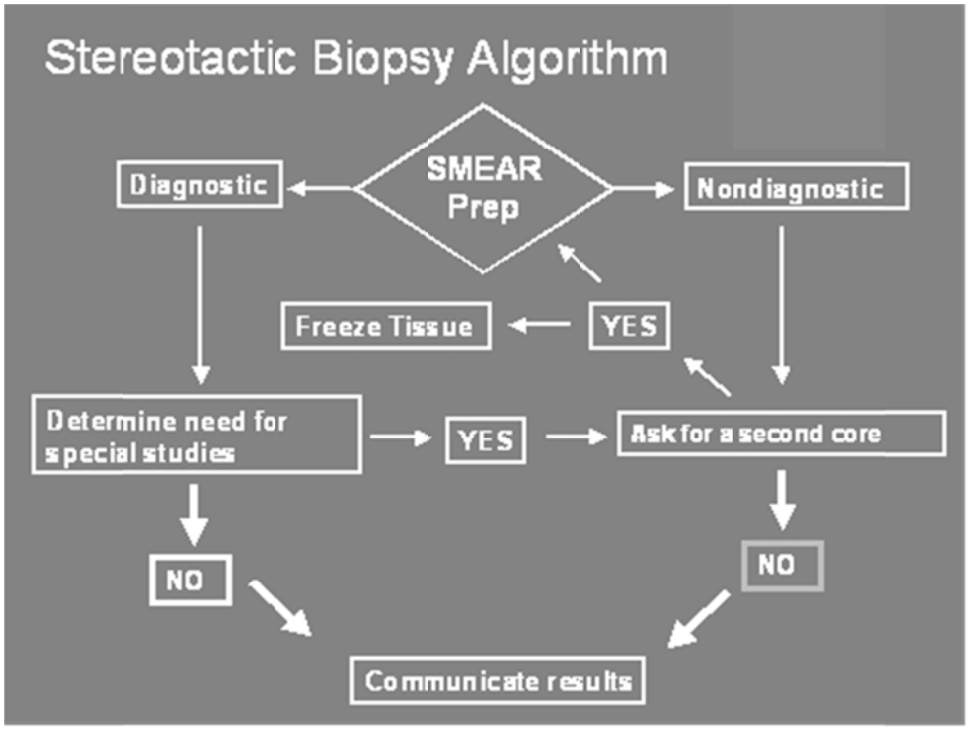


Note: Always make sure that you are left with sufficient material for permanent sections for diagnosis. Subsequent samples from the patient may not be from the lesion, or still too small for diagnosis.

Processing of Stereotactic biopsies:

Stereotactic biopsies are small samples and should be handled with extreme care. The primary goal of interpreting the stereotactic biopsy is to provide a diagnosis for further management. The biopsy should be evaluated using an intraoperative evaluation to assess sample adequacy, and to provide a preliminary diagnosis. You should always observe caution when processing these biopsies since the tissue is almost always limited. Never forget to keep a sample for permanent sections. You have the option of doing a smear only or smear and freeze a tiny portion but always check with your attending.

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.



Processing Muscle/Nerve Specimens (for Residents):

Muscle and Nerve 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.

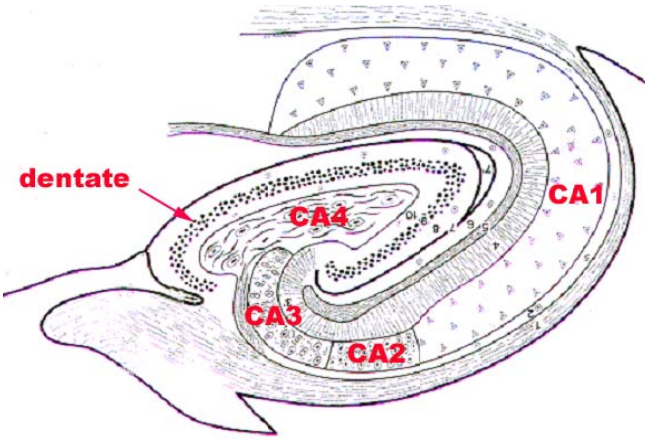
Nerves.

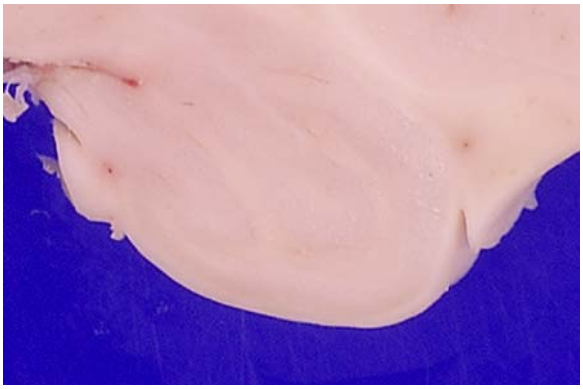
1. Accession the specimen as an NP case.
2. Nerves are normally received fresh. Examine the specimen. Be careful to handle it by the ends and avoid bending it, if possible. Measure and record dimensions and appearance.
3. Obtain razor blade from frozen section cutting station and remove the cardboard 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. Alert the neuropath fellow on Monday morning and s/he will take care of it.
4. In cases where there is serious consideration of metabolic disease, it is best to contact the Neuropathology fellow to discuss appropriate processing: 443-2693.

REPORTING OF TEMPORAL LOBE RESECTIONS

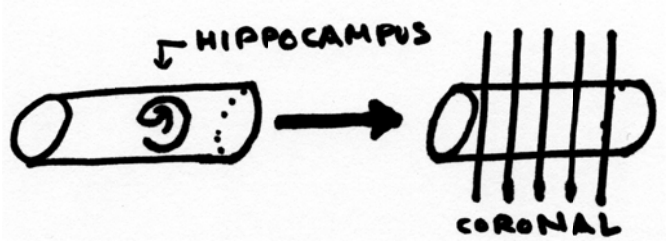
Temporal lobe resections are often performed for the purpose of controlling seizures emanating from this region. The correct orientation and reporting of these resections are **critical** to diagnosis and subsequent management of patients. There is a optional form for reporting and processing temporal lobe resections for seizures. The form is accompanied by a set of directions for grossing these specimens. These documents can be found in the I drive within the NEUROPATHOLOGY Folder titled as "Seizures". The form in the next page is also designed reporting of the temporal lobe resections (see page 14)

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. 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 may come as a three dimensional tube, which you would serially cross-section (see below). The smooth, shiny aspect corresponds to the ventricular surface, which can aid in orientation.



YOUR RECORD:

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. This document will also serve us to provide you with a record of your visit if requested. Please give a copy of this page to Linsi Matteson at the end of your rotation.

Name:_____

Current Position:_____

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

The number of cases reviewed= TOTAL _____

Surgical / Consultation cases observed at sign out: _____

Frozen sections reviewed/observed _____

Autopsy Brains observed: _____

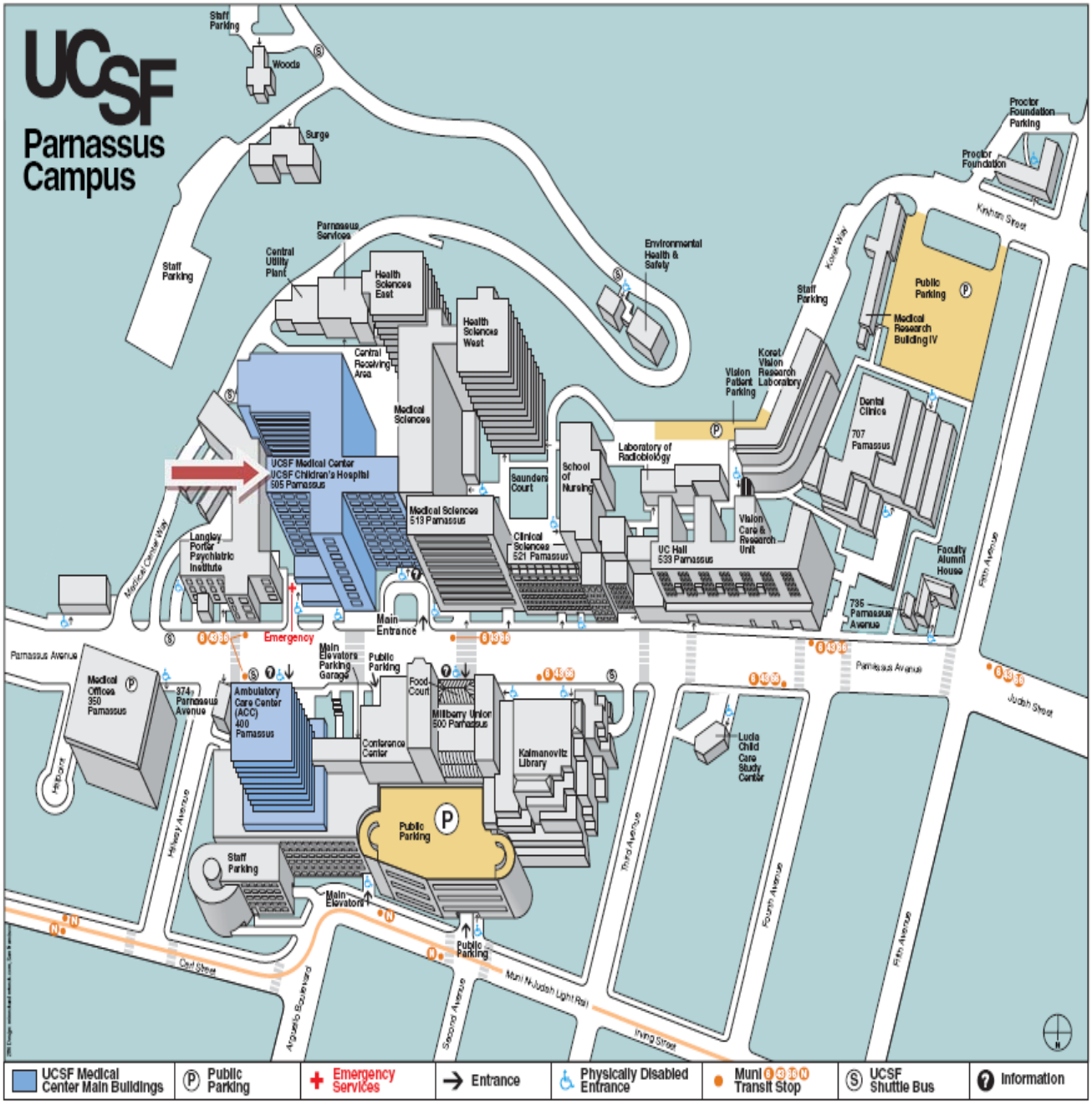
Nerve/muscle biopsies observed at sign out: _____

Teaching Set cases reviewed: _____

Specialty sets/Project cases reviewed: _____

The number of conferences attended= TOTAL _____

YOUR CONTACT INFORMATION (please also indicate where you want to send our final evaluation):



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 (LPPI)
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

Millberry 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