



**PENN STATE
COLLEGE OF MEDICINE**

MD/PHD PROGRAM

**STUDENT HANDBOOK
2014/2015**



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MESSAGE FROM THE STUDENT ORGANIZERS

Along with the MD/PhD program co-directors and our administrator Barb, we have put together this handbook to help you survive your eight years at Penn State. It contains information compiled from students and faculty, both former and current. We've included logistical info, tips on surviving each phase of the program, and information about applying to residency programs. We started this project because we found that much of this information is either difficult to find or is just acquired through experience. Because we are all altruistic angels, we did not want future students to encounter the same obstacles we faced or to repeat our mistakes. The road is long and challenging, but rewarding. We hope that the information in this handbook will make your journey a little easier.

We would like to thank the following students (alumni) and partners for contributing sections to this handbook:

Melanie Dispenza (organizer)
Vance Albaugh
Faoud Ishmael
JJ Rasimas
Bozo Todoric
Kimberly Lumsden
Stacey Clardy

A MESSAGE FROM THE CO-DIRECTORS

The mission of the Pennsylvania State University MD/PhD program is to prepare you to join the next generation of physician-scientists by engaging you in an environment that fosters intellectual curiosity, scientific rigor, and interdisciplinary collaboration while you acquire the fund of knowledge and skills needed to excel in research and as a compassionate physician. We pride ourselves on being available to you to provide guidance as you develop your interests and skills while meeting the challenges of physician scientist training. During the process, we encourage you to reach out to fellow students, faculty and trainees for advice, discussion, study groups, camaraderie, etc. Teamwork and mentorship is integral to success in both science and patient care. We hope that in turn through participation in our programmatic activities and in interactions with fellow students that you'll help to guide the students in the classes behind you. As MD/PhD students, the basic policies and procedures for the graduate school and medical school apply to you. We've designed the handbook as a reference source for your pursuit of the dual degree. We are excited to welcome you into our program and look forward to actively participating in your education, training and career development over the next few years as you transition from college graduate to resident physician and beyond.

Robert Levenson, PhD, Co-director
Leslie Parent, MD, Co-director
Barbara Koch, Program Administrator

AN OVERVIEW OF HERSHEY, PA

Hershey is a thriving resort town of approximately 20,000 in a metropolitan area of 400,000. It provides residents and visitors with the employment, cultural, and recreational opportunities that is attractive to people of all ages and walks of life.

Central Pennsylvania's second largest industry, [Hershey Foods Corporation](#), is headquartered in Hershey. What today is known as Hershey once was a small settlement called Derry Church. After Milton Snavely Hershey founded his chocolate factory and began building the community, the town was renamed Hershey. The saga of Milton Hershey is one of failure, success and philanthropy. He grew up a poor farm boy, became a millionaire from his caramel business and subsequent chocolate empire, and devoted his personal fortune to the welfare of needy children. His legacy includes two corporations, a model community, and a school that cares for more than 1,100 disadvantaged children.

The fourth largest is Penn State's Milton S. Hershey Medical Center, which provides jobs for more than 6,950 area residents. Tourism is another major industry, and Hershey Entertainment and Resort Company (HERCO) provides recreational and employment opportunities at [Hersheypark](#) and [ZooAmerica](#). Hersheypark is one of the country's top theme parks featuring rides such as the Wildcat, Splashdown, Tidal Force, and much more. ZooAmerica, North American Wildlife Park, is home to over 200 animals that represent more than 75 species. The Giant Center is the home of the [Hershey Bears](#) hockey team and is host to many top-name entertainers.

In addition to the many attractions in the Hershey community, the surrounding area is a wealth of historical and family entertainment. Harrisburg, Pennsylvania's state capital, is the location of many cultural attractions, including the State Museum of Pennsylvania, the Senators baseball team on City Island, the State Library of Pennsylvania, the Museum of Scientific Discovery, and the Pennsylvania State Archives. Lancaster County has tours of authentic Amish farm life. The Heritage Center of Lancaster County has unique artifacts from the 18th and 19th century depicting the culture of the area and offers a historic walking tour with guides dressed in colonial attire. Gettysburg, 49 miles from Hershey, is the home of the Gettysburg National Military Park with monuments and cannons along miles of winding roadway silently marking the site of this decisive Civil War battle.

GETTING STARTED

IMPORTANT RESOURCES

MD/PhD Program Office

<http://www.pennstatehershey.org/web/mdphd/home>

Located in the Clinical and Translational Science Institute Suite, in C1742C (across from Au Bon Pain), the MD/PhD program office is where Barb Koch's office is located (phone extension x1188). Barb is the MD/PhD program administrator - she is essentially an office of one and handles everything related to the program. If you have a problem, odds are that Barb can fix it. She is the only person on Earth who knows all the details about the medical and graduate schools and how our program fits between them. Barb encompasses all things awesome, and without her our program would likely fall apart.

Medical Student Affairs Office

<http://med.psu.edu/web/md/studentaffairs>

The Medical Student Affairs office is located in C1712. This office includes the Financial Aid Office and the Registrar. They handle issues such as grades, transcripts, graduation requirements, USMLE exams, M3/M4 elective clerkships and away rotations, the laptop program, student life, etc. You will have several contacts in this office during M3/M4; more information is given in the M3/M4 section in this handbook.

Office of Medical Education

<http://www.pennstatehershey.org/web/md/home>

Located in C1704, this office takes care of everything related to your medical school coursework. Elizabeth Hamen, the pre-clinical curriculum coordinator, will be the one sending you emails about your M1/M2 class schedules and exams. Brian Herman, the clinical curriculum coordinator, coordinates the Island weeks, Transition to Clinical Medicine course and scheduling for M3/M4 clerkships.

Graduate Student Affairs Office

<http://www.pennstatehershey.org/web/gsa/home>

Located in C1802, this office takes care of everything grad-school related. In this suite you can find Kathy Simon (x6608), the administrator for the graduate school. Dr. Verderame, the Associate Dean of the Graduate School, has his office located in this suite as well. These two people are fantastic advocates for the graduate

students and are incredible resources that you should utilize. Remember that you should also refer to your specific graduate program secretary/office for information on your PhD requirements. *More on that later.*

Other Helpful Websites:

Penn State eLion (for tuition, bursar, grades, and course registration)
<https://elion.psu.edu/>

Penn State ANGEL (for all course materials)
<http://www.angel.psu.edu>

STIPENDS

All MD/PhD students receive a stipend both in graduate school and medical school which will be directly deposited into the account students designate during orientation. During medical school years, this stipend will come from the MD/PhD Program budget. During graduate years, stipends are paid by the thesis advisor. Appointments are made August 1 through July 31. During the last year of medical school (M4), MD/PhD students are paid until they graduate in May.

If you want to view your monthly stipend statement or change direct deposit settings, you can go to the Penn State Employee Self-Service Information Center (ESSIC) web site (<https://ohr.psu.edu/essic/Logon.cfm>) and use your epass ID and password to access the information.

STUDENT INSURANCE

Health Insurance

All students are required to carry health insurance and are automatically enrolled for single student coverage each year in all 3 (health, medical & dental). During the medical years, the MD/PhD Program will pay 100% of the cost of the 3 insurances (health, dental & vision). During graduate years, students will be required to pay 20% of the cost, which will be taken directly out of your stipend; your advisor funds will cover the remaining costs. Health insurance is also available for spouses and children. Insurance plan information is distributed to all students at the beginning of each fall semester. For more information, see the Graduate Student Affairs website:

<http://www.pennstatehershey.org/web/gsa/home/studentresources/insurance>

If a student has their own carrier or are on their parent's policy, no reimbursement will be given. If not taking the Graduate Assistant/Fellowship Plan, a waiver form must be filled out online in the Graduate Student Affairs website. If you do not participate in the school-affiliated program, you are required to show proof of equivalent insurance coverage on the waiver application form.

Eye and Vision Insurance

Students have vision coverage through National Vision Administrators (www.e-nva.com). Eye insurance costs are covered in the same way as general medical insurance.

Dental Insurance

Students have dental coverage through United Concordia (www.ucci.com). Dental insurance costs are covered in the same way as general medical insurance.

Disability Insurance

Students are required to carry disability insurance for themselves during their medical school years. Students will need to pay this at the Bursar's Office (Room C1607) and can bring the receipt to Barb Koch in the MD/PhD office. For 2013/2014, the cost is \$48.00.

STUDENT HEALTH

www.hmc.psu.edu/studenthealth/

Fishburn Clinic

General health care is available to all students and their immediate dependents through Student Health Services located at the Fishburn Road office. Hours of operation are Monday through Friday, 8:00 - 4:30. In order to schedule an appointment in Student Health, call extension x5998 to speak to Janice Mesarick, the secretary. Identify yourself as an MD/PhD student or student family member every time you call for an appointment. If you become ill on an evening or weekend when Student Health is closed, page the Family and Community Medicine on-call physician through the hospital operator at extension x8521.

Counseling

Dr. George Blackall has joined the Student Affairs Office as a counselor for students. He is available to help students with a variety of issues, including but not limited to stress and anxiety during school, depression, sexual harassment, family issues, personal issues, thesis advisor issues, and career choices. Appointments can be made by calling extension x6148 or emailing him at gblackall@psu.edu. Dr. Blackall's services are free for students. Everything you discuss with Dr. Blackall is completely confidential – no one, not even the course directors, will have access to your file without your permission. If you have a significant problem weighing on you, or you just need to talk to someone, don't hesitate (or feel weird) about talking to Dr. Blackall. He is easy to talk to and has helped many students. If he can't help you, he can find out who can.

Required Immunizations

All entering medical students are required to have a complete history and physical examination by a student health physician prior to matriculation. It is very important to have updated immunizations for infections you are likely to be exposed to as a health-care provider. All required immunizations and titers must be completed and submitted prior to arriving on campus. Students who have not met these requirements will not be able to start classes.

STUDENT FEES

Student Activity Fee

All students, both graduate and medical, are responsible to pay an annual \$44.00 student activity fee. This fee is collected to help defray the costs of student sponsored graduation activities and Student Assembly events. During medical years, the MD/PhD Program will reimburse the students for this fee. During all years, it is the student's responsibility to pay the fee via eLion.

Information Technology Fee

Students must pay the Information Technology fee for each *semester* in the via eLion. The MD/PhD Program does not reimburse students for this fee. For the 2013/2014 school year, the fee is \$323/semester.

LIBRARY RESOURCES

<http://www.pennstatehershey.org/library/>

Penn State Hershey's Harrell Library is open to students 24 hours a day and offers a variety of resources to students. You should get familiar with what the library has to offer, because it will be a great help to you during your years in the MD/PhD program. Many resources can be accessed through the library website listed above, or by directly asking the library staff (they are very helpful!). We have outlined some of the resources below. In later chapters of this handbook, we have also listed some library specific resources that are useful for individual classes or clerkships.

Textbooks

The library circulation desk holds copies of all of the required and recommended textbooks for classes plus many others. Required textbooks can be checked out for a few hours at a time. There are numerous other textbooks as well that can be checked out for a semester at a time. Sometimes a required textbook has an older edition that you can check out for a whole semester.

Online Books

The library has over 10,000 eBooks for your use. A few of the big ones are listed below:

Harrisons Principles of Internal Medicine

The classic textbook for internal medicine, *Harrison's* is useful for all stages of medical school, but you will generally use it more as a supplementary reference rather than a book that you read cover-to-cover. You could buy the paper book version (~\$150), but the entire text is free online for Penn State students. The online version is easy to navigate and contains information on nearly every medical condition known to man.

Robbins and Cotran Pathological Basis of Disease

Shortened to just “Robbins” among medical students, this textbook will be one of your primary resources during M2 and beyond. The eBook is available for students for free through the library website, but most students end up purchasing the textbook because they use it so much.

Online Medical Databases

The library has access to over 200 databases that cover nearly all fields and specialties (<http://apps.hmc.psu.edu/elibrary/Database>). Below are some of the most useful:

Up To Date

Up To Date is a fantastic resource for accessing the latest evidence-based information on disease pathogenesis, treatment, and patient management. It combines primary research information on into concise summary articles, which makes it easier to use for reading about diseases than PubMed would be. Aptly named, information in Up To Date is updated every four months, and recommendations change as new research is published. The majority of students use Up To Date for PBL cases, and many also use it on the wards (we've had physicians in the clinic ask us to look up topics on Up To Date to be sure that they are treating their patients with the best knowledge available). Up To Date is also available off-campus through remote access.

DynaMed

DynaMed is an online reference tool created for use primarily at the ‘point-of-care’ with clinically organized summaries of over 3,200 topics. Much like Up To Date, DynaMed is useful for researching individual cases on the wards during M3/M4 and for PBL during M1/M2 (more on what “PBL” is later). DynaMed is accessible on campus through the library website, but off-campus access must be done through this link (<http://medjournal.hmc.psu.edu:2139/dynamed/technical.php>) – be sure to ask the library staff for the key for off-campus access. There is also an app for smart phones.

Micromedex

Micromedex is especially useful for information on drugs: pharmacology, evaluations, dosages, interactions, and toxicity. Micromedex is also useful for information on laboratory tests, and includes dosage calculators. Micromedex access off-campus (<http://www.thomsonhc.com/hcs/librarian>) is especially useful for M3/M4 clerkships. There is also a smart phone app available.

Online Journals

Primary literature will obviously be a major resource for you during your grad years, and possibly also in your medical years. Penn State has subscriptions to over 5,200 medical and scientific journals. If you access PubMed or OVID from any Hershey Med computer (or off-campus through the library website), you will have free access to all of the journals that Penn State subscribes to. There are multiple ways to access these journals. The Library website has an alphabetical list that you can search or browse. Alternatively, to determine if a specific article is available for free through Penn State, pull up the article abstract on PubMed. If the full text is available, you will see a little blue Penn State icon at the top right of the abstract page – clicking on the icon will take you directly to the full text of the article on the journal’s website. If Penn State doesn’t subscribe to the journal, the library may be able to find the article through inter-library loan. Inter-library loan can get usually get articles for free, but sometimes there may be a small charge.

Computer Lab

Computers for student/faculty use can be found both downstairs in the central area as well as upstairs in a computer lab. Since Penn State requires all incoming students to have a laptop, you may not need to use these computers much. These computers do come in handy when you need to use a certain software program that you don’t want to purchase on your own. For example, the library computers have some statistical and graphing programs that may be useful during your PhD years. The library computer lab also has several scanners available for student use.

Computer Classes

The Library offers many computer classes free of charge to students and employees. These classes are especially useful resources for learning how to use certain software programs (such as EndNote or Photoshop) or learning how to efficiently perform a PubMed literature search.

Printing

The Library has printers available for use by students and faculty and charges for printing by the page. You are encouraged to use your lab’s or graduate

department's copier/printer during graduate years.

Mobile Resources

The Library is extremely helpful in providing medical students with clinical resources for PDAs or smart phones. Most students have a PDA or smart phone for use in the clinics. Although you don't really *need* a smart phone, think of it this way: the more apps you have on your phone, the fewer books you need to carry in your white coat pocket! They are easily accessible resources to look up drugs, calculate labs, or read about diseases. There are many useful medical apps out there; we've listed some below, but be sure to check out library website for more information about mobile technologies:

<http://med.psu.edu/web/library/technology/mobile>

Useful medical apps:

- ***Epocrates*** (subscription is free for PSU medical students - see the library for details)
- ***Medscape*** (great for diseases and pathology, also has drug info)
- ***Dynamed*** (get key pass from library)
- ***MicroMedex*** (great drug database!)
- ***LexiComp Online*** (another great drug database and also lists the HMC formulary. See <http://infonet/pharmacy/> to get the access code)
- ***Unbound Medicine UCentral*** (subscription is free for PSU medical students - see the library for details)
- ***Medical Eponyms***
- ***Archimedes calculator***
- ***Diagnosaurus***
- ***Qx Calculate***

We've put the most highly recommended apps in bold. There are many others beyond this list, and many programs that are fantastic that must be paid for (such as the *Netter* atlas and the *5 Minute Clinical Consult*). You have to decide for yourself if a smart phone is worth the money.

SIMULATION LAB

Penn State has an extensive Simulation Lab where students and residents can learn how to perform medical procedures on mannequins. You will use the Sim Lab a few times in M1/M2. For example, you will learn heart sounds on a mannequin in M1 (and again in M3). Before M3 in the Island Week, you will use the Sim Lab to learn how to do a pelvic exam, place IVs, draw ABGs, and other procedures before you practice on patients. Outside formal class times, students and residents can use the Sim Lab at any time to practice procedures, though we recommend that you let one of the Sim Lab staff show you how to use the equipment for the first time. We won't go into details here, but there are a lot of very cool toys in the Sim Lab; you will learn about them more during your classes.

MD/PhD PROGRAM ACTIVITIES

MD/PhD Annual Retreat

Every year, the students and faculty attend an overnight retreat held at an off-campus site. Organized by the student Retreat Team, the agenda includes student speakers, a guest speaker, panel discussions, etc. The retreat is no cost to students; the program will cover your overnight stay and meals. The retreat is mandatory attendance for all students. Any student unable to attend must notify the Co-Directors of their reason for not attending.

MD/PhD Interview Days

The MD/PhD program interviews applicants on four or five days each year. All students are required to participate in the interviews days whenever necessary and whenever their schedules permit. Barb and the Recruitment Team members will contact students to participate in interview events on both Sunday and Monday. Barb will also ask for volunteers at the beginning of the interview season for hosting applicants. Reimbursement will be made for any meals or related expenses when hosting an applicant.

MD/PhD Seminar Series

The MD/PhD Seminar Series was created to enable students to learn the research projects of each other and get to know each other better. Advisors and MD/PhD Steering Committee members are also invited. The yearly schedule includes seminars given by G3/G4 students, at least one alumni speaker, two in-house physician scientists, and a few discussion meetings on subjects suggested by

students. Seminars are held the second Thursday of the month from noon to 1:00 pm (location varies; some are video-conferenced from main campus). Seminars are mandatory attendance for all MD/PhD students (sign-in sheet required). M3 and M4 students should contact Leslie Parent to notify your preceptor that you will be away from the clinic/wards for the hour. Or, if you will be off-campus for a clerkship, let Barb know that you cannot attend. All other students must request permission from one of the Co-Directors to be excused from a seminar.

Occasionally, other department seminar speakers that are physician scientists are able to meet directly with MD/PhD students for lunch. Barb will contact all MD/PhD students with those dates and times to meet with speakers. Even if you are not interested in the speaker's research, it is good to meet them to ask questions about their experiences as a physician scientist. Attendance at these meetings is voluntary but highly encouraged.

MD/PhD Clinical Research Conferences

The CRC was started in February 2013 to strengthen vertical integration between the MD/PhD students and to interact with other students and faculty. A clinical case will be presented by a student followed by an introduction to the clinical topic, background history and a pathophysiology of the disease. Presentation of a related translational research article is then discussed followed by a brief presentation by the mentor. 3 students volunteer for the first part and choose a mentor and a topic. CRCs are held from 5:00-7:00 pm every other month (including dinner from 5:00-5:30) on the second Thursday. Attendance is required for all students regardless if they are on or off campus.

Students located off campus

Attendance is required at Seminars, Retreat and Clinical Research Conferences. When Seminar and CRC fall on the same day, physical attendance is required. Carpooling is highly suggested and reimbursement will be given to the driver for round-trip mileage. No mileage reimbursement will be given to attend the Retreat or committee meetings. For Seminars without CRC, attendance via Adobe Connect is required.

STUFF YOU NEED TO BUY

Laptop

Penn State now requires all medical students to purchase their own laptop

computer for classes. For more information about laptop requirements and software, see (<http://www.pennstatehershey.org/web/md/home/accepted/laptop>) You can purchase Dell laptops and various software at discounted prices through the Penn State Computer Store (www.computerstore.psu.edu). If you purchase your computer through the Penn State program, they will take care of formatting it and keeping your anti-viral software up to date.

Medical Instruments

The medical school currently ‘requires’ all students to purchase their own stethoscope, otoscope/ophthalmoscope, reflex hammer, and tuning fork. If you want to go nuts, you could buy other equipment like a blood pressure cuff, microfilament, etc – these may be useful if you want to practice on your own, but you won’t need these for class or the wards. You do *not* need all your medical instruments immediately when M1 begins, so take some time to find good prices. Some medical classes will get group deals on stethoscopes from individual manufacturers.

Stethoscope: In the words of Dr. Zelis (who teaches in the cardiology block), it’s not what you have, but how you use it! In other words, all stethoscopes are essentially the same. The vast majority students purchase the Littman Cardiology III (available for about \$140). Other good choices include: Harvey Elite, ADC Cardiology and Littman Master Cardiology.

Otoscope/ophthalmoscope: An otoscope/ophthalmoscope diagnostic kit is required for Island weeks (more about those later). This is the most expensive piece of equipment you will buy (it can run for a few hundred dollars). Some students buy their own, but many students share these too. You can get away with borrowing one from another student for Island weeks, and most clinic exam rooms in the hospital have one. There is only one manufacturer to pick from here (Welch Allyn) so the main choices are: pocket-sized or full-sized kit. Some say the pocket models are more difficult to learn on. However, the full-size models are heavier to carry in your white coat on the wards, which means that you probably won’t carry it at all. You do not need to purchase your ophthalmoscope right away. The medical school usually arranges to have a representative from Welch Allyn give the M1 class a presentation describing the options; they usually offer discounts around the time of the presentation as well.

Tuning fork: There are three types of forks: high, middle, and low frequency models. Save some money; you only need the middle (256 Hz) model. You may not use this at all until your Neurology clerkship in M4.

Reflex hammer: The normal (cheap) triangular headed hammer is all that's needed. You will use this more than you might imagine on the wards.

Textbooks

Textbooks are obscenely expensive nowadays. If you buy every book, you could easily spend thousands of dollars on books during medical school. Fortunately, you don't necessarily have to buy books for all your classes. Some general guidelines for textbooks are outlined here, but recommendations on specific books for each class can be found in the M1/M2 Section.

For M1/M2, all testable material will be in the lecture powerpoints. It is up to you to determine how much you really need to read in addition to the class notes in order to pass the exams, but remember that in a way, during M1/M2 you are also studying for Step 1 of the USMLE. Some classes in M1/M2 have required textbooks, and most have 'recommended' textbooks. Some of the course directors give recommendations for reading outside the lecture powerpoints. In M2, courses are system-based. Thus, the textbooks for M2 courses are smaller in volume and more focused in information (and thus a little cheaper than the M1 books). Many students find it useful to purchase one textbook per block in M2.

For M3/M4, there are no required textbooks for clerkships, though most clerkships will recommend some sources for studying. You will use a variety of resources to read about individual patient cases, but review books will be your mainstay for studying for the shelf exams and the USMLE Step 2. Many students purchase one review book for each core clerkship, and then use them for USMLE Step 2 studying as well.

All required textbooks are available for short-term loan through the library, and many books and databases are available for students for free online through the Penn State library website (see Library Section). Browse the free online resources on the Library website before you buy any textbooks – for example, *Harrison's* is available online, so you might not need to spend \$150 on a paper copy.

More information about which particular books are useful for each M1 or M2 class can be found in the M1/M2 chapter of this guide. Please keep in mind that the books listed in this handbook are only suggestions, and book and study preferences differ from one student to the next. Wait a day or two into each course to decide what textbook (if any) will benefit you the most.

The MD/PhD Program office has quite a few used textbooks that graduates have donated. Please visit the office and look through them before purchasing a book. Students are welcome to borrow or keep any books they wish to.

FINANCIAL PLANNING

Just because we get stipends doesn't mean that we don't have to plan financially for the costs of medical school. Unless you have a spouse who has a real job, you may find that you need to start saving or take out loans to cover the costs of applying and interviewing for residency. Or maybe you will want to start a family or buy a house during this time (both are very doable during the program). For information about financial planning and loans, see the Financial Aid website (<http://www.pennstatehershey.org/web/md/financialaid>). Below you can find a general guideline for expenses you can expect during medical school.

Estimated Costs

Below are some *estimated* school-related costs you should plan ahead for. For simplicity, the costs of medical/dental/eye insurance are not included on this list because they are either fully covered (medical years) or the costs are automatically taken out of your stipend (grad years). More information on each of the items below can be found elsewhere in this handbook; this is just an estimate of the costs.

Laptop	\$1,000
Student Fees	\$727.60 per med school year
Textbooks	
• Textbooks for M1/M2	\$300 to \$2,000
• Review books for M3/M4	\$200 to \$1,000
Medical equipment	\$450
Away rotations (optional)	\$500 to \$2,000 for housing
Residency applications	
• ERAS	\$750
• Rank list	\$300
• Interview suit	\$500 (get a nice one)
Travel/lodging for interviews	\$2,000 to \$12,000 (really!)
USMLE Exams (fees as of 2013)	
• Step 1 fee	\$560
• Step 2 CK fee	\$560

- Step 2 CS fee\$1,200
 - Travel/lodging for Step 2 CS (Depends on location)

Total. \$10,000 to \$25,000

Taxes

All MD/PhD students, regardless of citizenship, must file income taxes each year. No taxes are deducted from stipends when students are on a ‘fellowship’ (medical years). This does not mean it is tax-free; reporting the income is responsibility of the student. During graduate years, students are on an ‘assistantship’ and federal taxes are automatically deducted from stipends (but not state taxes). Please note that the MD/PhD Program office is not allowed to give any tax advice. Students who are US citizens should contact a local tax preparer with any questions. Foreign students can contact the International Student Office at University Park at (814) 865-6348 and speak to one of the representatives there.

Outside Employment

MD/PhD students are discouraged from outside employment. If an MD/PhD student is considering outside employment, prior approval from the Co-Directors is necessary. If outside employment affects grades, research responsibilities, or participation in program activities, the student will be asked to discontinue the employment immediately.

HOUSING

Fortunately, the Hershey/Hummelstown area has a relatively low cost of living, so housing can be both affordable and comfortable. Neighborhoods in this area are generally quiet and have a very low crime rate. Many MD/PhD students choose to buy a home during their time in the program, especially if they are married. This is also surprisingly affordable in the Hershey and Hummelstown areas. Houses in the Hershey township are often quaint, but a bit older in construction and generally more expensive than the surrounding Hummelstown area.

On-Campus Housing

There are two sections of on-campus housing: University Manor East and University Manor West (see sections below for information on each). They were all refurbished around 2008-2009. The obvious benefits to living on-campus are that you live in close proximity to your classes and other students, and the on-campus housing is slightly cheaper than living off-campus (though the Hershey/Hummelstown area is has a relatively low cost of living anyway, and affordable

off-campus housing can always be found). The major con to living on-campus is that the apartments are not the nicest; the bedrooms and kitchens especially seem small and cramped. Additionally, if you don't apply with a specific roommate or spouse, you will end up sharing a two or three-bedroom apartment with a stranger. Because the on-campus housing is available to medical, graduate, and nursing students as well as medical residents and fellows, so your roommate may have a completely different schedule than you.

The number one tip we can give you is to submit your on-campus housing application as soon as humanly possible (i.e. as soon as you receive your acceptance letter) to ensure getting your choice of apartment. Assignments are made on a first-come, first-served basis by the date of request for occupancy, then by date of receipt. Housing assignments for medical students are made late May through mid-July, as apartments become available. The chances for on-campus assignment are better when an early date of occupancy is requested. Most vacating apartments are available for occupancy mid-June to early July after graduating students and residents completing their education and training have vacated. The housing office attempts to satisfy requests for type of apartment, roommate preferences, second floor apartments, etc.

University Manor East (UME)

<http://www.pennstatehershey.org/web/housing/home/students/maps>

Most students get placed in Manor East, which does not come furnished. UME housing complex consists of 248 student apartments. The complex is made up of the following apartment types:

- 24 one-bedroom apartments are available to one single student with no children, a married student with no children, or two domestic partners with no children.
- 208 two-bedroom apartments are available to two single students (shared unit), married students with no more than one child or without children, or two domestic partners with no more than one child or without children.
- 16 three-bedroom apartments are available only to married students with at least two but no more than three children, or domestic partners with at least two or no more than three children.

Rental Rates (as of July 2013)

- 1 Bedroom Apartment: \$ 890.00 per month
- 2 Bedroom Apartment (Whole): \$ 1,046.00 per month
- 2 Bedroom Apartment (Shared): \$ 523.00 per month
- 3 Bedroom Apartment: \$ 1,174.00 per month
- Short Term monthly rate: \$ 523.00 per month

Short Term daily rate: \$ 38.00 a day

University Manor West (UMW)

If there is overflow from UME, some Penn State students may be placed in UMW. However, the four-bedroom apartments in UMW are usually reserved for visiting medical and nursing students, so they come furnished.

The four-bedroom apartments are furnished with the following:

- Bedrooms – window drapes, wooden bed with bookshelf headboard, mattress, four drawer chest, wooden desk with chair, desk lamp, and telephone. Every bedroom has connections for television.
- Living Room – a three-cushion sofa, two matching sofa chairs, coffee table, two end tables with lamps, and sheer drapes.
- Dining Room – table with four matching chairs.
- Kitchen – refrigerator, range, garbage disposal unit, and microwave.

Off-Campus Housing

Off-campus housing in Hershey or Hummelstown is surprisingly affordable. Many MD/PhD students choose off-campus housing because our stipends allow us some financial flexibility, and darn it, we are here for 8 years and don't want to live like an undergraduate student forever. Below are some apartment rental complexes that many students have chosen in the past. This list is by no means extensive – search the internet for more choices as well as updated rate info on the apartments below.

Briarcrest Gardens, Hershey, PA

www.briarcrestgardens.com

Briarcrest is the closest off-campus housing to the Med Center, with some being within walking distance. If you share an apartment with one or two classmates, it is very affordable.

The Gardens at Hershey Meadow, Hummelstown, PA

<http://www.desouzabrown.com/apartments/hershey/reserve-at-hershey-meadows/overview.html>

The Gardens are located about 7 miles from the Med Center up route 39 past Hershey Park. These apartments are more expensive than Briarcrest, but also much nicer. They were built in 2008 and have extensive amenities. The Hershey Meadows complex includes the Gardens rental apartments as well the condos in

the Reserve and townhomes in the Pinnacle areas. All share access to the Hershey Meadows community center.

Alpine Heights, Hershey, PA

Office: 717-533-3401

Located 'behind' the Med Center a few miles up Bullfrog Valley Road, these apartments are also very affordable.

Madison at Hershey Heights, Hummelstown, PA

<http://www.madisonhersheyheights.com/>

Less than three miles to the Med Center.

LAB ROTATIONS

Rotations are done in order to gain research experience in several different areas, learn multiple lab techniques and to enable students to choose a thesis advisor that matches their interests. You will have to do three lab rotations: one rotation the summer before M1 (minimum of 4 weeks), and two rotations during the summer between M1 and M2 (minimum of 4 weeks each). Ideally you will rotate in labs that you are considering going into for your thesis research.

Being new to the campus, it is difficult to pick rotation labs without much inside information. See the Lab Years section for tips on choosing a lab – use these guidelines for choosing which labs to rotate with as well. Incoming students may choose a lab from the training faculty list (see section in the back of this handbook) and receive assistance from the program co-directors in the selection process. The student may discuss with the program directors potential opportunities for rotations with faculty who are interested in joining the program faculty.

To get started:

- Choose a few MD/PhD faculty with whom you would like to rotate. Use the MD/PhD website or Profiles to help you search for potential faculty (<http://profiles.psu.edu/Profiles/Search.aspx>)
- Speak to your chosen faculty about the research opportunities in their laboratories. They may turn you down up front if they know that their funding cannot support another student to work in their lab.
- Barb Koch will set up a meeting with the MD/PhD student and the Program Co-

Directors to discuss the possible choices for laboratory rotations.

The Program Co-Directors must approve the student's choice for lab rotations. Copies of the student's laboratory rotation schedule will be given to the MD/PhD student, Program Co-Directors, the chosen faculty and the MD/PhD Steering Committee. Changes in the rotation schedule can only be done through the MD/PhD office. Each faculty member with whom a student rotates will complete an evaluation form that assesses the student's performance in the lab. These forms will be kept in the student's files in the MD/PhD Program office.

MISCELLANEOUS

Course Registration and Transcripts

MD/PhD students can access their unofficial transcripts through eLion.

Information about this web site will be distributed and covered during new student orientation. Students can print an unofficial transcript from the eLion site and can also order official transcripts at this same site for a small fee.

MD/PhD students will have two transcripts after they are enrolled in the graduate school. During the M1/M2, their medical transcript will include both graduate and medical courses. After enrollment in graduate school, a second transcript will be created and will include only graduate courses. This graduate transcript will list the student's GPA and will eventually list the dates of their USMLE Step 1, Comprehensive Exam, and Thesis Defense.

Vacation

During the medical years, student's follow the vacation schedule outlined on the block class schedule for M1 and M2 and as built into the clerkship schedules for M3 and M4. Any vacation apart from that indicated in the M1/M2 schedule and prior to beginning thesis research in a laboratory needs to be approved in advance by the co-directors. Vacation or time away from the laboratory during the graduate years is at the discretion of the thesis advisor and needs to be discussed and approved in advance with the thesis advisor.

Leave of Absence:

For students who need to take a leave of absence:

1. Inform the MD/PhD Co-Directors of your situation that necessitates a leave of absence.
2. If you are a student in M1-M4, you must follow the medical school policies for requesting a leave:

Medical Student Leave Of Absence Policy and Procedure

STUDENT ACTION

1. Submit Leave of Absence request in writing to the Assistant Dean Student Affairs

Students may request a leave of absence for personal, health or educational reasons (i.e. off-site research). A student wishing a leave-of-absence must meet with the Assistant Dean of Student Affairs and must submit the request in writing. The written request should include the reason for the leave -of-absence and the proposed duration of the leave. The request may be granted or denied, at the discretion of the Assistant Dean. If the request is approved the student will receive approval in writing from the Assistant Dean. This approval will summarize any conditions pertinent to the individual student's leave and will set a date (60 days before the student is scheduled to return) by which time the student must notify the Registrar and the Assistant Dean of his/her intent to return as scheduled. If at the end of a specified leave-of-absence the student does not notify the Registrar and Assistant Dean of his/her intentions, it will be assumed that the student no longer wishes to continue and has withdrawn from the College of Medicine. The leave-of-absence status will become official when the completed leave-of-absence form for the student has been returned to the Registrar.

Students requesting a leave of absence for health reasons must provide a written request from the physician involved in his/her care at the time the request is made. In addition, an evaluation from the physician must be received by the Assistant Dean of Student Affairs prior to readmission. This evaluation must include the statement that the student from a medical standpoint may resume his or her studies.

Generally, leaves-of-absences for medical students will not be granted for a period in excess of one year. Any "extensions" for a leaves-of-absence must be approved by the Assistant Dean of Student Affairs.

- 2. A leave of absence form will be given to the student to complete. The student is responsible to get all the signatures required on the Leave-of-Absence form. The Registrar (the last required signature) will make a copy of the completed form for the student. The original will be kept with the Registrar.***

LEAVE OF ABSENCE FORM DURING MD TRAINING

(When a student goes on a leave, the Assistant Dean of Student Affairs or Registrar will give the student the form)

COMPUTER ACCOUNT

A student's Penn State Access Account is suspended at the beginning of the semester that his/her leave begins. The account (with the same account number and password) is automatically reactivated a few weeks prior to the student's scheduled return to school. Students, at any Penn State campus, who want to keep their accounts active while on an official leave of absence should complete the Penn State Access Account Extension for Student Leave of Absence form. The completed form can be given to the Registrar. A monthly fee is charged to the student's University account.

3. The MD/PhD Program will provide support for:

Stipend

Health insurance

Tuition

for up to 3 months. An exception may be made based on extenuating circumstances, on a case by case basis.

4. Stipend and tuition support will resume when you return to status as a full-time student.

5. If you are a student in G1-Gx, you must follow the graduate school policies for requesting a leave:

Graduate Student Leave of Absence

A Graduate Leave of Absence (GLA) is authorized permission for a graduate student to withdraw from their formal studies due to a significant health issue or other significant reason that prevents continued progress toward their degree for 6 weeks or more. The GLA provides a transparent procedure for students to resume their studies without having to apply for re-enrollment and without changing conditions and requirements of their graduate program.

Graduate Leave of Absence Policy

DEFINITION

A Graduate Leave of Absence (GLA) is authorized permission for a graduate

student to withdraw from their formal studies due to a significant health issue or other significant reason that prevents continued progress toward their degree for 6 weeks or more.

PURPOSE

The purpose of the GLA is to allow graduate students who must withdraw from their program for health or other reasons to resume their studies without having to apply for re-enrollment and without changing conditions and requirements of their graduate program.

TERMS AND CONDITIONS

A graduate student whose thesis advisor's primary faculty appointment is at the College of Medicine may request a Graduate Leave of Absence (GLA) from their studies when a serious health issue or other serious personal issue arises that interferes with progress toward her/his degree.

*A graduate student requesting a GLA must provide a written statement describing the need for a leave. If the issue concerns the student's health, a statement from the physician involved in the student's care is required at the time the request is made. (This statement does **not** need to provide diagnostic information, but simply confirm that the student's current health status would prevent her/him from success in the program.) The Associate Dean for Graduate Studies will determine what (if any) documentation is required for other situations.*

GLA requests will be granted or denied after review by the Associate Dean for Graduate Studies.

Initial GLA requests can be for up to one year. Extensions to an approved GLA will be considered upon submission of additional information. Extensions to an approved GLA beyond 1 year are at the sole discretion of the Associate Dean for Graduate Studies.,

A student who wishes to return to her/his studies after a GLA must notify the Associate Dean for Graduate Studies 30 days before reenrollment is planned. In the case of a leave for health reasons, a current evaluation from the treating physician indicating that the student's health status has improved such that the student is likely to be successful in her/his studies is required¹. A GLA granted for other reasons may have different return requirements as determined by the Associate Dean for Graduate Studies. Upon receipt of the necessary materials the student will be notified that they may re-enroll and register for the next semester. While reenrollment is technically required due to the Graduate School's current system, for a student with an approved GLA this is a pro forma step to update your status with Penn State; no re-evaluation of academic credentials will occur. If a student with an approved GLA that is about to expire does not notify the Associate Dean for Graduate Studies of her/his intentions to resume formal studies

or request an extension to the GLA, it will be assumed that the student no longer wishes to continue in graduate school and has permanently withdrawn from her/his program.

ACTION STEPS

1. A student requesting a GLA must submit the request in writing, along with a completed, signed GLA

1. If the physician's document is not in English, the student must give permission for a Penn State employee with appropriate language skills to translate the document. All HIPPA and FERPA privacy standards apply.

Form:

The written request should include all pertinent details. If the leave is for health reasons, a physician's statement, including the date the leave will begin, and including the proposed duration of the leave must be provided. The student must meet with and present a copy of the request to her/his advisor. The student and advisor must discuss and document the following:

- a. Any actions that must be taken to preserve laboratory progress before the student leaves*
- b. The date the leave becomes effective (note: the student's stipend will end on this date)*
- c. The likelihood of the student returning to her/his current research project at the end of the leave*

2. Once the student and advisor have signed the form, it should be signed by the student's program director and submitted to the Associate Dean for Graduate Studies.

3. The Associate Dean for Graduate Studies will review the GLA request, after which the student will receive official notice of whether the request has been approved. If approved, this notice will:

- a. Summarize any conditions pertinent to the student's leave*
- b. Set a date (30 days before the student is scheduled to return) by which time the student must notify the Associate Dean for Graduate Studies of her/his intent to return as scheduled or request an extension.*

4. Thirty days prior to the date of return from the GLA, the student must notify the Associate Dean for Graduate Studies. Students must pay any outstanding balance on their student account before reenrolling.

LIMITATIONS

*1. **STIPEND.** The student's stipend will end on the date the GLA becomes effective.*

*2. **HEALTH INSURANCE.** If the student has attended scheduled classes for 30*

calendar days during the semester (or worked in the laboratory for 30 days during which classes were scheduled), the student may maintain health insurance through the remainder of the semester by paying the student's portion of the insurance premium(s) for the balance of the semester.

3. THESIS ADVISOR. *It is generally expected that a student will have the same thesis advisor when they return to their studies, who will provide their stipend and tuition support as before (although their thesis project may change). In rare cases the student may need to identify a new thesis advisor. In these cases the Vice Dean for Research and Graduate Studies will provide up to 4 months of stipend support for the student to identify a new thesis advisor.*

4. HOUSING. *In general, students must be enrolled full-time to maintain eligibility for University housing. If a student requesting a leave of absence is currently living in University Manor housing, and is expected to return to full time studies by the start of the next semester (fall, spring or summer), the student may keep their University Manor housing provided she/he notifies the housing office and continues to pay the rental fee in compliance with their current University Manor apartment Lease.*

5. CONTINUOUS ENROLLMENT. *When appropriate, the Associate Dean for Graduate Studies will petition Graduate Enrollment Services to waive the continuous enrollment requirement as appropriate.*

6. DISSERTATION TIME LIMIT. *Time limits to degree completion (8 years from Candidacy Examination, 6 years from Comprehensive Examination) will generally not be extended.*

GLA FORM

1. The student is responsible for completing a GLA form and obtaining any required signatures, as well as completing any other required forms

a. If the student is currently registered for courses (i.e., the fall or spring semesters, including 600 or 601), the student must complete a Withdrawal Form

http://www.registrar.psu.edu/student_forms/withdrawal.pdf

b. A Withdrawal Form is not required during the Summer Semester (unless the student is registered for classes).

2. The Office of Graduate Studies will make a copy of the fully signed form for the student. The original will be placed in the student's academic folder.

LEAVE-OF-ABSENCE FORM FOR GRADUATE STUDENTS (GLA)

<http://infonet.hmc.psu.edu/graduate-education/students/LeaveofAbsenceForm.pdf>

STUDENT CHECKLIST FOR RETURN TO GRADUATE SCHOOL

<http://infonet.hmc.psu.edu/graduate->

6. The MD/PhD co-Directors should be informed of the date you plan to return at the end of the leave of absence.

Travel Stipends

You are entitled to up to \$300 per academic year (August 1 to July 31) toward travel expenses to attend scientific meetings or conferences from the MD/PhD Program budget during graduate years. To request this money, please fill out a Travel Funds Request form (see Appendix) and email it to Barb Koch or one of the Co-Directors as soon as you decide to go and include the name, date of the meeting, where it will be held and your role at the meeting. The Co-Directors will approve/disapprove the request and notify you of that decision. Please notify the person in your graduate department office who does your travel that the MD/PhD Program will be paying \$300 of your travel expenses and to contact Barb Koch for budget information.

Please save all expense receipts and give them to the person who is doing your travel to send with the reimbursement forms. Receipts are needed as backup (University Policy). Upon returning from your trip, please write a brief paragraph describing your meeting/conference and email it to Barb Koch to be included in the next MD/PhD newsletter.

Mailbox Keys

During the week of orientation in August, new students will receive student mailbox keys. MD/PhD students will use this assigned mailbox for their first two years. When entering graduate school, students need to turn in their student mailbox key at the Post Office. During graduate years students will use the graduate department's mail code. When students return to their third year of medical school (M3), they will again be assigned a different student mailbox number and can pick up the keys in the Post Office. Students will use this same mailbox for their final two years of medical school. Prior to graduation in May of M4, students must return the student mailbox key to the Post Office. There is a fee for lost mailbox keys.

Students Located Off-Campus

If your thesis advisor leaves PSU or if you choose a lab at University Park, you are required to travel to Hershey for the MD/PhD monthly seminar only when it falls on the same Thursday as the Clinical Research Conference. All other MD/PhD monthly seminars can be attended via Adobe Connect. You are required to keep

the program office current on your mailing address and your timeline leading up to your return to M3 clerkships. If you are located more than 4 hours (driving time) from Hershey, you should ask the co-directors to be excused and you should attend via Adobe Connect. The program will pay round-trip mileage reimbursement as long as you carpool (if other students are at the same location). You should also schedule your ½ day per month Clinical Exposure on the same day as the seminar & CRC if you plan to fulfill this requirement on the Hershey campus.

RULES, RULES, RULES

There is a long exhaustive list of Penn State’s policies and regulations regarding codes of conduct, essential standards of graduation, confidentiality, etc. Since we don’t have space to cover it all here, we recommend you get familiar with the Student Handbook that is produced by Student Affairs. Even though it is an older version, the information is still accurate.
(http://www.pennstatehershey.org/c/document_library/get_file?folderId=1416938&name=DLFE-15304.pdf)

ADVISING

Beginning in Fall 2013, a new medical school advising system replaced the former system. Students are placed in societies that will continue until graduation. In addition to those societies, MD/PhD students also have advisors during PhD years (thesis advisor) and one of 3 advisors for residency planning (Jennifer Baccon, Leslie Parent, Diane Thiboutot).

M1 AND M2 YEARS

OVERVIEW

Courses in M1 and M2 cover the basic science that you will need to know for USMLE Step 1. Course grades are composed of examinations, oral presentations, written papers, group facilitator assessments, and objective structured clinical exams. Penn State grades on a pass/fail system; the minimum percentage you need to pass may vary by course, but typically passing is set at 65% on exams. The top percentage of the class will get Honors or High Pass.

Your schedule can change at the last minute - you should check on Socrates each morning for any changes to your schedule. Medicine Education will give you access to the class schedule once you matriculate.

A word on textbooks: for each course in M1 and M2, we have listed a number of useful textbooks for you to choose from. These lists come from suggestions from previous students as well as the course directors. You certainly don't need to buy every book on the list for each course. Some students decide not to buy any textbooks at all, since many are free online through the library (see the section on Harrell Library). Just see what works for you. For now, you may want to buy a good medical dictionary. *Stedman's* is an illustrated dictionary and can also be purchased on CD-ROM. *Dorland's* is another popular choice.

SCHEDULING

Registration for medical courses is automatically done by the registrar for the first semester but must be confirmed on eLion after paying fees (IT, Activity, Disability insurance). You are required to register on eLion for all other semesters. However, you do have to manually enroll yourself for grad classes during your M1 and M2 years (contact Diane Gill in Student Affairs to do this).

PROBLEM-BASED LEARNING (PBL)

PBL is group-based learning component that is mandatory for Penn State medical school. Attendance at all PBL sessions is mandatory! PBL begins during M1 and

continues through the end of M2. You will be assigned to a small group of about eight students. In each PBL session, you will analyze a medical case as a group. Your group has a preceptor that will oversee each case; this is typically a faculty member or sometimes a fourth-year medical student. Many students like PBL, and many hate it. Oftentimes your experience with a case will be determined by whoever is precepting your group for that case, because each preceptor varies a little according to their expectations, requirements, and general disposition. Grading is based on participation and preparation for each case.

In PBL, learning how to find information is just as important as learning the material, because you will use these skills for the rest of your life. Sources such as Up to Date, PubMed, and Dynamed are especially handy for finding PBL information.

M1 COURSES

Phase I – Foundations Year 1

	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
Profession of Medicine	Human Gross Anatomy	Human Gross Anatomy	SPM	SPM	SPM	SPM	Organ Systems	Organ Systems	Organ Systems	Organ Systems	Open time for Research, Global Health, or Vacation	
				Vacation				Vacation				
	Public Health & Socio-Ecological Med.					Humanities			EBM I			
	Found. Patient Cent. Care & Longitudinal Clinical Experience, ½ day/week					FPCC, LCE			FPCC, LCE			

Clinical experience starts fall of first year

Organ system study starts winter of first year

POM – Profession of Medicine
SPM – Scientific Principles of Medicine*

Hematology
Cardiology

PHSM – Public Health and Socio-Ecological Medicine
Medicine Humanities – death and dying, communication of bad news, definition of illness, etc.
EBM – Evidenced Based Medicine
FPCC – Foundations of Patient Centered Care
LCE – Longitudinal Clinical Experience
MEP – Medical Ethics and Professionalism
BIH – Behavioral Influences on Health

*SPM – Scientific Principles of Medicine includes core science principles in biochemistry, molecular genetics, cell biology, pharmacology, microbiology and immunology.

Pulmonary
Renal Medicine

Gastrointestinal Medicine and Nutritional
Musculoskeletal Medicine
Dermatology
Neural and Behavioral Science
Reproductive Medicine
Endocrinology

Primary Care Preceptorship – 1 full week

The Primary Care Preceptorship provides a one-week opportunity for first-year medical students to participate in an organized educational experience in the primary care settings of family medicine, general internal medicine, and general pediatrics. MD/PhD students will complete this during the spring break week that has no graduate classes in March to allow for lab rotations during the summer.

You will only be permitted to spend your week in a primary care specialty (Family Medicine, General Internal Medicine, or General Pediatrics). You can pick a physician to work with anywhere in the country, as long as you get it approved by the Office of Family and Community Medicine - many students choose to work with a physician in their home town. If you choose to go outside of the lottery, we advise you to set it up early. There will be a form you will need to have your chosen practitioner fill out. If you don't have a preference, you will be assigned one through a lottery system. In the lottery, you can list preferences for regions or primary care specialties, but chances are that you may not get any of your choices. The requirements for the week will be to complete at least one interview and one focused physical exam and write a SOAP note. Many of the docs will let you do a lot more, especially if you step up and ask! The grading is pass/fail, and your preceptor will also evaluate you. When contacting your preceptor, make sure that they know what you expect to gain from your experience.

Graduate Courses - Spring Semester

M1 students will be required to take at least 1 graduate course in the spring semester. The administrator will send a list of the courses that will fit into the medical class schedule to the first year students to choose from. Registration for these graduate courses must be done through Diane Gill.

M2 COURSES

The second year of the curriculum continues with an integrated and interdisciplinary approach organized around organ systems. Each block will incorporate more specific material from pathology, pathophysiology, microbiology, pharmacology, and human genetics. Testable material will come from class lectures, PBL, small-group discussions, and Sim Lab assignments. Individual courses include Hematology, Cardiology, Pulmonary Medicine, Renal Medicine, Gastroenterology, Neural & Behavioral Science, Musculoskeletal & Dermatology, Reproductive Medicine, and Endocrinology.

Phase 1: Foundations Year 2									Phase 2: Clinical Core Year 2/Year 3 Introduction			
AUG	SEPT	OCT	NOV	DEC		JAN	FEB	MAR	APR	MAY	JUN	JUL
Organ Systems	Organ Systems	Organ Systems	Organ Systems	Organ Systems	Vacation	Organ Systems	Organ Systems	USMLE	USMLE	Clerkship	Clerkship	Clerkship
EBM II		MEP				BIH						
Found. Patient Cent. Care & longitudinal clinical experience, ½ day/week						FPCC, LCE						

Six week preparation for Step 1 USMLE

Clinical rotations late April of second year

Finally, remember that at the end of M2, you will be taking Step 1 of the USMLE. Many students start studying for the USMLE early in M2 by doing practice questions during each block. This may be helpful, since the questions on the block exams are not necessarily in the same format as the USMLE. For more on Step 1, see the section below.

COURSE DESCRIPTIONS – NEW CURRICULUM

PROFESSION OF MEDICINE (POM)

This first course of medical school is interwoven with Orientation to medical school, and serves as a prologue to the student's medical school experience. It introduces the student to the profession of medicine and encourages life-long learning and reflection. Topics to be included are how to take vital signs, basic life support certification, beginning interview skills, health care quality and safety, and concepts of patient centered care. Also skills such as finding reliable resources and honing study skills to match the volume and pace of work in medical school. The two week course concludes with the White Coat Ceremony during which the modern Oath of Hippocrates is administered.

HUMAN GROSS ANATOMY (ANAT)

This 8 week course will introduce entering medical students to human anatomy, emphasizing integumentary structures, vascular and neural structures, bone and muscle relationships, organs of the thorax and abdomen, skull, major nerves and vasculature. Anatomical relationships are featured, and a cadaveric dissection lab is integral to the course.

SCIENTIFIC PRINCIPLES OF MEDICINE (SPM)

This 12 week course will provide the foundational principles of cell biology, biochemistry, molecular genetics, histology, microbiology, immunology, cancer biology, and pharmacology that are necessary for students to understand the mechanisms that underlie organ system physiology, pathology, pathophysiology and pharmacology. This course is in the fall semester of year 1.

PUBLIC HEALTH AND SOCIO-ECOLOGICAL MEDICINE (PHSM)

The objective of this course is to teach future physicians the principles and application of public health and socio-ecological medicine so as to maintain/improve the health of individual patients and communities. It will include the role and authority of local, state, national and international public health organizations, measures of health and disease, and models for disease prevention and health promotion. This course is in the fall semester of year 1.

HUMANITIES (HUM)

Medical Humanities introduces students of medicine to topics which explore questions of value and meaning in and around medicine. Issues addressed are the patients' experience of illness, social and cultural context of illness and healing, moral dimensions of the doctor-patient relationship, historical development of the profession of medicine, and relationship of the medical profession to society. This course is taught in Phase 1, spring semester of the first year.

EVIDENCE-BASED MEDICINE I (EBM)

This course allows students to learn to apply the basic principles of clinical epidemiology/biostatistics to clinical medicine. Physicians must be knowledgeable consumers of medical literature/information, and to be able to judge the validity of scientific evidence and apply it to patient care. It includes statistical procedures to analyze and interpret clinical data, recognize appropriate study designs, determine validity and reliability of studies, and calculate measures of disease or impact on population health. This course is taught in the spring semester of Phase 1, year 1.

EVIDENCE-BASED MEDICINE II (EBM)

This course extends the concepts of EBM I, and includes constructing good clinical questions, developing good strategies to identify appropriate sources of primary literature, critically appraising clinical literature, judge the applicability of medical information to patient care, and combining best evidence with patient preference. The course is taught in the fall semester Phase 1, second year.

FOUNDATIONS OF PATIENT CENTERED CARE AND LONGITUDINAL CLINICAL EXPERIENCE (FPCC)

This is a four semester course designed to integrate clinical interviewing and history taking skills and physical examination skills at the proficient level in a patient-centered model with emphasis on the patient-physician relationship and factors that affect the effectiveness of that relationship and healthcare management. The course incorporates integrative practice and application of skills, effective communication with patients and other healthcare providers, and documentation, as well as healthcare topics which impact effective healthcare implementation and management. It runs through the entire Phase I.

MEDICAL ETHICS AND PROFESSIONALISM (MEP)

This course provides an introduction to bioethics and professionalism, and provides a framework for understanding ethical issues in medicine. Included are interrelationships between legal and ethical issues in medicine, justice, fairness and rights, informed consent, confidential issues, ethics of research in medicine, ethical issues in genetics, and end of life decisions. This course is taught in the fall semester of Phase I, in the second years.

BEHAVIORAL INFLUENCES ON HEALTH (BIH)

The fundamental course of behavioral science is designed to teach year students emerging systems of care that looks at the mind - body connection within the context of the bi psychosocial-spiritual environment of the individual, and includes provision of quality care needs to include cognitive, behavioral, familial and life style interventions. This course prepares students to integrate the science and the art of medicine. This course is taught in the spring semester of Phase 1 for second year students.

ORGAN SYSTEM COURSES

The organ system courses include **Hematology, Cardiology, Pulmonary Medicine, Renal Medicine, Gastrointestinal Medicine and Nutrition, Musculoskeletal Medicine, Dermatology, Neural and Behavioral Science, Reproductive Medicine, and Endocrinology**. All of these courses will include normal physiology, histology, pathology, pathophysiology, and associated anatomy, embryology, biochemistry, genetics, microbiology, immunology, and pharmacology. These courses begin in the first January of Phase I and extend through the following year, ending in February.

Biological Basis of Human Health and Disease (BMS 506)

This course will cover the biologic basis of human health and disease. Designed to be translational in nature and to parallel the pathology of organ systems presented in the second year medical school curriculum. Topics will include coverage of human disease as it affects organ systems. The major emphasis will focus on the cellular, molecular, genetic, and biochemical basis of human diseases.

Introductory lectures will be followed by discussion of the primary literature that complements the lecture material. Designed to give students an appreciation of diseases affecting the major organ systems, and how these illnesses have been analyzed using the tools of genetics, biochemistry, and cell and molecular biology. Students will be paired with faculty for each class. Registration will need to be done through Diane Gill.

ATTENDANCE DURING M1/M2 COURSES

Attendance is only mandatory for some of the classes during M1 and M2. Anatomy lab sessions, humanities, and PBL sessions are mandatory, as are special courses such as the OSCE sessions, CPR certification, etc. For the normal lecture periods, however, attendance is optional. Most lectures are also video recorded and posted on the web. Many students feel that they learn better on their own than they do by listening in class. Every medical class has a student or two that only shows up for the exams, thus confusing their classmates who have never seen him/her before. You should do whatever works best for you. Keep in mind, though, that the students who perform the best on exams generally attend class regularly. Additionally, staying home all the time gets lonely after a while, and many students find that attending class is their main social outlet.

USMLE STEP 1

The United States Medical Licensing Exam (USMLE) is a three-part licensing examination taken by all medical students in the United States. You will take Step 1 at the end of M2 before you enter the lab to start your thesis research. For the 2013/2014 M2 students, the deadline to take Step 1 is July 1. For future students, the deadline will be April 14 due to the medical school curriculum change. Most students take at least four weeks to study for Step 1. You must pass it in order to advance to your grad school years. If a student fails Step 1, they are required to retake the exam as soon as it can be rescheduled and after allowing ample time to study.

For MD/PhD students, Step 1 replaces the graduate school Candidacy Exam that regular grad students must take. For scheduling and registration information, refer to the USMLE website (<http://www.usmle.org/step-1/>). The fee for Step 1 in 2013 is \$560. Diane Gill in Student Affairs is your contact person; she will send out information at the beginning of M2 explaining registration and locations for taking the exam. Give Barb a copy of your Step 1 score report to keep in your file.

Step 1 has 322 multiple-choice test items, divided into seven 60-minute blocks, administered in one eight-hour testing session. Step 1 is completely computer-based. Your Step 1 question bank will be randomly generated from a database of questions - because of this, there is no guarantee that a particular topic will or will not show up on the exam. Questions are multiple-choice, but that doesn't mean

they are not hard, because some questions make you choose from answers A through P. If you don't know an answer, it is generally harder to use test-taking strategies to "figure-out" questions on Step 1 like you may have been able to do for other standardized exams like the MCAT or SAT. USMLE questions may give you several mostly right answers, but you will be asked to choose the "best answer." For example, a question may ask you what the most appropriate next step in management would be for a particular patient, and though in a real hospital setting you would order tests A through D all at once, the USMLE wants you to select the single appropriate next test.

Everyone has a different strategy for Step 1 studying. Some students in our classes got less than 4 hours of sleep per night for the entire month they studied for Step 1, and others got a full 8 hours a night and did just as well. Some students studied alone, others studied in groups. Above all, don't compare yourself to what others are doing and just study in whatever way works best for you. But consider following some well-meant advice:

- Make yourself a schedule for what you will study each day. Stick to it. If you get behind, move on to the next day's material. You will not do yourself justice by reviewing a single topic for a whole week, because you may not even get any questions on that topic.
- On the same note, do not spend too much time on your 'weak' areas, because again, you may only get two or three questions from those areas on your actual exam.
- Do practice questions and take a few full-length exams. Remember the MCAT? Acing Step 1 is similar in that building your test endurance and getting comfortable with the question format will help you tremendously. The USMLE website offers computer tutorials and practice questions. The NBME website has a full-length exam for purchase called the Comprehensive Basic Science Self-Assessment (CBSSA) (<http://www.nbme.org/Students/sas/sas.html>). Many students also purchase question banks through Kaplan, USMLE World, and some others.

Giving tips on how to prepare for Step 1 could fill an entire book, so we are only giving the basics here. If you want more guidance, ask some upper classmen what they did to prepare.

MENTORING AND COUNSELING DURING M1/M2

Your medical school advisor serves as your preceptor for the clinical experiences and physical diagnosis teaching that begins during M1 and continues through M2. The MD/PhD program directors are designated as co-advisors for the incoming students. The goal of the program is to help ensure that students have the opportunity to obtain the very best training possible.

The MD/PhD program directors meet regularly with students during the M1 and M2 years. Meetings are held in the fall and spring semesters to review students' academic performance, discuss choice of lab rotations, selection of a laboratory for thesis research, and the transition from medical school into graduate school. The co-Directors have electronic access to the student grade folders and receive an email alert when test results are posted. The early warning system allows the co-Directors to help students deal with academic problems before they become more difficult academic deficiencies. The co-Directors and administrator meet with students to provide additional guidance as needed.

Students who may need professional counseling have access to Dr. George Blackall, Psy. D., who provides counseling and referral services to medical and graduate students (see Student Health section).

Career counseling begins when students arrive on campus and continues throughout their training. This occurs on an individual level between the student, the co-Directors and the student's medical school advisor and continues with the thesis advisor, thesis committee and clinical advisors. CTSciNET provides an additional resource for clinical and translational research networking and career development. Students are encouraged to utilize this resource (<http://pennstatehershey.org/sites/ctsi/>).

TRANSITIONING TO THE LAB

The transition from cramming for Step 1 to graduate school can be difficult. Your brain may take a while to shift gears from Memorization Mode to Thinking Mode. Many PIs start their graduate students off by handing them a stack of scientific papers and saying "Why don't you read up on the literature and see where that takes you." The only thing more painful than taking Step 1 is having to read a huge stack of scientific papers immediately after taking Step 1. Don't worry, your

brain will adjust.

ONE LAST WORD

Be especially nice to all your medical school classmates, because they may end up being the residents who evaluate you during your clinical clerkships in M3/M4.

THE LAB YEARS

OVERVIEW

Most students take four years to complete their thesis research before going back to M3. The first step is to choose a good lab where you will be reasonably happy for four years. At the end of your first year in the lab, take your Comprehensive Exam. Your last year in the lab is hectic because you have to write/defend your thesis and the subsequent thesis revisions, finish writing publications, and prepare for M3. You are required to do one-half day of clinic each month to keep you up to date in patient interviewing and physical examination (see Clinical Exposure Program section).

COURSE REGISTRATION

You must register yourself for grad school courses. ELion is used for course registration and for viewing your unofficial transcripts. Complete directions can be found in the Graduate Student Affairs web site, but the major points are outlined below.

<http://www.pennstatehershey.org/web/gsa/home/studentresources/current/registration>

- Registration must be done in fall and spring semesters of each year in the program and must be continuous for graduate courses until the thesis defense is passed.
- You must be registered for 9-12 credits each semester up until you pass your Comprehensive Exam.
- You may have a few required courses to take during the first year or two of grad school (check with your specific program director to see which ones). Register for those first, and then:
 - If you have **not** passed your Comprehensive Exam, register for Thesis Research 600 for the remaining number of credits to total at least 9 but no more than 12.
 - If you have passed your comprehensive exam, register for Thesis Preparation 601 for 0 credits.
- Students must be registered in the semester that they are taking their Comprehensive Exam or defending their thesis. This also means that if you

take Comps or defend your thesis during the summer, you must be registered for that summer semester. If you defend your thesis late and once you are registered for clerkships, you do not need to register in the graduate school since your medical school registration is sufficient.

GRANT WRITING AND COMPREHENSIVE EXAM PREPARATION

COURSE – Course Director is Douglas Stairs, PhD

MD/PhD students are required to take this course in Fall of G1. The course number in Spring of 2014 was BMS 597B but that will more than likely change.

CHOOSING A GRADUATE DEGREE PROGRAM

You must select a graduate program to join. Some graduate programs (like Neuroscience) have a limited number of faculty that you may work with if you join the program. Other grad programs (like Biomedical Sciences) do not have limitations on which lab you may join. Each program has its own requirements, so we recommend that you speak with the program director or secretary before you join. Some programs (Neuroscience) require a good amount of additional coursework in your grad years, whereas others require much less. Notify Barb when you have made your decision so that she can get the necessary paperwork started.

Graduate Program Choices for MD/PhD Students 2013/2014:

At University Park:

- Integrative Biosciences Options:
 - Bioinformatics & Genomics
 - Neuroscience
- Engineering Science & Mechanics/MD/PhD (joint degree program)

Hershey Medical Center COM:

- Anatomy
- Biomedical Sciences or any Option:
 - Biochemistry & Molecular Genetics
 - Translational Therapeutics
 - Virology & Immunology
- Engineering Science & Mechanics/MD/PhD (joint degree program)
- Integrative Biosciences Options:
 - Bioinformatics & Genomics

- Neuroscience *will be discontinued sometime in 2014. Students who are in this program will continue but no new students will be allowed to enroll.

CHOOSING A LAB (AND CHOOSING AN ADVISOR)

Your lab advisor (or ‘PI’) will ideally be your mentor in both research and professional activities during your grad school years. It is expected that students will carry out their thesis research in the lab of a Penn State faculty member either at Hershey or University Park. Students may also carry out research at NIH as part of the Graduate Partners Program with prior permission from the co-Directors. The choice of a graduate thesis advisor and graduate program should be made in consultation with the Program Co-Directors after all summer lab rotations are completed (see section on Choosing a Lab below). Contact Barb Koch to set up a meeting for this discussion.

The process of choosing a lab is different for everyone. Some students make their choice based on purely professional considerations, and others make their choice based on personal factors, but for most students, it is a combination of the two.

Some things to consider when choosing a lab:

Professional Considerations:

- What is the PI’s professional reputation in their field?
- What is the quality of the publications that come out of this lab? Where have the lab’s previous grad students published?
- Will you have intellectual freedom in directing your thesis research, or will you be assigned a specific project by your PI? (FYI, this often depends on the lab’s funding situation)
- Will the PI allow/encourage you to develop professional skills, such as:
 - Writing a pre-doctoral grant
 - Writing a review article
 - Reviewing manuscripts for a journal
 - Traveling to scientific conferences to present your work, or even just to network and learn about the latest research
- What are the PI’s expectations for Comps and thesis writing (will you be expected to do experiments at the same time, or will you get protected time for writing?)
- Who will be teaching you skills in the lab? (post-docs, other students, techs?)

Personal Considerations continued:

- Is the PI a good mentor/role model for you?
- Is the PI a good boss for you?
- Do they micro-manage, or are they more ‘hands-off’?
- Will they be available if you need help?
- Will you be able to work with them for the next four years without going nuts?
- Do you like or dislike the other people in the lab?
- What kinds of hours does the PI expect you to keep? Are they flexible? Do they expect you to work weekends?

Ultimately, you want to join the lab where you will get the best possible graduate education. Communication is essential - talk to the PI to establish what they would expect from you as a graduate student, and what you would expect of them as a mentor. Above all, **TALK TO OTHER STUDENTS** before you join a lab. We cannot express this enough. Almost every year, a student enters a lab only to realize that the PI is not who they had appeared to be during their summer rotation. Talk to the other MD/PhD and graduate students and the people who work in the lab (students, lab technicians, post-docs). Ask them about their interactions with the PI, the hours they work, their opinions on the lab environment overall. Some PIs have reputations for being difficult to work with; the older MD/PhD and graduate students will be able to tell you whose lab to avoid.

A small number of students have two PIs (co-advisors). This can be a good idea if your main PI is off-campus and the other is in Hershey, or if your co-advisors both fund your project.

All thesis advisors are sent a document listing the expectations of them as the advisor of an MD/PhD student so they are aware of the student’s responsibilities such as seminar attendance and clinical exposure.

Switching labs

There are several reasons that students switch labs during their grad years. Sometimes a PI moves to another institution, but more often the reason is that the student and their PI do not get along. This situation can sometimes be avoided if you do a thorough job of asking other students about a PI before joining their lab. On the flip side, some students may have unrealistic expectations for their experience in a particular lab. So before you decide to switch, consider the very real possibility that you may encounter new problems (or even the same problems)

in a different lab. Communicate with your current advisor to identify the problem. If need be, the student and PI can meet together with the MD/PhD co-Directors in order to find a solution. If the issue(s) cannot be resolved, switching labs is an option.

Keep in mind that it is rare that a student is able to take their project with them to their next lab, so switching a lab almost always means having to start over on your thesis research. That said, switching labs is not a death sentence, and many students have done it and still graduated within the four-year window. You will likely have to do another lab rotation for a few weeks before making a choice.

MD/PHD STUDENT ADVISOR EXPECTATIONS

The following information will be sent to all newly chosen thesis advisors so that they are aware of the expectations of advising an MD/PhD student.

Thank you for agreeing to serve as a thesis advisor for an MD/PhD student. We feel it would be helpful to give you information on our expectations as an advisor of an MD/PhD student.

The average number of years an MD/PhD student spends in lab is 4 years. However, if you feel your student is ready to defend in 3 years, please meet with the MD/PhD Co-Directors to discuss the early return to third year clerkships. If you feel your student should take an additional year in lab, a fifth year is possible but again, please discuss with the co-directors.

Thesis: We require the thesis to be completely finished, submitted & approved by the Thesis Office at University Park before a student is allowed to return to M3.

Thesis Committee requirement: All MD/PhD students are required to have at least one member of the MD/PhD Steering Committee on their thesis committee. See the MD/PhD website for a listing of committee members: www.pennstatehershey.org/web/mdphd/home/faculty/leadership

Committee Meetings: MD/PhD students are required to have a committee meeting at least 2 times per year and to submit a written summary of those meetings to the MD/PhD Program Directors.

Publication: We require the student to have at least one first-author paper accepted for publication before the student is allowed to return to M3.

Funding: We expect that students will apply for F30 or F31 fellowship support (or other source of extramural support).

Required Courses:

MI Spring – Genetics 582 Genetics of Model Organisms: Molecular Genetic Analysis of Signaling Pathways

M2 Fall & Spring – BMS 506A and BMS 506B Biological Basis of Human Health & Disease

G1 Fall or Spring (preferably fall) – BMS 801 Grant Writing and Comprehensive Exam Prep

For most graduate programs, the candidacy exam is waived and the USMLE Step 1 exam is the equivalent. The comprehensive exam and thesis defense are the same process as a regular graduate student.

You will be asked to sign an advisor permission memo as confirmation of your support for the student. We also ask your department chair to sign off in case you lose funding.

Students will be considered (based on performance) for selection to attend the national MD/PhD conference in Keystone, CO, as well as regional MD/PhD meetings (APSA). Students should be encouraged to attend scientific meetings/conferences to enhance their research experience.

MD/PhD Activities/Events: Students must be excused from lab to attend:

- *MD/PhD student seminars – held on the second Thursday of each month from Noon to 1:00*
- *CRC (Clinical Research Conference) – quarterly from 5:00pm to 7:00 pm*
- *½ day per month of Clinical Exposure – as scheduled with their preceptor*
- *MD/PhD Annual Retreat-held in late March or early April over a weekend*

THESIS COMMITTEE AND MEETINGS

Your thesis committee will guide you throughout your research years. They will examine you during comps and your thesis defense. They will also be a source of advice and possibly mentorship. Ideally, you want a thesis committee that will challenge you to become a better scientist, but not a committee that will be too strict or prevent you from graduating.

Forming your Committee

First and foremost, consult your PI when choosing your committee - they may want certain faculty included or excluded from your committee. It is to your own benefit if you comply with your PI's recommendations for committee members. If they suggest someone, it's because they work well with that person and think that he/she will be able to give you good guidance. If your committee works well together, your committee meetings will go more smoothly (and be more enjoyable for everyone involved). You must choose a committee within 6 months of starting G1. See your graduate program secretary for more information on selecting a committee and to fill out a committee request form. The composition of the thesis committee must be approved by the MD/PhD co-Directors and the Chair of the

student's Graduate Program.

Your committee should consist of 4 or 5 faculty members:

- At least 2 in the major field
- At least 1 outside the field (not connected in appointment or budget to the doctoral program)
- At least 1 member of the Steering Committee

Committee Meetings:

To keep MD/PhD students on track to defend their thesis and return to M3 in a timely manner, students are required to have a committee meeting every 6 months during graduate years. Committee meetings are arranged by the student with assistance from the Graduate Program secretary (Doodle is a useful tool for scheduling). The first committee meeting is held in January or February of G1 to discuss the student's progress in the laboratory and begin discussions about the comprehensive examination, which is completed prior to the end of the summer semester.

To keep students, committee members, and the MD/PhD program steering committee on the same page, students are required to keep records of their meetings:

- Prior to the Meeting:
 - Student writes a "Progress Report" that includes a summary of their progress since the last meeting and their goals for the next 6 months. This document is sent to the advisor and committee at least 1 week prior to the meeting.
 - Advisor completes the MD/PhD Program "Report on the Doctoral Committee Meeting."
- At the meeting:
 - At the start of the meeting, the advisor discusses the student's progress with the committee and present their initial evaluation of the student
 - At the end of the meeting, the advisor and the committee discuss the student's performance and complete the "Report on the Doctoral Committee Meeting," including short evaluative paragraphs. Any concerns about the student's performance are documented on this form. The advisor and each committee member signs the report and rates the student's performance accordingly.

- After the Meeting:
 - The student writes a “Committee Meeting Summary” to include:
 - Summary of committee’s discussion about progress to date
 - Goals for the next 6 months (agreed upon by the student and committee)
 - Expectations of the student (agreed upon by the student and committee)
 - Timeline for the next 6 months. In G3, this should include a detailed schedule leading up to the thesis defense and return to M3

These reports are sent to the advisor and committee for their input, approval, and signatures. The MD/PhD Program Administrator will keep a record of the committee meetings and remind the students when they need to arrange a committee meeting.

COMPREHENSIVE EXAM

The Comprehensive Exam (Comps) is required for all MD/PhD and graduate students by their specific graduate programs. This exam involves writing a proposal (usually about 10 pages) that proposes a hypothesis and the experiments required to test that hypothesis. After you turn in this proposal to your thesis committee, you meet with them for the oral exam, during which time they interrogate you on your proposal. Usually the oral exam lasts two to three hours. Some graduate programs let students do their Comps ‘on-topic,’ meaning that they can propose a project that is in line with their current lab work. The benefit to doing Comps on-topic is that afterwards, students can easily turn their written Comps proposal into a pre-doctoral grant. Some programs require students to do their Comps ‘off-topic,’ in which case the proposed project must be on a topic completely different from the student’s lab work. This is not such a bad thing, as it really encourages you to think outside the box.

This exam should be scheduled during the summer after completing G1. Our advice is to schedule a date as soon as possible because it is always difficult to get all of your committee members together in the same place at the same time (Doodle scheduling helps). Consult your graduate program secretary for the required paperwork and forms at least three weeks prior to the date of your Comps. Most students take time away from lab experiments for about four weeks to write and study for Comps (be sure to communicate with your PI about their

expectations during Comps writing).

CLINICAL EXPOSURE PROGRAM

During graduate years, all MD/PhD students participate in the Clinical Exposure Program, in which they spend one-half day each month during all of their graduate years with a selected preceptor in a clinic on campus.

The CEP program is coordinated by Dr. Jennifer Baccon (room C7628, x8102). She will help you choose a preceptor. Ideally, your preceptor will be a physician-scientist working in the same area as your research or clinical interest. The CEP runs with the academic year, September through May (participation in the summer months is optional). You must stay with your preceptor for at least one full academic year, but you can change each year if you prefer - choosing a different preceptor each year is a great way to sample different clinical specialties. Students are evaluated by their preceptors who will fill out a (very) brief evaluation form at the end of each year. The evaluation will be reviewed by Dr. Baccon and the program directors. Be sure to communicate with your PI so that he/she knows that you will be away from the lab during your CEP sessions.

Many students neglect or procrastinate their CEP time because they are so busy in the lab, but keeping up with skills like physical exams and patient interviewing will help you in M3. The advantage of the CEP is that the attending physicians generally don't have high expectations for the MD/PhD students in their graduate years - they know that we don't have much clinical experience yet and so they do not expect us to be as good as an M3 student. So use this time to learn how to be a good M3 student without the pressure of being graded: practice patient interviewing, physical exams, and SOAP notes. Familiarize yourself with the electronic medical records, dictation system, and other clinical logistics. Lastly, get familiar with the electronic resources on your PDA/smartphone. Download some medical apps and see which ones work best for you (see the Library section for a list of useful medical apps).

MD-PhD Clinical Exposure Program (revised 8/2013)

Program Goals:

- Expose students to subspecialties in order to promote informed decisions regarding residency training
- Expose students to physician-scientist mentors
- Provide opportunity to practice physical exam skills
- Promote maintenance of clinical competence during Graduate School years
- Reduce anxiety associated with the transition from Graduate School back to Medical School
- Improve MD-PhD student academic performance in the clinical years

Program Requirements:

- Students will spend ½ day a month shadowing with a mentor during their Graduate School years
- Students will meet with Dr. Jennifer Baccon on a yearly basis in order to identify and select a mentor
- Students are encouraged to identify a mentor for each year, so as to gain exposure to at least 4 mentors/subspecialty areas
- If a student finds a particularly engaging experience and wishes to participate in the same setting for multiple years, the student should discuss with Dr. Baccon who can grant permission for renewing the same experience
- Dr. Baccon will contact potential mentors on behalf of the students
- Once the mentor-student pairs have been made, it will be the responsibility of the student to arrange details about the scheduling of the experience with their assigned mentor
- Evaluations of the student by the mentor and of the mentor by the student will be components of the Program
- At least two of the shadowing experiences must be in clinical areas where direct patient interaction and physical exam skills are utilized
- All students (including those doing thesis work at University Park) will be required to do 2 of the 4 experiences at Hershey Medical Center
- All students will be required to do 2 of the 4 experiences with a physician-scientist or a physician who practices in a subspecialty area

- Please note that exposure experiences at University Park will be available so that the remaining 2 experiences can be completed at University Park
- Attendance will be taken and logged

SURVIVING THE ‘LULL’

There is a period during the graduate years (usually somewhere between G2 and G3) when nearly every MD/PhD student experiences some feelings of hopelessness, regret, depression, and overall inadequacy. At the end of G2, your medical school classmates have matched, graduated, and moved on with their lives. You, however, are stuck in what seems like purgatory with no data, no thesis defense date in sight, fewer friends than before (most of them matched and graduated, remember?), and no diploma to show for yourself even though you have been in Hershey for over four years.

It may not seem like it, but you will graduate. Towards the end of G3 and the beginning of G4, experiments start to work, and your data comes together as if by magic. It happens to everyone! Every student will say that it happened to them, but you will still not believe it until you have been through it. Keep your chin up; everything will be ok, and you will (eventually) be glad that you chose to enter the dual degree program.

PUBLICATION REQUIREMENT

MD/PhD students are required to have at least one first-author publication (primary research, peer-reviewed) accepted, before being allowed to defend. Having an accepted publication will strengthen your residency application and CV and is in your best interest. Your thesis advisor is aware of this requirement.

WRITING AND DEFENDING YOUR THESIS

Writing a thesis is a huge undertaking. Ideally, you will be done with lab experiments and will be able to spend three to six weeks doing nothing but thesis writing at the end of G4. However, because MD/PhD students have limited time, you might end up doing last-minute experiments at the same time as writing your thesis and preparing for M3.

Our advice is to start writing as early as possible. Long before you ‘officially’ begin writing, you should be collecting information and references for your background/literature review. Additionally, you may have started a few projects years ago that didn’t go anywhere - these will likely end up as appendices in your thesis, in which case you can start writing those sections early.

****Make sure you refer to the Penn State University Park guidelines for thesis deadlines, formatting, and required forms****

(<http://www.gradsch.psu.edu/current/thesis.html>).

Steps for getting through your thesis defense:

1. Schedule a committee meeting in late G3 or early G4 and present all your data. Put your figures in the general order in which you would for your thesis. Show your committee the complete story, meaning if you have any negative data, at least mention it so that your committee sees how much work you have done.
2. When your committee agrees to let you start writing, schedule your thesis defense date as soon as possible. Committee schedule conflicts have held former students back from entering M3 on time. Doodle is a helpful tool.
3. Activate your Intent to Graduate on eLion for the semester you will defend your thesis. This is necessary even though we are not walking in the graduation ceremony that semester.
4. Talk to your graduate program administrators. They will give all the required forms and deadlines.
5. Have your PI proof your thesis before you give it to your committee.

Tips for thesis success

Remember that your committee members are very busy. They have to read your 200-page thesis as well as other students’, so don’t make it painful for them. In general, a well-written thesis will reduce the agony of the final thesis defense.

Some tips for writing a dynamite thesis:

- Explain, explain, explain!!! Your thesis is not the place to sugar coat your findings or to conveniently ignore unexpected results (save that for your publications). Explain in writing about the reasoning behind choosing your methods, the limitations of your model system, what worked and what didn’t, why you got unexpected results, etc. If you don’t explain these issues in your thesis, your committee will definitely ask you about them at your defense. It is ok to have limitations to your model or unexpected findings (every project

does!), so seize control by just acknowledging them up front.

- Use correct grammar and punctuation. Sloppy writing will just annoy your committee.
- Pay attention to details. Make sure your figures look good. Are your significance stars aligned? Are the colors pleasing to the eye?
- You can refer to other students' theses to get ideas for style and formatting. You can read every PSU student's PhD thesis online in an electronic database found here (<http://etda.libraries.psu.edu/ETD-db/ETD-search/browse>)

If you are defending late spring or early summer before entering M3, you will have very little time to finish thesis revisions/paper revisions/extra experiments/etc before M3 starts. Consider finishing your thesis writing early and asking your committee members to read it and make comments a few weeks before you defend - that way you will be able to make revisions early.

MENTORING AND COUNSELING DURING GRADUATE YEARS

During your tenure as graduate students, your graduate thesis advisor and thesis committee serve as the primary source of advising/mentoring. Each student is required to present a research seminar and meet with their thesis committee twice per year (or every 6 months) during the graduate years, and a progress report (filled out by the you and your advisor) is filed with the Associate Dean for Graduate Studies (Dr. Verderame), as well as the MD/PhD program. The program requires that one member of your thesis committee be a member of the MD/PhD Steering Committee. This representation ensures that the co-Directors have adequate feedback as to your progress towards completing degree requirements in a timely and productive fashion. During the graduate years, the co-Directors meet with each student once per year to review their progress.

TRANSITIONING TO M3

During M3, you will be thinking about nothing but medicine. Nothing! Between long work hours and studying for shelf exams, you will not have time to do thesis or paper revisions. Do yourself a favor and finish your thesis and publication manuscripts early and completely so your brain can focus fully on the clinics. If you think you may have additional paper revisions to do, then schedule a research elective month in September of M3 (for more on this and other preparations for M3, see the M3/M4 Chapter below).

Just to emphasize in case you weren't paying attention: **YOU WILL NOT HAVE TIME TO FINISH PAPER OR THESIS REVISIONS DURING YOUR M3 ROTATIONS!!!!**

Scrubs Machine Access

You will need to reactivate your access to the scrubs machine by calling Linen Services at x8320. Have your PSU ID# on hand to give to them and tell them you are an MD/PhD student returning to third year clerkships and need access to the scrubs machine.

M3 AND M4 YEARS

OVERVIEW OF M3 & M4 **Curriculum may change*

The third year begins with a week-long Transition to Clinical Medicine (TCM) course. This course provides students with necessary skills to begin their clinical work. The remainder of the third year includes a sequence of required core blocks in Medicine (A&B), Family and Community Medicine, Obstetrics and Gynecology, Mat-Newborn, Pediatrics, Psychiatry, AHEC, Neurology and Surgery (A&B) plus an elective. Students complete at least one month of elective time in the third year.

Sample M3 Schedule for AY 2014/2015

Transition to Clinical Medicine June 18-27, 2014		
Block 1: June 30-September 12		
Rotation	Start Date	End Date
1	June 30	July 23
2	July 24	August 18
3	August 19	September 12
Block 2: September 15-November 26		
Rotation	Start Date	End Date
1	September 15	October 8
2	October 9	October 31
3	November 3	November 26
<i>Thanksgiving Break November 27-30</i>		
Block 3: December 1-March 6		
Rotation	Start Date	End Date
1	December 1	n/a
Reflection and Assessment Days (December 17-19)		
<i>Winter Break (December 20-January 4)</i>		
Rotation	Start Date	End Date
1 (cont.)	January 5	January 13
2	January 14	February 9
3	February 10	March 6

Block 4: March 9-May 22		
Rotation	Start Date	End Date
1	March 9	April 1
2	April 2	April 28
3	April 29	May 22

Sample M4 Schedule for AY 2014/2015

4-Week Courses		
Year III OSCE – May 13-22, 2014		
Rotation	Start Date	End Date
1	June 30, 2014	July 25, 2014
2	July 28, 2014	August 22, 2014
3	August 25, 2014	September 19, 2014
4	September 22, 2014	October 17, 2014
5	October 20, 2014	November 14, 2014
6	November 17, 2014	December 12, 2014
<i>Winter Break (December 13-January 4)</i>		
Rotation	Start Date	End Date
7	January 5, 2015	January 30, 2015
8	February 2, 2015	February 27, 2015
9	March 2, 2015	March 27, 2015
10	March 30, 2015	April 24, 2015
MCLKS 705: Transition to Internship April 27-May 1		

Plan for clerkships and Cross-over AY 2014/2015

- Merge current clerkships into 4-233k clerkship blocks with 12-week cycles
- Presents more flexibility and promotes integration between clerkships.
Clerkships within each block will provide Orientation on the first day

New MD/PhD Student Requirement

All M3 and M4 MD/PhD student clerkship rotations are to be done at PSHMC only. This was discussed and approved by Drs. Wolpaw and Moser. Exceptions are Family Medicine and AHEC since neither are offered at PSHMC. However, you should choose a location as close to PSHMC as possible. In M4, if you plan to

apply to a residency program off campus and would like to to a rotation there, that is allowed with approval from your advisor.

Reasoning:

- 1) To benefit from having subspecialty rotations relevant to MD/PhD residencies and physician scientist role models that are only available here
- 2) So that M3 & M4 MD/PhD students can attend all MD/PhD events (seminars, CRC, etc.) and provide vertical integration, which is so important.

In addition, all M3 & M4 schedules must be signed by the MD/PhD residency advisor (Baccon, Parent or Thiboutot). *You are required to choose from one of the 3 designated residency advisors for MD/PhD students and let Barb Koch know who you have chosen. Plan to meet with them at least twice per year. The schedule signature is required because students are supported by either NIH grants or institutional funds or both.

Preparing for M3 Clerkships

Review some M1/M2 material

Take advantage of the TCM week to do some reviewing. This course is geared towards preparing you for M3 anyway, so your brain will already be in that mode. Many students have said that during M3/M4, they did not need most of what they learned for Step 1 USMLE, so focus on the more clinically-relevant material like anatomy, physiology, pathology and drugs. You may also want to schedule several days of clinic time with your CEP before you start M3.

Buy some stuff for your white coat pockets

There is a running joke in hospitals that you can tell the level of a physician by the contents of their white coat pockets. Medical students' pockets bulge with books, notes, equipment, and snacks. Residents' pockets are sleeker and contain fewer books. Attendings' pockets contain nothing but a few sticks of gum, and they will inevitably have to borrow your stethoscope or pen because they never carry theirs.

Of course, you do not have to buy books to carry with you. Some students don't carry anything at all, some carry only their smartphone, and some carry much, much more. We have outlined some general recommendations below, but some of the clerkship sections in this handbook have additional recommendations that are specific to that clerkship.

For all your clerkships, the top recommendations by medical students for keeping

in your white coat are:

- Blank notebook or notecards
- PDA or smart phone
- See the Library section for information on useful medical apps
- *Maxwells* or *MD Pocket Medical Reference* (pick one)
 - Essential!! They are small pocket-sized booklets containing tons of useful information like normal lab values, dermatome maps, the structure of pre- and post-op notes, child immunization schedules, neuro exam landmarks, etc.
- *Pocket Medicine*
 - Available in the bookstore. Though focused on Medicine, it is an extremely useful and compact resource for all the clerkships. You will see most students and residents carrying a copy.
- Your yellow EKG card
 - This is your cheat sheet for reading EKGs. You will get this during TCM, and Dr. Zelis will explain it all.
- Extra pens - residents will frequently ‘borrow’ yours permanently
- Snacks (especially for Surgery) - you never know when your next meal is
- Medical equipment
 - Your stethoscope is essential.
 - A pen light is often useful
 - You don’t need your ophthalmoscope/otoscope
 - You will use your reflex hammer once in a while on the Medicine wards, but otherwise you mostly will use it and your tuning fork on your Neurology rotation.

Make sure you are on the M3 email list

All scheduling information is given out by email. Barb always asks the Med Ed office to add the MD/PhD students to the email list, but every now and then they ‘forget’ or leave someone out. Scheduling information starts being sent out in November/December for the next year. If you are not receiving emails for the current M2 class by November of your G4 year, let Barb know.

3RD YEAR ROTATION SCHEDULING

During your 3rd year of medical school, you will complete the core clerkships as well as at least one elective. Scheduling is done through OASIS. Don’t worry if you feel lost during the process - everyone does (including the regular medical

students). The Med Ed people will tell you everything you need to know. The registrar website usually has answers to your questions about clerkships and electives. Or, when in doubt, ask Barb or one of the older students. (www.pennstatehershey.org/web/educationalaffairs/home/registrar).

The medical school has a series of lunch lectures in November/December that provide information on scheduling and site selection. Try not to miss these lectures, or you will feel lost during the scheduling process. You will begin the scheduling process in mid to late January of your G4 year.

Site Selection

After you are assigned a specific cohort (typically around early February), you will then rank your choices for sites for each clerkship. Diane Gill is aware that MD/PhD students are to do all rotations at PSHMC.

In the end, the order of your M3 clerkships doesn't really matter. If you are worried about starting with Surgery because you want to pursue a surgery residency, just relax. The order of your M3 rotations will be in your Dean's Letter, so residency programs will be able to see that you did Surgery first, and they will take that into account when looking at your Surgery grade. Plus, recommendations from your AIs carry a lot of weight, so focus on doing your AIs early in M4, and do well in them.

TRANSITION TO CLINICAL MEDICINE

As mentioned above, the TCM course is built into your M3/M4 schedules. Remember that this course is absolutely mandatory attendance. You cannot miss any of these classes, or you will have a lot of trouble moving on to M3 clerkships. They are extremely strict about this policy and take attendance at every single lecture and group activity.

3RD YEAR CORE CLERKSHIPS

Your core clerkships for M3 include Surgery A& B, Family Medicine, (Internal) Medicine A&B, Psychiatry, OB/GYN, Mat & Newborn, Pediatrics, and Neurology. Each of these clerkships has a final exam. Your grade is calculated slightly differently for each clerkship, but generally about half of your grade will be from the clerkship exam, and the other half will be from your clinical evaluation

by your attending on the clerkship service. Information about each specific clerkship can be found below, but first we want to give you some general advice.

How to do well in clerkships

First, accept this frame of mind: you are here to learn, and you are low on the food chain. Clerkships are stressful. If you embrace each one as an opportunity to improve, you will do well and you will be less stressed. You will make mistakes - if you already knew everything, you wouldn't need to be in school. So don't take it personally if a resident criticizes you, even if the criticism is in the form of a yelling rant. Take comfort in the knowledge that you will never make that particular mistake again.

Being low on the chain of command has some obvious disadvantages. You may be given scut work, or even ignored completely. Don't let them ignore you - do anything and everything in your power to contribute, even if that means doing the scut work. Show your attending physician or resident that you are a willing team player and that you are capable and eager to do whatever it takes to provide the best care for patients. Be cheerful and try to make the residents' job easier.

Simply asking the residents "What can I do to help?" is one of the best ways to get a good experience on the rotation and a great evaluation at the end.

There is also a big advantage to being low on the chain of command. As a student, you are responsible for fewer patients than the residents. Plus, you work shorter hours than the residents and take much less call (side note: Penn State guidelines say that sites should aim to have medical students work 40-60 hours per week so that we have time to study for Shelf exams). Because of these factors, you can spend more time with your patients than the residents can. Take this opportunity to do really thorough work-ups and truly understand the diseases that you encounter.

Your first day

All clerkships have an orientation on the first day. If you are doing a rotation at a site other than Hershey, you will have an orientation in Hershey on the first day, and you may have another orientation at the rotation site on the second day of the rotation. For Hershey orientations, check out the schedule on ANGEL. For other sites, you will usually get an email telling you where and when to arrive for orientation, but if they don't contact you, you should contact them! Find out who your attending or resident will be, and page them the night before to find out where/when to show up.

Always dress in professional attire on your first day (even if you are in your

Surgery clerkship). The sites generally want students to be dressed professionally at all times unless they are in the OR. You will be told when and where it is acceptable to wear scrubs.

On your first day (especially at away sites), you will also need to find out details about all the logistical stuff like parking and ID badges. Be sure to ask where the locker rooms are, and where it is safe to leave your stuff while you are in the clinic or OR.

On your first day, be sure to write down:

- Your residents' and attendings' pager numbers
- Phone numbers for the lab, radiology, pharmacy, etc
- The username and password for site's workstation computers and electronic medical records

What do you do during the day?

Unfortunately, there is no one answer to this question. The larger and more organized sites will tell you what they expect of you. The smaller sites may not have formal guidelines, in which case you should ask your resident directly "What can I do to help?" We have outlined some general guidelines below for inpatient and outpatient clinical settings, but keep in mind that whatever your resident or attending tells you to do trumps everything.

Keeping Track of Your Patients

Above all, be organized. Find a system that works for you. You can keep a notebook with your patients' information in it, or carry notecards (one for each patient).

Inpatient Service

You will see many patients on inpatient services, but you may be given two or three patients that will be exclusively 'yours.' If you are not assigned any patients, take the initiative and take ownership of a few. You will do rounds with the residents and attending each morning, but you will want to do your own 'pre-rounds' every day - arrive before the residents, see your patients, do a history and physical, track any changes from the day before (especially if there were complications), write an updated SOAP note and leave it in the chart before the resident sees that patient.

Tips on writing notes

- Read the residents' previous notes to see what you should focus on and how

to structure the note itself. Always focus on the chief complaint and highlight any changes from previous days.

- Talk with the resident about what might be best to include in your note.
- Photocopy your note to keep with you on rounds, leave the original in the patient's chart (an easy and super useful thing to do!). You can then refer to your note while presenting your patient on rounds.
- Do not neglect the assessment and plan portion of your note - residents will ask you what your assessment is.
- Have all your SOAP notes done before rounds. Some patients take longer than others, so plan accordingly.

You will then go on rounds with the residents and the attendings. Have your copies of your SOAP notes with you, present the cases to the team, and get feedback from your team on your presentation and your assessment/plan for each case. During the rest of the day, you will probably team up with a resident and take care of patient-related tasks such as writing orders, following up on lab results, etc. Inpatient time can be feast or famine; some days will be crazy busy, and others will be slow. Carry a small review book around in your white coat so if there is downtime, you can read or do practice questions.

You will probably have some call duty while you are on inpatient service; the amount depends on the site and the rotation. Being on call can be a great learning experience, because oftentimes you will get a lot more personal attention from the residents on call than you would during the day. Residents will usually let you do more on call. This is a great time to get some of your procedures done (putting in IVs, drawing blood, placing NG tubes, etc).

Weekends are usually your own, though it depends on the rotation and the site. Some clerkships require you to work at least one weekend. Many times you will be expected to attend Saturday morning rounds or conferences, but these usually don't last beyond noon.

Outpatient Service

On many clerkships, you may be required to attend inpatient rounds in the morning and then go to an outpatient clinic for the rest of the day, or some days you may be exclusively outpatient. In outpatient clinics, you will not have patients that you follow continuously, and you will likely not see the same patient twice. Show up at least 15 minutes before clinic officially begins. For each patient you see, review the chart, see the patient by yourself first and do an interview, physical, create a plan, and then present the case to the attending or resident. Then you and

attending/chief will re-enter the room and discuss the plan with the patient. It is much harder to get any procedures done during your outpatient time.

Lectures

Hershey and most other sites also have didactic lectures during the day for students and/or residents - these are mandatory attendance. You will get a schedule for these and be expected to attend. Your residents/attendings know to excuse you from clinical duties for these lectures. When on inpatient service, you may want to eat during the lectures in case you don't get another chance.

Customizing your education

This is your education, after all, so get the most out of it. If you are interested in seeing a particular subspecialty on a core clerkship, ask the site clerkship director if it would be possible to arrange. For example, some sites do not require students to spend time on a Reproductive Endocrinology/Infertility service during the core OB/GYN clerkship, so if you would really like to spend a day or two in an infertility clinic, just ask. The very act of asking shows that you are interested in learning, and most sites will attempt to accommodate such requests.

How do you study each night?

Read, read, read!!!! The material that you learn each night is a balance between patient-gear learning and Shelf exam-gear learning. If you have a patient with a COPD exacerbation, read everything you can find about COPD (including the latest information from Up to Date) so that on rounds the next morning you can answer any pimp questions correctly. Knowing the latest recommendations from Up to Date is also a huge bonus on rounds. In fact, many attendings stay updated on the latest recommendations by asking the students. If you formulate an assessment and plan around the latest evidence-based medicine, that is an Honors-level report. You will impress your attending and residents, which will translate into more respect and less scut work later.

Be sure to spend a portion of each night learning material that will be on the Shelf exam (consult review books for a list of topics). More about this below.

Clerkship Exams

Every core clerkship has an exam at the end. These are national exams, and the passing cut-off is usually around the 10th percentile for the nation (you must pass the Shelf to pass each clerkship). Each exam gives you 2.5 hours to answer 100 multiple-choice questions.

Keep in mind that the exams cover everything, not just the cases you have seen. The clerkship training is less uniform than the M1/M2 classes - differences in attendings, sites, and patient populations can give you a totally different experience than other students on any particular clerkship. You will need to do a lot of reading outside your patient cases. A popular strategy among students is to concentrate on specific patients during the week, and on the weekends study more generally for the shelf exam. Keep up with your studying! Try to do at least 2 hours of reading on average per night (seriously!).

Review books are popular for exam preparation. There are electronic versions of a lot of these circulating through the medical classes (Kaplan, 1st Aid, Appleton and Lange, and Pretest, to name a few); ask an upper classman for copies. A common trap is to rely on review books too heavily. Use review books to make sure you are covering all the topics, but do most of your reading in *Cecil's*, *Harrisons* or similar references.

More information about specific review books for the exams or the USMLE can be found in the specific sections for each below. Note that the clerkship exams could be changing in the near future.

Attendance during M3 clerkships:

Attendance is mandatory during each clerkship. You are only allowed to miss one day (excused absence) for the 4-week clerkships and electives, and up to 2 days for the 6 and 8-week clerkships**. Planned absences must be cleared with the course director at least 4 weeks prior to the beginning of the course. Note that approval of absences is entirely at the discretion of the clerkship director. 'Excused' absence denotes severe illness, death of a family member, or attending a scientific conference. Invalid excuses include family vacations, attending a wedding, etc. An unexcused absence may result in a failing grade for the clerkship. No absence will be excused (for any reason) from the Shelf exams, Island courses, and the TCM course.

***We aren't supposed to tell you this, but it is possible to miss more than one day of a core clerkship to go to a scientific meeting. If you ask the clerkship director ahead of time and offer to make up for any missed clinic duties, they will usually try to accommodate you, especially if you are presenting your own research at a conference. If it is an off-campus rotation, be sure to ask the director at your site, not the director at Hershey.*

Clerkship Grades and Evaluations

For each clerkship, you need to be evaluated by a resident/attending as part of your grade. You will receive both a written evaluation as well as a score for your performance in the clinics. Comments from the written evaluation go into your dean's letter verbatim. You may sometimes choose who to give your evaluation form(s) to, but keep in mind that when evaluating you, the attending will ask for input from the residents. So be nice to all the residents in case they are consulted for your evaluation.

Final grades are calculated slightly differently for each clerkship, but generally about half of your grade will be from the shelf exam, and the other half will be from your clinical evaluation by your attending on the clerkship service. You must pass both the shelf and the clinical evaluation to pass the clerkship.

For the highly competitive specialties, it is of paramount importance to do well in the core clinical clerkships. Try to get Honors in as many clerkship as possible. This will not only afford for a good dean's letter, but also an acceptance into Alpha Omega Alpha (AOA).

Required Procedures

You will be given a list of required procedures and patient encounters for M3. You must complete all of these procedures and log them in the New Innovations website (www.new-innov.com). Our general advice is to be proactive - no one will ask you in the OR if you would like put in the Foley catheter, so if you see the nurse getting a Foley kit out, ask if you can put it in. Not only will the nurses let you, but they will often help you through it, too. Get the procedures done as early as possible (whenever you have a chance), and keep up with logging them in New Innovations every day. Procrastinating the logging until the end of the rotation will create hours of last-minute work for you during the days when you want to be studying for the Shelf exam.

More general advice for clerkships:

- Your resident/attending is always right. Do what they want, the way they want it, when they want it.
- Look happy and interested, even if you are exhausted.
- Don't be late, ever.
- If you don't know an answer, admit it. Never lie or make up information.
- If you don't know how to do something, ask.
- Never answer a question that the attending asks the resident (even if the resident says they don't know, don't speak up unless they ask you to give an answer)

- You will get yelled at once or twice during M3. And it's not always a resident or attending; you may be yelled at by a nurse, or a patient, or a patient's parents. Just be professional and learn from it.
- Try not to get frustrated when a patient tells you something completely different than what they later tell the attending. Patients do this all the time. It will make you feel stupid, but don't worry, the attendings know that this happens a lot.
- Magic words to ingrain in your vocabulary:
 - "I'd like to do [this procedure], but I don't know how. Would you show me?"
 - "I don't know the answer, but I will find out."
 - "What can I do to help?"

Surgery Core Clerkship

Overview. The Surgery clerkship is composed of two halves that make up a total of six weeks. Each student has a 'general surgery' experience (2 weeks) as well as a 'subspecialty surgery' experience (2 weeks). In actuality, there are too many students for each individual to be on a 'general surgery,' and thus many students will have their 'general surgery' component on a subspecialty service. These surgical services that serve as the general component for the rotation vary, but typically include Emergency General Surgery, Surgical Oncology, Endocrine, Colorectal, Vascular, Transplant, Trauma, and Pediatric Surgery (you will be able to rank these choices in OASIS).

For the 'subspecialty' experience, you will be sent an email a few weeks before the start of your rotation asking you to rank your choices for subspecialty selectives. Students generally get their first and second choices for subspecialty. Surgery clerkship subspecialty selectives include breast surgery, ENT, cardiothoracic, transplant, urology, plastic surgery, neurosurgery, and orthopedics.

Regardless of the service that you are assigned to, your goal should be to understand the fundamentals of surgery and become familiar with as many types of surgical patients and problems as you can during your rotation. For many students, this will be the last time that they will ever be in the operating room.

Responsibilities as the Medical Student. For the general portion of the Surgery rotation, medical students typically start the morning by pre-rounding on one or two patients and writing a daily SOAP note prior to rounding with the rest of the surgical team. Generally, you will follow patients that you saw in the operating

room. Thus, you're familiar with their operative course, complications, medical history and indication for operative management.

When reading about your patient cases, focus on the following:

- Why is this patient going to the OR?
- What is the disease process and relevant anatomy/physiology?
- What are the treatments for this disease (both surgical and non-surgical)?
What are contraindications for surgical treatment?
- How do you manage this patient post-operatively? What are the post-op complications to watch for?

The hours on the Surgery clerkship can be longer than most other clerkships (typically 5AM to 6PM, if not longer). The days start early because the surgical team needs to finish rounds prior to the first operative cases which typically start at around 7:30AM on most weekdays. For call duty, students at Hershey are required to take one night of overnight call per month (that's only two call nights for the entire 8-week surgery rotation), but they may also work some daytime weekend shifts. Some other sites have overnight call once a week, but weekends are completely free. Clearly this is unlike surgical residency, which can have overnight call at most every third night. The idea of taking call as a student, though, is only to give you a taste of what happens overnight. Additionally, it is beneficial to see various surgery consultations with the senior surgical residents in the Emergency Department when you're on call. This is also the time when you can get a lot of procedures completed.

Surgical Recall and *Lawrence's Essentials of General Surgery* have introductory chapters about OR chain of command, scrubbing in, and etiquette in the OR. Read these before your first day in the OR. The expectations vary from service to service, and between residents/attendings. Ask your team how they do things and what they expect of you.

Doing Well in the Surgery Clerkship. The most important preparation you can do each day is to pre-read the evening prior to surgical cases. The OR schedule is available online days in advance (the residents will show you how to access this schedule) and you should know which cases you want to be involved with for the following day. If you are the only medical student on a particular service you can go to whichever cases you want. However, if there is another medical student on service you should try and decide ahead of time who is going to scrub in on which cases so that you can prepare the night before.

Become familiar with the patient/case that you are in the operating room with prior

to the beginning of the surgery. Many attending surgeons will expect that you know the patient's past medical history and why they are having a particular procedure. Furthermore, knowing these things will allow you to learn a lot more during the actual time spent in the operating room.

Shelf Exam. As mentioned above, the Surgery clerkship focuses on patient management, and the shelf exam reflects this. You will do yourself a service by reading from a general Medicine textbook, like *Harrison's*. Keep in mind that the Shelf will not ask you about types of suture knots, equipment, etc. Even though the hours can be long on surgery, the residents know that you have to be studying for the shelf as well.

Good resources for the Shelf:

- The following two books are provided to you to borrow for free during the Surgery clerkship:
 - *Lawrence's Essentials of General Surgery*
 - *Surgical Recall* – very helpful, carry it with you and skim it before each surgery. This is a favorite book by most students, by far.
- Kaplan Notes- the vignettes are great! Read them at least once
- *Pretest* – very good, best question book
- *First Aid for Surgery* – good number of students used it and liked it
- *Blueprints* – not too helpful, too general
- *Appleton and Lange* – just okay, much fewer students reported using it
- Use *Lawrence*, *Cecil's*, *Harrison's*, or *Up To Date* for specific reading about pathology leading to the surgeries.

Other tips for the Surgery Clerkship:

- Show up the first day wearing professional attire. Many sites do not want to see medical students in scrubs unless they are in the OR.
- Carry tape, scissors, and gauze in your white coat pocket for changing dressings on rounds.
- You may not get time to eat regular meals. Keep snacks in your white coat pockets.
- Buy a pair of Dansko clogs for the OR. Yes, they are ugly, but your feet will thank you. Some people like Crocs, as well.

Pediatrics Core Clerkship

Overview: The Pediatrics clerkship combines inpatient and outpatient exposure to pediatric problems and diseases. Your time on the peds inpatient wards can be

extremely rewarding because you will likely bond with certain patients and their families during the course of their hospital stay. In the outpatient setting, there is a lot of emphasis on the ‘Well-Child Check’ and developmental milestones, as well as preventative medicine such as immunizations and child safety. Depending on your site, you may also be exposed to sub-specialty clinics such as peds cardiology, gastroenterology, surgery, rheumatology, etc. You will also be exposed to adolescent medicine and issues of confidentiality for minors.

Responsibilities as the Medical Student: Much like other clerkships, your responsibilities will vary depending on whether you are on inpatient or outpatient service at the time. On outpatient days, you will interview patients and present cases to a resident or attending. On inpatient service, you will follow two or three patients a day, pre-round on them, write notes, and participate in rounds. Many sites have “family-centered rounds” on the peds wards, during which the whole medical team will enter the patient’s room, and a student/resident will present the patient case with the family there; family members are encouraged to fill in holes in the history and ask questions. Presenting a case in front of the patient and their family can take practice, because you want to minimize medical jargon and be careful with your wording regarding the plan/prognosis.

Doing Well in the Pediatrics Clerkship: A large part of doing well in pediatrics involves your interactions with the patient’s family. If the family doesn’t like you, it will be evident to your attending. Don’t upset Momma Bear. Additionally, the art of interviewing pediatric patients takes practice. When you walk into a room, introduce yourself to the parent first and then the child. Address the child, ask them questions, engage them in whatever conversation you can in order to establish trust. This will make your physical exam go much more smoothly. If a child doesn’t like/trust you, they will scream and kick and do whatever else is necessary to prevent you from doing a good exam.

Shelf Exam: Pediatric patients really aren’t just small adults, so don’t rely on adult medicine textbooks for all of your studying. The peds Shelf typically emphasizes developmental milestones and preventative care.

Good resources for the Shelf:

- *Pocket Pediatrics* - great for carrying around in your white coat
- *Blueprints* - great overview for the clerkship
- *First Aid for the Pediatric Clerkship*
- *Pretest* - Useful question book
- *Case Files*

- *Harriet Lane Handbook* – good white coat quick reference book
- *Appleton & Lange*

Other tips for the Pediatrics Clerkship:

- Carry a copy of the Vaccination Schedule Card and Well Child Development Milestones with you.
- Some students carry stickers or cute bandaids in their white coats for giving to the younger kids.
- If you get yelled at by parents (especially those of chronically ill children), don't take it personally.

OB/GYN Core Clerkship

Overview: The OB/GYN clerkship is 6 weeks in length and includes a mix of outpatient, inpatient, and surgery. It is this variety of day-to-day activities that attracts many physicians to the OB/GYN field. Most sites will give you at least some exposure to all aspects of OB/GYN, including routine well-patient visits, labor and delivery, maternal-fetal medicine ('high-risk' obstetrics), reproductive endocrinology and infertility, and gynecologic oncology.

Responsibilities as the Medical Student: Responsibilities vary according to the service you are on. In the outpatient clinic, you may be able to interview a patient and present the case to a resident or attending, much like any other clerkship. Gyn Onc is very surgically-intensive, so you will likely spend most of your time in the OR. Experiences on labor hall can vary. Some sites/attendings will let you do a lot during a vaginal delivery, and others want students to just stand back and watch. Regardless of your role during a birth or surgery case, you will want to follow those patients and pre-round on them.

You can get a lot of your required procedures done during OB/GYN, such as wet mounts, pelvic exams, urinalysis, and rectal exams.

Doing Well in the OB/GYN Clerkship: Doing well in OB/GYN is similar to other clerkships. While on the surgery or gyn onc service, do everything that a Surgery clerkship would expect of you. While on the outpatient service, do everything that a Medicine clerkship would expect of you. And don't drop any babies.

Shelf Exam: Our (and Dr. MacNeill's) advice is to read the *Beckman* textbook (it's the same *Beckman* that is recommended for the Repro block in M2). This textbook is not very long and is very readable. If you read this book and do the

UWise practice questions (see below), you will do well on the Shelf.

Good resources for the Shelf:

- *Beckman* - see above
- UWise question database - A fantastic resource! This is a website that has over 500 questions that are written in the same format as the Shelf questions, and that cover all of the pertinent topics. Students get access to this site for free. You will get more information at orientation.
- *Blueprints* - Many students have recommended this in the past
- *Pretest* – most liked this book for questions, though they are not necessarily the same format as those on the Shelf
- *Case Files*
- *First Aid*

Other tips for the OB/GYN Clerkship:

- Carry a pregnancy wheel in your white coat
- Good procedures to get done during OB/GYN: IVs, Foleys, injections

Medicine Core Clerkship

Overview: Medicine is an important clerkship even if you don't do into a Medicine residency. Many competitive residencies (derm, ophtho) will want to see that you did well in your core Medicine clerkship. Medicine is 8 weeks: 4 weeks are spent in an inpatient setting at Hershey or affiliate sites, and the other 4 weeks are spent doing two two-week outpatient selectives at the Hershey Med Center.

****Insider Tip:** Med Ed will typically assign you to your first and last ranked selective choices for your outpatient Medicine month, so if you really don't want to rotate through a particular clinic, rank it somewhere in the middle.

Responsibilities as the Medical Student: Medicine has very long hours in the inpatient weeks. You may be given two or three patients as exclusively 'yours.' If none are assigned to you, take ownership of a few patients. In the busier locations like Hershey, you may be one of several students working with several residents, in which case you will have to be proactive in asking your team what you can do to help. You will focus on patient management during Medicine, and you may not have time to do any of your required procedures because you spend so much time rounding while the nurses do procedures.

Doing Well in the Medicine Clerkship: Medicine is very centered around patient work-up and case presentations. Do really thorough histories and physicals. Learn

how to give an organized, thorough presentation, and your attending will be impressed. Include everything in your case presentation unless your attending asks you to skip it. For example, this means reporting all the vital sign values instead of saying “vital signs normal,” and reporting pertinent negatives on the physical exam instead of saying “rest of exam was unremarkable.” Don’t be wishy-washy in your assessment of a patient. After stating the facts, give a conclusion. Give your opinion and show that you are reasoning through the case. The students that do this get Honors.

Unfortunately, students do get ‘pimped’ a lot during rounds on Medicine, depending on your site and the attending you are working with. Rounds are teaching sessions as much as they are patient care sessions. You may be asked to give a complete differential for abdominal pain, or list 40 different reasons a patient could have hypokalemia. This means that more than any other rotation, you must do extensive reading on your patients’ diseases and have a good understanding of physiology, pathology, and pharmacology.

Shelf Exam: As mentioned above, your best bet for much of your reading will be *Harrison’s* or a similar text. However, be sure to consult a review book as well. Your patient population will not be diverse enough to cover all the topics on the Shelf. The Shelf is difficult and covers a large range of subjects.

Good resources for the Shelf:

- *Internal Medicine Essentials for Clerkship Students, Version 2* - This book is written by the same people who write the Shelf exam questions. It is not extremely thorough, so you may need to use *Harrison’s* or a similar text as a supplement. The free PDF version of this book is available through the Library.
- *MKSAP question database* - Put together by the same people who write the Shelf exam, this database has several hundred questions. The latest version is Version 5, but Library has Version 4 available to students for free. Ask the Library for the CD that has the program on it. We recommend you do all of these questions.
- *First Aid for Medicine*
- *Pretest for Medicine*
- *Case Files*.
- *Pocket Medicine* is very useful to carry in your white coat

Family Medicine Core Clerkship

Overview: The Family Medicine clerkship has the most variety of locations where

you can do the clerkship and thus a wide variety of experiences that you can have during this month. There are at least 20 different sites throughout Pennsylvania. The following website has links with a small description of the program and what your specific duties will be for that location (<http://www.pennstatehershey.org/web/fcm/education/students/locations>). The experience can vary from strictly outpatient experiences to a combination of outpatient and inpatient experiences, as well as whom you will primarily be interacting with on a daily basis. The locations that have both inpatient and outpatient requirements are Johnstown, Lancaster, Middletown, Lebanon, and Altoona.

Responsibilities as the Medical Student: For outpatient experiences, your typical hours will be the hours of the clinic. Some offices have evening hours, but usually students aren't required to work in the evenings. You will most likely have one required or optional call at the sites where there is an inpatient requirement. If you are in the MD/PhD cohort, then you will have this clerkship toward the end of M3, so you should be pretty self-sufficient in interviewing/assessing/presenting patients. You may be able to get a lot of your required procedures done during Family Medicine.

Doing Well in the Family Medicine Clerkship: This clerkship deals largely with the bread and butter of medicine, so reading up on common conditions (diabetes, hypertension, dyslipidemia, pharyngitis, etc) is a good idea. This clerkship focuses more on preventative health measures than others, so ask your patients if they are up to date on vaccinations (especially the flu vaccine), mammograms, pap smears, colonoscopies, etc.

Shelf Exam: This exam is not actually a Shelf exam; it is Penn State's own test that they base on a series of computer cases (you'll get more info at orientation). If you read the cases like you are supposed to, you will do fine on the exam.

Good resources for the Shelf:

- Online cases - These are found on ANGEL and are required for the rotation. You will get more info on these at orientation.
- *Blueprints* - pretty handy
- *Essentials of Family Medicine* - some students liked it, others didn't. Helpful to read about specific clinical experiences.
- *NMS Family Medicine* - A question and answer book that is pretty decent
- www.familypractice.com is a website that has a ton of questions on it, for free.
- Some students recommended using the same question books that you used for

the Medicine Shelf.

AHEC

AHEC is a Pennsylvania state program which requires PA medical students to do a primary care rotation in an underserved area in the state. There are three geographical areas where students are sent: Northwest, North Central, and South Central. You may pick your region of choice, but you should try to get a location as close to PSHMC as you can within that region. Most students are sent far enough away from Hershey that they cannot commute every day, but luckily most AHEC sites will arrange housing for you**. The AHEC rotation does not have a Shelf exam, but Penn State has its own exam for it. The exam format will be like the IPA exams you've had previously in M1/M2, so you probably don't need to do any studying for it (especially if you have already had several other clerkships). AHEC also has some extra assignments you must complete, including another patient project and several presentations. You will get more information during M3, and you will not be assigned to your specific location until a week or two before your AHEC month begins. Some students have pretty relaxed experiences, and others are extremely busy for the whole month.

Psychiatry Core Clerkship

Overview: Psychiatry is 4 weeks long, and is a much more important clerkship than you might think. In patient care, psychiatry is everywhere. Around one-third of inpatients will get 'confused,' and you need to determine if it is delirium, dementia, mental illness, or simply old age. During this clerkship you will gain exposure to thinking about the way people look and act when sick. You will also ponder the sometimes murky continuum of what qualifies as 'normal' and 'abnormal.' Since laboratory tests and scans cannot identify mental illnesses, a good physician learns to act as a diagnostic instrument by listening, examining, interacting, feeling, and struggling with patients.

Your Psychiatry clerkship may be a mix of inpatient and outpatient, with a fair amount of consults. A large number of hours in the weekday afternoons are dedicated to lectures and discussion groups on topics in psychiatry.

Responsibilities as the Medical Student: Typically, students will have one primary assignment in the inpatient psychiatric hospital setting or the consultation-liaison psychiatry service in the medical hospital, and then spend part of the day at substance abuse treatment groups, the inpatient consult service, an outpatient

office, and the electroconvulsive therapy suite. The hours on the Psychiatry clerkship are generally 8AM to 5PM, with one or two call nights during the month. Weariness comes more from the emotional toll of the work than from the amount of time spent on patient care. There's usually plenty of time to read and study.

Doing Well in the Psychiatry Clerkship: Be present... genuinely present. Ask questions and remain open to all answers that you may hear. Make the effort to truly understand your patients and the meaning of human behaviors. Be curious rather than threatened. Also, find and print out a guide for how to write a psychiatry-specific H&P, because it is very different compared to other rotations.

Shelf Exam: The Psychiatry Shelf is notoriously heavy on drugs and diagnosis. For drugs, focus on specific drugs, not just classes. Learn the side-effects and contraindications for each one. You will also need to essentially memorize parts of the DSM-IV, because the Shelf will ask you to make diagnoses based on very long clinical vignettes. Differentiating some of the diseases can be challenging.

Good resources for the Shelf:

- The clerkship gives each student a copy of the DSM-IV manual and *Psychiatry Case Files*
- *First Aid* - most students polled used this text
- *Blueprints* - pretty good to supplement
- *Appleton and Lange*
- *Pretest*

3RD YEAR ELECTIVES

You have approximately two months of elective time during M3. ‘Research’ electives count towards this requirement. You can take a research elective if you need to finish thesis/paper revisions, or if you want to do research in another field (this can be a good idea if you want to pursue a competitive residency but have never done research in that area). But keep in mind that if you take a research elective or start M3 late because of thesis delays, you will then have less time to explore different clinical electives.

VACATION DURING 3RD YEAR

During your M3 year, you should get the official HMC-designated holidays off. This means you get one day off for each of Labor Day, Thanksgiving, Memorial Day, and Independence Day. Two weeks of vacation is built into the M3 schedule at Christmas/New Years’ time. If you want to take more vacation during M3, you will have to use an elective block to do so, but again, this is not recommended because you will need as much vacation time as possible during your 4th year to interview, take boards, etc.

FOURTH YEAR OVERVIEW **Curriculum may change*

Phase 3 - Discovery				
Translational Medicine	May	June	July	August
	Elective or research	Elective or research	AI	Elective

Phase 3: Provides students with the opportunity to explore career options, perform research or scholarship or remediate course work

Phase 4 – Residency Preparation Phase										
Sept	Oct	Nov	Dec		Jan	Feb	Mar		Apr	
Elec	Vacation or study for Step 2	Critical Care, T&R or EM	Basic science or Diagnostic Selective	Winter Break	Interviews	Humanities	Vac	Intern Boot Camp	Elec	Graduation

Phase 4: Tailor-based on residency selection and individual interests: Includes AI's, outside electives, humanities requirements, advanced basic science selectives and "Intern Boot Camp"

Key: T&R: Triage & Resuscitation

EM – Emergency Medicine

FM – Family Medicine

During M4, students have much greater flexibility in scheduling rotations than compared to M3. Required courses include Neurology, Humanities, and two Acting Internships (AIs). You have five months of elective time and are required to complete five electives total (including those in M3). Clerkships in M4 do not have Shelf exams (with the exception of Neurology, which has an exam). Instead of spending your free time studying like you did in M3, during your M4 year you will be spending a lot of time on residency applications.

When creating your 4th year schedule, consider your timeline for residency application and interviews. You will need to complete important electives and AIs by August/September in order to get the relevant recommendations in time for residency applications. For the Early Match, this timeline is even tighter. Also consider when you will take Step 2 of the USMLE (more on that below), as well as when peak residency interview months will be (see section on Residencies).

REQUIRED 4th YEAR CLERKSHIPS

<http://www.pennstatehershey.org/web/educationalaffairs/home/yearfour>

***If you have kids, talk to the AHEC directors. They will make an attempt to assign you to a spot reasonably close to Hershey so that you can commute.*

Acting Internships (AIs)

Acting internships are rotations where medical students act as first year residents (interns). AIs essentially assess students' ability to function as interns. During

AIs, students take on greater responsibilities and are given a set of patients for whom they are responsible. Students also round and take call just as the residents do, so the hours are usually pretty grueling.

You will need to complete two AIs during your 4th year: one surgical and one medical. Try to complete at least one of these as soon as possible so that you can use the recommendation for your residency application. If you know you will be pursuing a surgical residency, then be sure to complete your surgical AI by August/September and get a recommendation from it - the same goes for Medicine/Pediatrics residencies. A good recommendation from an AI is essential for your residency application.

Humanities

In order to graduate, students are required to fulfill one Humanities elective. Humanities is typically offered in September through November and February through April of M4 only. Each course has about 20 to 30 students, and the classes range from class discussions on end of life care to using art as a therapy for patients. Humanities courses are designed to be only half-time so that students can use the rest of the time for interviews or studying for Step 2.

Attendance during M4 clerkships:

As in 3rd year, attendance is mandatory during each M4 clerkship. Because it is your 4th year, you will have to worry about balancing your clerkship schedules with residency applications and interviews. During AIs, you are allowed up to five days of excused absences (per month) for interviews. Because humanities courses have classes only twice a week, you are expected to be able to work around the class schedule, and missing classes may put your grade in jeopardy.

Unofficially, it is possible to negotiate with your clerkship director if you will have to miss more than five days for residency interviews. We have never actually heard of an instance where a clerkship director refused to excuse a student for an interview. Talk to your site-specific director for the rotation, not the Hershey director. If you address the issue ahead of time and offer to make up the missed days, you will likely be able to work things out. Clerkship directors are especially lenient if your reason for missing days is to attend residency interviews in their same field. So if you are applying to Pediatrics residencies, then scheduling a Pediatrics elective during an interview month may actually give you some wiggle room. You may have to make up for missed time by taking more call, or coming in on some extra weekends.

Away rotations

Doing rotations at other institutions is a great way to get a feel for how residency programs may vary within the same field as well as to evaluate a particular program. Doing an away rotation in the field that you are applying to shows how interested you are. Perhaps most importantly, away rotations can be a sort of ‘extended interview’ if you are particularly interested in a program, because they know you, you will be more likely to be selected for an interview or ranked high on the match list. Generally, it’s not essential that you do away rotations before you submit your ERAS application. Rank lists are submitted in mid-February, so any away rotations that you do up until February can help you.

Away rotation applications go through a web system called VSAS. In mid-M3, Diane Gill will activate your VSAS access and send you a password to get into the system. You may then start filling out the application. Most schools participate in VSAS. The ones that don’t will have their own application process. Away rotations must be approved by the MD/PhD Residency Advisor.

USMLE STEP 2

Step 2 of the USMLE has two components: Clinical Knowledge (CK) and Clinical Skills (CS). The 2013 fees for these exams are \$560 and \$1,200, respectively. Diane Gill in Student Affairs is your main contact person. Students will receive information in the mail or email explaining registration and locations for taking the exam.

Step 2 CK

The CK part of Step 2 is the written computer exam, much like Step 1. It has 346 multiple-choice test items, divided into eight 60-minute blocks, administered in one nine-hour testing session. You must take Step 2 by December 31st of M4 in order to graduate from Penn State. Note that taking Step 2 before submitting residency applications is not necessarily required. Many residency programs will not wait to see your Step 2 scores before they send out interviews. Deciding when you take Step 2 will depend on the type of residency you are applying to as well as how competitive your Step 1 score is. If your Step 1 score is not great or just average, then you will need to do well on Step 2 and have the scores back before you submit your ERAS application in order to be competitive for residencies. Many students even take a month of vacation during the summer after M3 to study for Step 2. Conversely, if your Step 1 score is very good, then you can wait and take Step 2 later in the fall. But remember that even if you wait until the last

possible day to take Step 2 (December 31st), residency programs will still receive your Step 2 scores before they make their rank lists in February, so it is not an exam you can blow off.

In preparation for Step 2, most students use their review books from the shelf exams, since the question formats are similar. Additionally, nearly all students recommend doing practice questions and full-length practice tests. Popular sources of practice questions are Kaplan and USMLE World.

Step 2 CS

The CS component tests your ability to complete a history, physical exam, and assessment of patients. It is formatted much like the OSCEs that you will take at Penn State - you will see standardized patients and do a complete workup of each one. Step 2 CS has 12 patient cases. You will have 15 minutes for each patient encounter and 10 minutes to record each patient note. If you do not use the entire 15 minutes for the patient encounter, the remaining time will be added to the time you have to record the patient note. The testing session is approximately eight hours.

Step 2 CS is not difficult. You do not need to study for it, because your experience in M3 clerkships will prepare you. Just be sure to familiarize yourself with the format of the sessions and the structure of the patient notes that the test will require you to write; the OSCEs will help you with this preparation.

Step 2 CS exams are only offered in certain locations around the United States. The closest site to Penn State is in Philadelphia. Our advice is to schedule Step 2 CS as early as possible in order to get a spot in Philadelphia, because they fill up quickly. If you get stuck taking Step 2 CS elsewhere, expect to cover travel/lodging expenses for a day or two.

MENTORING AND COUNSELING DURING M3/M4

Drs. Baccon, Parent and Thiboutot serve as the residency advisors for students in the MD/PhD program in M3 and M4. They can advise students on arranging their clinical rotation schedules and applying for and seeking out residency programs. They can also help students explore the different types of residency programs that are available, including fast-track programs that provide clinical/research opportunities for physician scientists. You are required to meet with one of them at least once per year. Choose one at the beginning of M3 and notify the MD/PhD

Program office who you have chosen.

If you know what type of residency you will be applying to, find a mentor in that field! Start by contacting the clerkship director for that program at Penn State - they will help you determine how competitive your application is and advise you on which particular programs to consider. Your mentor may know which programs have the best research-track residencies. They can also give feedback on your personal statement. If you are especially friendly, they may even call some program directors at other institutions to promote you.

The Co-Directors meet with students once or twice during M3 to discuss the transition to M3, and to review the student's M4 schedule and plans for seeking out appropriate residency programs. During M4, the Co-Directors meet with students at least once to review their progress in the residency match process.

M3/M4 is a very stressful time for students. If you find that you need to talk to someone, Dr. Blackall (GBlackall@psu.edu) is still available as a free, confidential resource for students. If you are being treated inappropriately by a resident or attending on a clerkship or have a conflict that you would like to discuss, contact the ombudsmen: Dr. Frauenhoffer (EFrauenhoffer@psu.edu) and Dr. Levine (RLevine@psu.edu). Meetings with the ombudsmen are also strictly confidential.

APPLYING TO RESIDENCIES

KEY POINTS TO REMEMBER:

- Try to decide early in M3 what specialty you want to pursue. When you do decide, plan ahead for the application process.
- Find a mentor in your chosen field to help you evaluate your application's competitiveness for various programs.
- Do important rotations/AIs before September of M4 so you can get those recommendations
- Get as much of your application done in ERAS as early as possible, even if you are still missing a few recommendations or haven't taken Step 2. Many residency programs will start sending invitation interviews before applications are complete.
- Start saving money now for interviews. Traveling gets expensive.
- When evaluating programs on interviews, talk to the residents!

THE MATCH SYSTEM

National Resident Matching Program (NRMP, aka 'Regular Match')

Most residencies and fellowships use the Regular Match through the National Resident Matching Program (<http://www.nrmp.org/>). In this system, ERAS applications open September 1st, interviews occur in November/December/January, rank lists are finalized in February, and Match Day is in March.

San Francisco Match (aka the 'Early Match')

A few residencies use the Early Match (ophthalmology, urology and peds neuro). The Early Match has an accelerated timeline, so applying to the Early Match involves deciding on a specialty early in M3 and then being very pro-active about getting your application materials together. Interviews will typically start in October and peak in November and December for the Early Match.

Couple's Matching

The Couple's Match is a system by which two individuals applying for residency in the same year can match to the same general city/area. You can enter the Couple's Match with anyone you want, be it your spouse, significant other, or best friend. Going through this match can be difficult – if you and your spouse are

applying to different residencies, the same institution may not have competitive residencies in both of your specialties. On the flip side, if you are applying to the same residency, then it can still be difficult to match to the same institution, especially small programs, because you two would be taking vacation at the same time (thus reducing their workforce by two in the same week). Thus, generally the Couple's Match attempts to match a couple in the same geographic area, not necessarily the same city or institution.

THE APPLICATION PROCESS

The most important first step in the application process is to find a mentor in your chosen field. This will most likely be the residency program director for that specialty at Hershey (not the clerkship director), but you may find other mentors as well. A good mentor will tell you what certain programs are looking for, and how competitive your application is. He/she should also proof your personal statement and give you feedback. If you are especially charming, he/she may also make some phone calls to programs on your behalf. As soon as you decide on a specialty, go seek out a mentor.

Electronic Residency Application Service (ERAS)

ERAS is like AMCAS for residency. You can submit your ERAS application starting September 15. Sometime in the summer after M3, the Dean's office will give you a 'token' number for your ERAS application. You will be able to register with the MyERAS website starting July 1st. After you register with MyERAS, you can fill out the application sections (education, work experience, community service, research experience, etc). As you fill this out, ERAS will create an electronic CV for you that will be sent to residency programs.

You will then upload your personal statement(s) to the website. All of your recommendations get sent to Student Affairs office. Be sure to provide your recommenders with your ERAS application number so that they can include it in their recommendation. The Student Affairs office will upload all of your recommendations to ERAS. For more info on recommendations, see below.

You will then add the programs to which you would like to apply. At this time, you can customize which Personal Statement and which recommendations you would like to send to each program. Try to have everything uploaded and all your programs selected before September 1st, so that day all you have to do is hit "Submit."

ERAS costs are according to the number of programs you apply to in one particular specialty. The costs for 2011 are:

Up to 10: \$75

11-20: \$8 each

21-30: \$15 each

31 or more: \$25 each

This is a per specialty cost, so if you decide on a specialty that you need to have a prelim year, you will be spending more. For example: you want to apply to 20 Dermatology programs and 10 Prelim-year programs. That would cost you \$155 for Derm and \$75 for the Prelims.

Selecting programs:

Each residency specialty has guidelines for the optimal number of programs to apply to. The more competitive residencies will require that you apply to more programs in order to be sure you match. For more information about specific residency guidelines, see the section on residency profiles.

Personal Statement:

Your personal statement is an important part of your application because it is the one area over which you have complete control. It is where your passion for medicine and research should show. You will need to start writing it as soon as you decide on a residency specialty, and revise, revise, revise. It is essential that you give it to your residency mentor, the department chair, and the MD/PhD co-directors for feedback and proofing.

In terms of the content of your personal statement, subtle differences may exist for what each specialty looks for. However, most residency directors will tell you to include the following information: what got you interested in the field that you have chosen; what are you looking for in a residency program; and what are your expected goals in the field you have chosen.

As for writing style, we give you these top three tips:

1. Be yourself
2. Be specific
3. Be brief (one page maximum)

By “**yourself**,” we mean that you should tell the reader what your interests are for specialty, and why your interests are what they are. To do this, pick a few **specific** examples of experiences you’ve had that will help to illustrate your ideas. You

don't need to list all your extracurricular activities (they are already in your application), just elaborate on one or two that really affected your career path or research interests. While your personal statement is the place to show your awesome, unique self, it is not the place to be unique for the sake of the "wow factor." You got away with doing that for college or medical school entrance essays, but for residency applications **professionalism and sincerity are the best routes to take**. And finally, do not ramble. Readers will have to sort through hundreds, if not thousands, of personal statements. Keep it to one page maximum!

Note that you can have more than one personal statement, and you will be able to choose which version each residency program receives. This is especially useful if you are applying to a very competitive specialty (e.g. derm) as well as a 'back-up' specialty - you can have two separate personal statements, one for derm programs and one for your backup programs.

Recommendations

Different residency types and programs have different requirements for recommendations. Most programs ask for three recommendations, but will allow you to submit one or two in addition.

If you connect with an attending on any given rotation, ask for a recommendation!! Chances to create close relationships with attendings will be few during some rotations because you rotate through so many clinics, and your assigned attending may change from day to day. You never know what your future rotations will be like, so if you have a chance to get a good recommendation, jump on it immediately. And if an attending ever offers to write you a rec before you ask, by all means accept!

Also remember that you can upload as many recommendations to ERAS as you want. You will choose which recs to send to each program you are applying to. It doesn't hurt to have several recs to choose from, so when in doubt, ask for a rec from someone. When you have your Dean's interview in the fall of M4, they will often hint to you as to which recs in your file sound the best.

If your recommender knows how to write a good recommendation, he/she will ask you for a copy of your CV, a draft of your personal statement (if you have one at the time), your ERAS token number, and any other relevant materials. If they don't ask for these materials, give them copies anyway. It's sometimes helpful to include a small head-shot of you, lest they procrastinate and then forget who you are. They may ask you if you want your rec to be 'focused' or 'un-focused,'

meaning whether you want it written as though you already know what specialty you want to pursue, so they can say “Sarah will be an excellent pediatrician,” or if you want them to be more general, like “Sarah will excel in any field she chooses; she will be an excellent physician.” Both styles have pros and cons; consult your residency mentor for guidance. Finally, always always always waive your right to read the rec! If you are nervous about its contents, then you shouldn’t be asking that person for a rec anyway. It is a huge red flag to residency programs if you do not waive your right to read your recs.

Who to ask for recommendations:

- Your first recommendation should be **your thesis research advisor** - if you don’t have one from your advisor, it will look odd.
- You need at least 1 recommendation from **a physician in the field you are applying for**. However, if you are applying to Pediatrics, a recommendation from someone in Medicine *might* suffice, and vice versa.
- Some residencies (such as surgery and medicine) require a recommendation from the **department chair at your school** - if you are applying to such a residency, get to know your Hershey department Chair asap. Schedule a meeting with them, let them know which faculty and residents at Penn State that you’ve worked with during clerkships so that they can ‘get to know’ you from the feedback from these individuals
- The best recommendations come from **people who really know you** – who you are, how you interact with patients/staff, how you handle pressure or long hours, etc. If you have to choose, it is always better to choose the recommender who knows you the best over the recommender who is just a big name in the field, but doesn’t know you at all. The worst kind of recommendation is a generic letter.
- When asking someone for a rec, be sure to also ask if they feel that they can write you an excellent recommendation. If they hesitate, or say “no,” take the hint and don’t press them for a rec, because it will likely be a bad one.

When to ask for recommendations:

- The earlier, the better. Ask at the end of the rotation, while the attending still remembers who you are. If you wait several months after your clerkship to ask for a rec, they may not remember you.
- If you know you want to pursue a particular specialty, it never hurts to be up front about it while you are doing that particular clerkship. Mention that you are interested in Specialty X and would like to get a recommendation out of the clerkship.
- You do not necessarily have to have all your recs uploaded to ERAS before

September. As mentioned before, many residency programs will send out interview invitations before your application is complete.

Interviews

Once you submit your application, you will be hearing from programs inviting for interviews. This will typically start in November and peak in December/January for regular match. For the competitive specialties like ophthalmology and dermatology, most programs will only interview applicants on two or three dates (some even only one)! So, it is an imperative that you take a vacation month or a very light rotation during that time to make your schedule very flexible.

Interview costs: In addition to being time consuming, this process will be expensive, so start saving now! Because many MD/PhD students apply to competitive residencies, they apply to a high number of programs and go on a high number of interviews. Many of our students have reported spending \$5,000 to \$12,000 on traveling/lodging for interviews. Nonetheless, you should plan on going on as many interviews as possible (as invited) to maximize your chance of matching. And don't forget that you'll need to buy an interview suit, unless you are lucky enough to fit into your medical school interview suit from 8 years ago.

The Financial Aid office has information on banks that are willing to give personal relocation loans that can be used for interviewing costs, but beware the interest on those is hefty.

Interview preparation: The interview experience takes some preparation, but it is not stressful as you think going in. But regardless of how much preparation you have done, your first one or two interviews will be nerve racking. Scheduling a mock interview before your first interview is a good idea, and can be done with your in-specialty or out-of-specialty advisor. There are lists of the common questions on the internet ("Tell me about yourself," or "Tell me about your research," or "Why do you want to be an ophthalmologist"). Practice answering these ahead of time. You should also anticipate the un-anticipated questions ("Tell me your two favorite kinds of beer and compare and contrast the two" was actually asked in an interview by a residency director who is a beer connoisseur). Finally, always have a question ready for the interviewer - the most difficult and annoying question on the residency interview trail has been "Do you have any questions for me?" Ask a question, any question, even if you already found out the answer somewhere else, just to look interested in the program.

Keep in mind that however much a residency program is "research oriented," you

are still interviewing for a clinical position. Some of your interviewers will be straight clinicians who don't care about your PhD. By all means, ask about residency research opportunities on your interviews, but the programs' residents may have more truthful answers than your interviewers.

THE RANK LIST

After you go on interviews, you will rank your programs using the NMRP rank list. Registration with NRMP is \$50. This gives you:

- Access to the NRMP site
- Processing of up to 20 different program ranks on the primary rank order list at no additional cost (for each additional program over 20, the fee is \$30 per program)
- Processing of up to 20 different program ranks on supplemental rank order lists at no additional charge, regardless of the number of supplemental rank order lists having combinations of those programs (for each additional program over 20, the fee is \$30 per program)
- Each partner of a couple may rank up to 30 different programs on the primary rank order list and up to 30 programs on all supplemental lists combined at no additional charge. Each partner of a couple also must pay an additional \$15 registration fee.

Primary Rank Order Lists

1 to 20 programs ranked: No Charge

Each additional program over 20: \$30 per program ranked

Secondary Rank Order Lists

1 to 20 programs ranked: \No Charge

over 20: \$30 per program ranked on all supplemental lists combined

Your final rank list is due sometime in February of your last year. You will rank programs in order of preference and enter them into the NRMP website. Just like the rest of the application process, the order of programs is a very personal decision which may be based on geography, personal factors, professional factors, etc.

THE MATCH ALGORITHM

Generally, the more programs you rank, the better chance you have of matching.

The number one reason that applicants do not match is that they did not rank enough programs. You can only rank programs that you have interviewed with, therefore maximizing the number of interviews will help maximize your chances of matching.

As you create your rank lists, residency programs also create theirs, ranking the candidates that they interviewed in order of preference. Then a fancy computer algorithm matches applicants and programs. For more information about this black box system, see the NRMP website.

The match process matches each applicant with one program. This program that you match to is the program at which you will do your residency. The ***match system is legally binding***, and if you decide that you do not want to attend the program that you matched to, there may be legal ramifications that will affect your medical career. That being said, if you do not want to attend a residency program, do not include it on your rank list!

MATCH DAY

Match Day is the day when every single medical student in the United States (participating in the Regular Match) finds out at the same time where they have matched to for residency. Match Day is always the third Friday in March. All of the M4s are crammed into one of the lecture halls, the envelopes are passed out to each student, and everyone opens their envelope at noon EST. Much laughing, crying, and shouting ensues. Many schools, including Penn State, have big parties on Match Day to celebrate. Penn State's Match results are posted outside of the Student Affairs office on Match Day so that everyone can see them.

IF YOU DON'T MATCH

As of March 2012, individuals who were not matched to a residency position, the NRMP (National Resident Matching Program) debuted the Supplemental Offer and Acceptance ProgramsSM (SOAPSM), a new process developed in partnership with the Association of American Medical Colleges (AAMC) and in consultation with student affairs deans, residency program directors, resident physicians, and medical students. Designed to help streamline, equalize, and automate the process for students who are not matched initially, SOAP replaces the "Scramble," the

unofficial name for the period of time during Match Week when unmatched applicants contact programs with unfilled positions. Under SOAP, the NRMP makes available the locations of unfilled positions so that unmatched students can submit applications for these positions through the AAMC's Electronic Residency Application Service® (ERAS®). After receiving applications through ERAS, residency program directors create a list of candidates in order of preference and the NRMP offers positions in that order in a series of up to eight rounds. Applicants are able to receive multiple offers in a single round; if an offer is accepted, it is binding.

TRANSITION TO RESIDENCY

At the end of M4, it is a good idea to check on the graduation requirements for Penn State to make sure that you have covered everything. Aside from completing your last rotations and going through one last Island week before graduation, there is not usually anything outstanding that you need to take care of. Then, of course, you will be thinking about moving to your residency location – finding a place to live, moving, changing your driver's license, and other such fun things.

Whatever state you are headed to, it is a good idea to check the USMLE rules of the state you will do your residency in, since some states have different rules. Most states require that you take Step 3 within 7 years of taking Step 1. This means that you must take Step 3 before your second year of residency. This is not usually a problem, since most residents take it at the end of PGY-1 or the beginning of PGY-2. Just keep your time-frame in mind.

STUDENT LIFE

STUDENT ORGANIZATIONS

There are many student organizations available for MD/PhD students to join. Since students are both medical and graduate, they are eligible to join any organization. The PSSA is strictly for MD/PhD students (see below). As a graduate student, the GSA is a good choice. Information about student organizations can be found in the Student Affairs web site and also on the bulletin board outside the Student Affairs Office.

PHYSICIAN/SCIENTIST STUDENT ASSOCIATION (PSSA)

The PSSA was organized by the MD/PhD students in 1995 to provide a forum for the discussion of issues relating to physician scientist training and career choices; to educate interested medical students as to the role of physician scientists in medical research and health care delivery; and to promote interest in research among the students and fellow medical students by sponsoring relevant activities and fundraisers throughout the year.

Student Teams

Students are elected during the annual Retreat for various program activity teams. The following teams are responsible for each program activity:

- Recruiting/Interviews – Scott Tucker, Olivier Noel, Sarah Jefferson
- Retreat - Tulasi Khandan, Richard Albertson, Olivier Noel
- Seminar Series – Michal Kidacki
- Steering Committee meeting representatives – Ron Panganiban, Zainul Hasanali
- Newsletter – Paul Hsu, Olivier Noel, Ron Panganiban
- Social Team – Tulasi Khandan, Saumya Maru

UNIVERSITY FITNESS CENTER (UFC)

The UFC is on west campus and was refurbished in 2006/2007. Full membership at the UFC is free for medical, graduate, and nursing students. Memberships for students' spouses and dependents are available for about \$175 a year. Penn State Hershey University

Cardio and Weight Rooms:

The UFC boasts an extensive variety of cardio machines and weights. It is a very good quality gym for the size of the Med Center.

Fitness classes:

Many classes are free for gym members, such as cycling, freestyle cardio, kickboxing, and Muscle Moves weight training. In addition, the UFC offers many 'specialty' classes for a fee – these include Zumba, yoga, tai chi, pilates, Jazzercise, Boot Camp, and many more. See the website for pricing and details.

Full court gymnasium:

The gym is used for basketball, volleyball, badminton, soccer, cricket, and Frisbee. When no activities are scheduled, members are encouraged to use the space for other activities such as individual athletic and skill drills, walking, and shooting hoops solo.

Raquetball and Squash Courts:

Court memberships are not included in the general Penn State Hershey University Fitness Center membership, but they are reasonable. You can pay by the hour, month, or year. Want to play, but don't have the gear? Penn State Hershey University Fitness Center has got you covered with entry-level racquets, balls, and goggles available to UFC court members and guests.

Check out their website for hours, fees, and class information

(<http://www.pennstatehershey.org/web/ufc/home>)

ATHLETICS

Intramural sports: Intramural teams for softball, basketball, and volleyball are common around the Med Center.

Athletic fields: In front of the medical center you will find soccer, baseball, and sand volleyball fields that are free for use by any Penn State affiliated group. Organizations requesting the use of the University's athletic fields must submit a completed "University Indemnification Agreement". This form is distributed by the Assistant Director, Support Services, Gerise Bruzgulis. She can be contacted at 717-531-7075 or via email at gbruzgulis@psu.edu.

Running track: The gravel running track is a .56 mile loop that is located in front of the Crescent adjacent to parking lot A-1.

Campus walking/running routes:

Derry Township Pool:

The Hershey Medical Center does not have a pool, but fortunately Derry Township does.

<http://www.derrytownship.org/index.php/township-departments/parks-a-recreation>

Community Service:

An important mission of the College of Medicine is service to community. The faculty and students take this responsibility seriously and contribute countless hours to a wide range of community and professional service activities.

Over the past year Penn State College of Medicine students have

- Helped sick children smile and laugh,
- Provided companionship for the elderly,
- Cleared hiking trails,
- Supported battered women and their children,
- Worked in third world country health clinics,
- Served as big brothers and big sisters,
- Provided health education to secondary school children,
- Donated blood,
- Provided support to terminally ill patients,
- And administered free medical care to homeless men and women.

Organizations served by our students include

- Big Brother/Big Sister
- Hershey Area Nursing Homes
- Ronald McDonald House

- Child Life - University Hospital
- Shalom House Women's Shelter
- Bethesda Missions Men's Homeless Shelter
- Cenacle Children's Shelter
- Central PA Food Bank
- AIDS Awareness Education Program
- Blood Donation Drive
- Adopt - A - Highway Project
- AIDS Awareness Educational Program
- FPIG Tar Wars Elementary School Program
- Nittany Lions vs. Lambs Relay Fundraiser
- Make-A-Wish Foundation
- Lion Care Student Free Clinic for the Homeless
- Jewish Family Services
- Habitat For Humanity
- Hospice of York County
- Salvation Army
- Special Olympics
- American Cancer Society

The graduate and medical student classes all have their own community service initiatives that you can join.

Leave of Absence:

The medical school and the graduate school each have their own policies/process of requesting/granting a leave of absence. Depending on whether you are in medical or graduate school, you need to follow that process. In addition, since you are an MD/PhD student first, you need to set up a meeting with the co-directors so they are aware of your intent prior to meeting with the graduate or medical school office. The MD/PhD Program will continue your support (stipend, health insurance & tuition) for up to 3 months *exceptions can be requested. If you are requesting longer than 3 months, your support will be discontinued until your return. A target date for return must be set so that all offices are aware of your plans.

Graduate School Policy: <http://infonet.hmc.psu.edu/graduate-education/students/index.htm>

Medical School Policy: see page 27

FOR THE PARTNERS OF MD/PHD STUDENTS

A Letter to the Partners of MD/PhD Students:

Dear Partner,

During their 8 years in the program, your MD/PhD Student will be completing one of the hardest graduate school programs in the United States. You will likely be the primary bread-winner, and also the primary shoulder on which they will cry (or complain). We, the current students, would like to give you fair warning on what you will be dealing with.

During the first two medical school years, your Student will be cramming so much information into their brain that they may forget how to properly form sentences in English. If they fail to remember your birthday, please go easy on them. During the graduate school years, the absence of graded exams will leave your Student clueless (for the first time ever!) as to how well they are doing in school. They will need occasional reassurance of their intelligence and value – please feel free to give them numerical grades on their shoe-tying or laundry-folding skills in order to bolster their self-esteem. Close to their thesis defense, your Student may experience rapid changes in mood and generalized feelings of panic. Don't be alarmed – this is completely normal and will resolve within a few hours after successfully defending their thesis.

Finally, during the last two years of medical school, your Student may disappear for weeks at a time, only to resurface on holidays and Sunday afternoons. Their 'free' time away from the clinic will be spent studying for monthly exams, applying for residency, or interviewing. Please try to avoid any family emergencies and illnesses during these years.

Your Student will be completing one of the toughest educational programs that the world has to offer, and as hard as they might find it, they may not realize how hard they make it on you. Please be gentle when explaining this to them, and remember that one day (but not anytime soon), your Student will actually have a degree and make some money.

Sincerely,

The Current PSU MD/PhD Students

MD/PHD PROGRAM DIRECTORY

CO-DIRECTORS

Robert Levenson, PhD, Co-Director
Pharmacology, HCAR 3307, x4545 or by appointment, C1742J (CTSI)

Leslie Parent, MD, Co-Director
Medicine/Infectious Disease; Microbiology & Immunology, C6860, x3997

MD/PhD PROGRAM STEERING COMMITTEE

Jennifer Baccon, MD, PhD
Pathology, C7628, x8102

Keith Cheng, MD, PhD
Pathology, C7866, x5635

James Connor, PhD
Neurosurgery, C3848, x4541

Patrick Drew, PhD (University Park)
Engineering Science & Mechanics; Neurosurgery
W317 Millennium Science Complex (814) 863-1473

Edward Gunther, MD
Medicine/Hematology/Oncology, C3520, x7022

Faoud Ishmael, MD, PhD
Medicine/Pulmonary & Allergy; Biochemistry & Molecular Biology
C5720, 285567

Kenneth Keiler, PhD (University Park)
Biochemistry & Molecular Biology,
401 Althouse lab, (814) 863-0787

Aron Lukacher, MD, PhD
Microbiology & Immunology, C6800, x6521

Daniel Notterman, MD
Vice Dean for Research & Graduate Studies, C1603, x7199

Melissa Rolls, PhD (University Park)
118 Life Sciences Building, (814) 867-1395

Steven Schiff, MD, PhD (University Park)
Engineering, Science & Mechanics (UP)
Neurosurgery (COM)
212 Earth & Engineering Sciences Building, (814) 863-4210

Christopher Siedlecki, PhD
Surgery/Bioengineering, C4864F, x5716

Diane Thiboutot, MD
Dermatology, C7801, x7437

John Wills, PhD
Microbiology & Immunology, C6712, x3528

MD/PhD PROGRAM INTERNAL ADVISORS

Michael Verderame, PhD (Chair)
Associate Dean for Graduate Education, C1712, x8892

Wafik El-Deiry, MD, PhD
Adult Hematology/Oncology, T4423, x5059

Ross Hardison, PhD (University Park)
Biochemistry & Molecular Biology
304 Wartik Building, (814) 863-0113

Barbara Miller, MD
Pediatrics/Hematology/Oncology, C6716, x1789

Terry Wolpaw, MD

Vice Dean for Educational Affairs, C1708, x3876

Lawrence Sinoway, MD
Medicine/Cardiology, C4516, x6853

Judith Todd, PhD (University Park)
Engineering Sciences & Mechanics
212 Earth & Engineering Sciences Building, (814) 863-7966

MD/PhD PROGRAM EXTERNAL ADVISORS

Lawrence (Skip) Brass, MD, PhD
Director, MSTP
University of Pennsylvania
Philadelphia, PA

Michael Frohman, MD, PhD
Director, MSTP
Stony Brook University
Stony Brook, NY

Kerry O'Banion, MD, PhD
Director, MSTP
University of Rochester
Rochester, NY

TRAINING FACULTY

College of Medicine, Hershey PA

Barnstable, Colin, PhD	Lynch, Christopher, PhD
Bonneau, Robert, PhD	Miller, Barbara, MD
Broach, James, PhD	Norgren, Ralph, PhD
Carrel, Laura, PhD	Robertson, Gavin, PhD
Christensen, Neil, PhD	Schell, Todd, PhD
Craven, Rebecca, PhD	Shantz, Lisa, PhD
Donahue, Henry, PhD	Sinoway, Lawrence, MD

Eckert, Kristin, PhD	Stoute, Jose, MD
El-Deiry, Wafik, MD, PhD	Subramanian, Thyagarajan, MD
Grigson, Patricia, PhD	Undar, Akif, PhD
Hajnal, Andras, MD, PhD	Vrana, Kent, PhD
Katzman, Michael, MD	Yengo, Christopher, PhD
Lang, Charles, PhD	Zhu, Jiyue, PhD

University Park, State College, PA

Albert, Reka, PhD	Jensen, Gordon, MD, PhD
Birch, Leann, PhD	Luscher, Bernhard, PhD
Cameron, Craig, PhD	Mastro, Andrea, PhD
Cavener, Douglas, PhD	Rolls, Barbara, PhD
Chen, Gong, PhD	Tan, Song, PhD
Glick, Adam, PhD	Tutwiler, Richard, PhD
Harvill, Eric, PhD	Vanden Heuvel, John, PhD

GRADUATE PROGRAM DIRECTORS

- **Anatomy**
 - Patricia McLaughlin, PhD
 - Room C3727, x6414
 - Secretary: Dee Clark, C1747H, x287626
- **Biomedical Sciences**
 - Ralph Keil, PhD
 - Room C5715, x8595
 - Secretary: Karen Shields, C3850, x1045
- **Bioengineering**
 - William Weiss, PhD (at Hershey)
 - Room C4864, x6228
 - Secretary: (tba)
- **Engineering Science & Mechanics/MD/PhD joint program**
 - Judith Todd, PhD
 - University Park
 - 212 Earth & Engineering Sciences Building, (814) 863-7966
 - Secretary: (tba)

- **Integrative Biosciences Options:**
 - **Bioinformatics & Genomics**
 - Keith Cheng, MD, PhD
 - Room C1712, x8982
 - Secretary: Kathy Shuey, C1712, x8982
 - **Neuroscience**
 - Patricia Sue Grigson, PhD
 - Room C1716, x5772
 - Secretary: Kathy Shuey, C1712, x8982

ACADEMIC DEANS

Senior Vice President for Health Affairs Dean, Penn State College of Medicine

Harold L. Paz, MD, MS

Executive Director, Penn State Hershey Medical Center

Alan Brechbill, MBA, MHA

Vice-Dean for Educational Affairs

Terry Wolpaw, MD

Vice-Dean for Research and Graduate Studies

Daniel Notterman, MD, MA

Vice-Dean for Clinical Affairs

A. Craig Hillemeier, MD

Associate Dean for Diversity

Harjit Singh, MD

Associate Dean for Basic Science Research

Sheila Vrana, PhD

Associate Dean of Clinical Education

Eileen Moser, MD

Associate Dean for Clinical Research

Thomas Terndrup, MD

Associate Dean for Graduate Education

Michael F. Verderame, PhD

Associate Dean for Graduate Medical Education

Ronald Domen, MD

Associate Dean of Pre-Clinic Curriculum

Carol Whitfield, PhD

M.S.P.H. Associate Dean for Primary Care

James M. Herman, MD, MSPH

Associate Dean for Professional Development

Ann Ouyang, MD

Associate Dean for Continuing Education
William Henrikus, MD
Associate Dean for Clinical Simulation
Elizabeth Sinz, MD
Associate Dean for Research Innovation
Keith Marmer, DPT, MBA
Associate Dean for Student Affairs & Admissions
Dwight Davis, MD
Associate Dean for Student Affairs
Miland Kothari, MD
Associate Dean for Technology Development
Alan Snyder, PhD
Academic Placements Officer
Catherine Caruso, Instructor
Chief Information Officer
Thomas W. Abendroth, MD
Director, Penn State Cancer Center
(tbd)
Director, Penn State Heart & Vascular Institute
Lawrence Sinoway, MD

ACADEMIC DEPARTMENT CHAIRS

Anesthesia (x6597 - Room C2840)

Berend Mets, MB, ChB, PhD, FRCA, FFA, SA

Biochemistry & Molecular Biology (x8586 - Room C5757) James Broach, PhD

Cellular and Molecular Physiology (x8566 - Room C4600) Leonard S. Jefferson, Jr., PhD

Comparative Medicine (x8460 - Room CG721) Ronald Wilson, VMD, MS

Dermatology (x8307 – Room UPC II 4300) James Marks, MD

Emergency Medicine (x8955 – Room H1239) Thomas Terndrup, MD

Family and Community Medicine (x8187 - Room C1626) James M. Herman, MD, MSPH

Public Health Sciences (x7178 - ASB, Suite 2200) Vernon Chinchilli, PhD
Humanities (x8779 - Room C1743) Daniel Shapiro, MD
Medicine (x8390 - Room C6860) Robert C. Aber, MD 33
Microbiology and Immunology (x8253 - Room C6800) Aron Lukacher, MD, PhD
Neural & Behavioral Science (x8652 - Room C3801) Colin Barnstable, PhD
Neurology (x1803 – Room C5522) David Good, MD
Neurosurgery (x8807 – Room C3830) Robert Harbaugh, MD
Obstetrics and Gynecology (x8629 - Room C3614) John Repke, MD
Ophthalmology (x8783 - UPC, Suite 800) David A. Quillen, MD
Orthopaedics (x4803 - Room C3862) Kevin Black, MD
Pathology (x8246 - Room C7628) Dani Zander, MD
Pediatrics (x6700 - C7840) Barbara Ostrov, MD
Pharmacology (x8286 - Room C7708) Kent E. Vrana, PhD
Psychiatry (x8515 - Room C5604) Alan Gelenberg, MD
Radiology (x8044 - H6300D) Kathleen Eggli, MD
Surgery (x8939 - Room C4612) Peter Dillon, MD

COLLEGE OF MEDICINE COMMITTEE CHAIRS

Academic Progress Committee, Years I and II - (tba)
Academic Progress Committee, Years III and IV - Kevin Black, MD
Biological Safety & Recombinant DNA Subcommittee - Ralph Keil, PhD
Clinical Trials Committee - Gordon Kauffman, MD
Curriculum Evaluation Committee - Catherine Abendroth, MD
CUMED Years I & II - Paul Eslinger, PhD

CUMED Years III & IV - Lawrence Kass, MD
CUMED Oversight Committee - David Spector, PhD
Disaster Planning Subcommittee - Lee Groff
Employee Safety Subcommittee - Brad Williard
Human Use of Radioisotopes Subcommittee - Lawrence Demers, PhD
Infection Control Subcommittee - Michael Katzman, MD
Institutional Animal Care and Use Committee (IACUC) - Robert Bonneau, PhD
Institutional Safety Committee - Steve Mancuso & Charles Ulinfum
The Doctors Kienle Center for Humanistic Medicine - James O. Ballard, MD
Laser Safety Subcommittee - Fred Fedok, MD

CURRENT STUDENT DIRECTORY

M4

Darrin Bann
Leslie Parent
Cell & Molecular Biology

Theresa Carr
Lisa Shantz
Physiology

Daniel Lapp
Colin Barnstable
Neuroscience

Shane Lloyd
Henry Donahue
Cell & Molecular Biology

M3

Marie Shaner Bulathsinghala
Sinisa Dovat
Cell & Molecular Biology

Allison Cleary
Edward Gunther
Cell & Molecular Biology

Eugene Cozza
Todd Schell
Cell & Molecular Biology

Katrina Heyrana
Rebecca Craven
Cell & Molecular Biology

Xiaowei (Bill) Su
James Connor
Molecular Medicine

Diana Tacelosky
Robert Levenson
Pharmacology

G5 (Postdoc)

Cody Weston
James Connor
Neuroscience

G4

Zainul Hasanali
Clare Sample
Molecular Medicine

Lauren Kaminsky
Christopher Norbury
Microbiology & Immunology

Francis LeBlanc
Thomas Loughran

Jeffrey Nguyen
Roselyn Irby

Molecular Medicine

Steven Steinway
Thomas Loughran
Molecular Medicine

G3

Richard Albertson
Melissa Rolls
Neuroscience

Michal Kidacki
Douglas Stairs
Biomedical Sciences

Yanli Wang
James Broach
Bioinformatics & Genomics

G2

Paul Hsu
Yuguang Shi
Biomedical Sciences

Saumya Maru
Aron Lukacher
Biomedical Sciences

Akua Sarfo
John Wills
Biomedical Sciences

G1

Max Castruita
Jose Stoute
Biomedical Sciences

Yifu Ding
Keith Cheng
Biomedical Sciences

Brian Kinsman
Sean Stocker
Biomedical Sciences

Aditya Pisupati
Timothy Jegla (UP)
Neuroscience

M2

Molecular Medicine

Tulasi Khandan
Thomas Loughran
Biomedical Sciences

Ronaldo Panganiban
Faoud Ishmael
Biomedical Sciences

Amy Lu
Colin Barnstable
Biomedical Sciences

Olivier Noel
James Broach
Biomedical Sciences

Eunice Chen
(tba)
Biomedical Sciences

Sarah Jefferson
Bernhard Luscher (UP)
Neuroscience

Derek Nye
Isabella Cattadori (UP)
Biomedical Sciences

Nicholas Sterling
Xuemei Huang
Biomedical Sciences

Sa Do (John) Kang

Monica Manglani

Oliver Mrowczynski

Ruizhe (Jerry) Ren

Tarik Salameh

Scott Tucker

M1

Michael Chen

Kristen Clements

William Davis Haselden

Spencer Katz

Yunsung Kim

Kristin Lambert

Zachary Nolan

Cassandra Ondeck

Heather Schmitz

Andrea Schneider

Mark Varvaris

Carson Wills

ALUMNI DIRECTORY

Paul R. Knight III

MD 73/PhD73

Advisor: Ronald Duff

Microbiology & Immunology

Residency: HMC/Surgery & Anesthesia

Current Position: Director, MD/PhD Program at SUNY, Buffalo, NY

John F. Keiser

MD 73/PhD 74

Advisor: Isabel Barnes

Microbiology & Immunology

Residency: Walter Reed Army Medical Center/Pathology

Current Position: Associate Professor of Pathology, Chief, Microbiology Lab, George

Washington U Medical Center

Norman W. Barton

MD 76/PhD 74

Advisor: Abraham Rosenberg

Biochemistry & Molecular Biology

Residency: Albany Medical College Hospital/Internal Medicine

Residency: Cornell & New York Hospital/Neurology

Current Position: Head of Global Medical Affairs for Shire Human Genetic Therapies in Cambridge, Massachusetts. He also serves the group as senior fellow and disease expert.

Jeffrey T. Whitmer

MD 77/PhD 74

Advisor: John Neely
Cellular & Molecular Physiology
Residency: SUNY Upstate/Pediatrics
Fellowship: Childrens Hospital U of Cincinnati/Pediatric Cardiology
Current Position: Retired

Kirk Shelley
MD 81/PhD 81
Advisor: Alexander McPherson
Biochemistry & Molecular Biology
Residency: Lenox Hill Hospital, NY, NY/Internal Medicine
Residency: Columbia Presbyterian/Anesthesia
Current Position: Director of Ambulatory Anesthesia, Professor of Anesthesia, Yale-New Haven Hospital, CT; President of the Society for Technology in Anesthesia

Judith E. Kalinyak
MD 83/PhD 81
Advisor: John Taylor
Residency: Stanford/Internal Medicine/Endocrinology/Nuclear Medicine
Microbiology & Immunology
Current Position: Medical Director of Naviscan, Inc. San Diego, CA (molecular imaging)

Sherrie B. Feldman
MD 84/PhD 82
Advisor: Mary K. Howett
Microbiology & Immunology
Residency:
Current Position: Dermatologist, Heritage Diagnostics, PA

John J. Marota
MD 85/PhD 83
Advisor: Ross Shiman
Biochemistry & Molecular Biology
Residency:
Current Position: Instructor in Anesthesia, Team Leader in Radiology, Mass. General Hospital, MA; Assistant Professor, Harvard

David L. Griffen
MD 82/PhD 86
Advisor: Ross Shiman
Biochemistry & Molecular Biology
Residency:
Current Position: Chair & Director, Dept. of Emergency Svc. & Emergency Med., Memorial Medical Center, Springfield, IL

Ned Enea
MD 90/PhD 87
Advisor: Theodore Hollis
Cellular & Molecular Physiology
Residency: PSHMC/Diagnostic Radiology

Fellowship: PSHMC/Angio/Interventional Radiology
Current Position: Radiologist, Radiology & MRI of Bethlehem, PA

Richard M. Bardales
MD 91/PhD 90
Advisor: Veer Bhavanandan
Biochemistry & Molecular Biology
Residency: PSHMC/Internal Medicine
Fellowship: Vanderbilt/Cardiology
Current Position: Cardiologist, Capitol City Cardiology, Columbus, OH

George A. Oyler
MD 91/PhD 90
Advisor: Melvin Billingsley
Cell & Molecular Biology
Residency: Johns Hopkins/Neurology
Fellowship: Johns Hopkins/Neurology
Current Position: Adjunct Assistant Professor of Bio and Chemical Engineering, Johns Hopkins;
President, Synaptic Research, LLC, Baltimore

Edwin C. Gillman
MD 93/PhD 90
Advisor: Anita Hopper
Biochemistry & Molecular Biology
Residency: PSHMC/Internal Medicine
Residency: PSHMC/Anesthesia
Current Position: Anesthesiologist, Riverside Anesthesia Assoc., Mechanicsburg, PA

Michael F. Saulino
MD 93/PhD 93
Advisor: Cara-Lynne Schengrund
Biochemistry & Molecular Biology
Residency: Thomas Jefferson U Hospital/Physical Medicine & Rehab
Current Position: Assistant Professor of Rehab Medicine, Moss Rehab Hospital, Jefferson
Medical College, Thomas Jefferson U, Philadelphia, PA

Katherine A. Harris
MD 94/PhD 92
Advisor: Melvin Billingsley
Pharmacology
Postdoc: PSCOM/Pharmacology
Residency: UCSF/Internal Medicine
Fellowship: UCSF/Hematology/Oncology
Current Position: Assistant Professor of Medicine, Penn State Hershey Medical Center, Cancer
Center, PA; Cancer Attending Physician, Lehigh Valley Hospital, PA

Belinda G. Enders Collins
MD 95/PhD 95
Advisor: Michael Smith
Biochemistry & Molecular Biology
Residency: Reading Hospital & Medical Center/Radiology

Current Position: Assistant Professor of Radiology, Penn State Hershey Medical Center, PA

Mary Lynn Fecile

MD 95/PhD 93

Advisor: Mary K. Howett

Microbiology & Immunology

Residency: Floating Hospital for Children, NE Med Ctr/Pediatrics

Fellowship: Baylor COM/Hematology/Oncology

Current Position: Staff Physician, Hematology/Oncology; Director, Pediatric Sickle Cell Program, Penn State Hershey Medical Center, Hershey, PA

William C. Gamberino

MD 96/PhD 94

Advisor: Kathryn LaNoue

Neuroscience

Residency: U of FL COM/Psychiatry

Current Position: Private Practice in Psychiatry, Ocala, FL

Charles P. Venditti

MD 96/PhD 94

Advisor: Michael Chorney

Microbiology & Immunology

Residency: Mass General/Pediatrics

Current Position: Genetic Disease Research Div. of National Human Genome Research Institution, NIH, MD

Soraya Samii

MD 97/PhD 95

Advisor: Russell Scaduto

Physiology

Residency: Internal Medicine/Cardiology, U of Pittsburgh Medical Center

Fellowship: PSHMC/Cardiology

Current Position: Assistant Professor of Medicine/Cardiology, PSHMC, PA

Karen M. Vossen-Smirnakis

MD 97/PhD 96

Advisor: Michael Fried

Biochemistry & Molecular Biology

Residency: Internal Medicine, Mass General

Current Position: Senior Medical Director, Safety & Benefit Risk, Biogen Idec, Boston, MA

Yousif I. A-Rahim

MD 98/PhD 95

Advisor: Elliot Vesell

Pharmacology

Residency: Internal Medicine, Harvard

Current Position: Chief, Interventional Gastroenterology Division, Assistant Professor of Medicine, University of Hawaii, John A. Burns School of Medicine, HI

Timothy O. Leonard

MD 98/PhD 96

Advisor: Ralph Lydic
Neuroscience
Postdoctoral Training: 1998-1999 Pathology, Penn State Hershey Medical Center
Residency: 1999-2000 Pathology, Penn State Hershey Medical Center
2000-2004 Assistant (00-03) Associate Professor (04) of Biology, Houghton College, NY
Fellowship: 2006-present U of PA/Pathology
Associate Professor of Pathology, West Virginia School of Medicine
Current Position: Associate Dean for Biomedical Affairs; Associate Professor Dept. of Patho-Physiology & Pharmacology, Liberty University College of Osteopathic Medicine, Lynchburg, VA

Padmanee Sharma
MD 98/PhD 97
Advisor: Michael Chorney
Microbiology & Immunology
Residency: Internal Medicine, Cornell Medical Center
Current Position: Assistant Professor of Medicine/Genitourinary Medical Oncology, U of Texas M.D. Anderson Cancer Center, TX

Gregory Q. Miranda
MD 00 (did not earn a PhD)
Advisor: Gary Clawson
Biochemistry & Molecular Biology
Residency: Pediatrics, U of Colorado Health Sciences Center, Denver, CO
Current Position: Housestaff, Pediatrics, Denver Health System, CO

John J. McAllister
MD 02/PhD 00
Advisor: Brian Wigdahl
Cell & Molecular Biology
Residency: Anesthesia, U of Virginia Medical Center, VA
Current Position: Private Practice Anesthesia Group affiliated with Anne Arundel Hospital, Annapolis, MD

Richard A. Conn
MD 03/PhD 03
Advisor: Melvin Billingsley
Pharmacology
Residency: Family Practice, Latrobe Area Hospital, PA
Current Position: Private Practice, Family Medicine, Latrobe, PA (owns the practice)

Ridwan Lin
MD 03/PhD 01
Advisor: Robert Levenson
Neuroscience
Residency: Neurology, Cleveland Clinic Foundation, OH
Current Position: Fellowship in Vascular Neurology, University of Pittsburgh Medical Center

Akash Patnaik
MD 03/PhD 01
Advisor: John Wills
Cell & Molecular Biology

Residency: Internal Medicine, Mayo Graduate School of Medicine, Rochester, MN
Fellowship (2006) in Hematology/Oncology, Beth Israel Deaconess Medical Center, Harvard, Boston, MA
Current Position: Instructor, Medicine, BID

Carolyn E. Pizoli
MD 03/PhD 01
Advisor: Ellen Hess/Melvin Billingsley
Cell & Molecular Biology
Residency: Pediatrics, St. Louis Children's Hospital, MO
Current Position: Fellowship in Pediatric Neurology, St. Louis Children's Hospital, MO (on a K12 doing neuroimaging research using fMRI to study recovery/plasticity in traumatic brain injury (pediatric))

Joseph J. Rasimas
MD 03/PhD 02
Advisor: Anthony Pegg
Chemical Biology
Residency: Psychiatry, Mayo Graduate School of Medicine, Rochester, MN
Fellowship: Psychiatry, NIH, Bethesda, MD
Previous Position: Associate Professor of Psychiatry, PSHMC, Consultation Psychiatry Services (part-time)
Current Position: Staff Clinician, NIH/NIMH Experimental Therapeutics & Pathophysiology Branch; Associate Professor of Psychiatry & Emergency Medicine, PSCOM; Associate Program Director for the Medical Toxicology fellowship at Pinnacle Health/Penn State

Bethanee J. Schlosser
MD 03/PhD 01
Advisor: Mary K. Howett
Cell & Molecular Biology
Residency: 2003-2004 Dermatology, Mayo School of Medicine, FL (transitional), 2004-2007 Chief Resident, Dermatology, Emory U School of Medicine, GA;
Current Position: Assistant Professor of Dermatology, Northwestern University

Abraham P. Fong
MD 04/PhD 02
Advisor: Shao-Cong Sun
Cell & Molecular Biology
Residency: Stanford University, CA Pediatrics
Fellowship in Pediatrics/Hematology/Oncology in Seattle Children's Hospital, WA
Current Position: Acting Instructor in Pediatrics/Hematology/Oncology, Fred Hutchinson Cancer Research Center, Seattle, WA (does clinical research in pediatric cancer via a K08 award)

Faoud T. Ishmael
MD 04/PhD 01
Advisor: Steve Benkovic/Judith Bond
Chemical Biology
Residency: PSHMC, PA/Internal Medicine
Fellowship: (research), Johns Hopkins University, Allergy & Clinical Immunology
Current Position: Assistant Professor of Medicine; Joint appointment in Biochemistry & Molecular Biology, PSHMC/PSCOM; Member of the MD/PhD Steering Committee

Paul N. Meyer
MD 04/PhD 02
Advisor: Michael Chorney
Cell & Molecular Biology
Residency: Loyola University Medical Center, Maywood, IL/Pathology
Fellowship: Hematopathology, University of Nebraska Medical Center, Department of Pathology & Microbiology, Omaha, NE
Previous Position: Pathologist at Medical Diagnostic Lab, Mount Vernon, WA
Current Position: Academic position (50% res/50% svc) at VA in Tucson, AZ/U of AZ Medical Center

Akiva Mintz
MD 04/PhD 02
Advisor: Waldemar Debinski
Cell & Molecular Biology
Residency: Lehigh Valley Hospital, PA & U of PA/Nuclear Medicine
Fellowship: Department of Radiology, U of PA
Current Position: Wake Forest U Health Sciences, attending Nuclear Medicine physician & Assistant Professor in Radiology in the Dept. of Radiology & Neurosurgery. He directs the brain tumor imaging library.

Kieu X. Luu
MD 05/PhD 03
Advisor: Anthony Pegg
Cell & Molecular Biology
Residency: Duke, NC/Anesthesia
Fellowship: Regional Anesthesia, Duke
Current Position: private practice in Anesthesiology in Richmond, VA

William J. Meehan
MD 05/PhD 03
Advisor: Danny Welch/Kristin Eckert
IBIOS/Molecular Medicine
Residency: U of Mass. Medical School, MA/Psychiatry
Current Position: Physician, Behavioral Health, Harvard/Vanguard, Boston, MA

Oleg Nisenberg
MD 05/PhD 03
Advisor: Anthony Pegg
Cell & Molecular Biology
Residency: U of Loma Linda, CA Internal Medicine
Current Position: Hospitalist in Internal Medicine, Kaiser Panorama City Medical Center, CA

Shane J. Quiterio
MD 05/PhD 03
Advisor: Brian Wigdahl
Cell & Molecular Biology
Residency: Christiana Care, DE/Emergency Medicine
Current Position: Emergency physician at Peninsula Regional's Robert T. Adkins, MD, Emergency/Trauma Center, Salisbury, MD

Michael Waterfield
MD 05/PhD 03
Advisor: Shao-Cong Sun
Cell & Molecular Biology
Residency: Pediatrics, UCSF, CA
Fellowship: Pediatric Rheumatology/Immunology at UCSF
Current Position: Adjunct Instructor of Pediatrics, UCSF School of Medicine

Melissa A. Cunningham
MD 06/PhD 04
Advisor: James Hammond
Cell & Molecular Biology
Residency: Medical U of S. Carolina, Charleston, SC/Internal Medicine
Fellowship: Rheumatology & Immunology, MUSC (lupus)
Current Position: Assistant Professor at Medical U of SC

Robin L. Kilker
MD 06/PhD 04
Advisor: Maricarmen Planas-Silva
Cell & Molecular Biology
Residency: PSHMC/Good Samaritan Hospital, Lebanon, PA/Family Medicine
Current Position: Homemaker

Mandy L. Maneval
MD 06/PhD 04
Advisor: Kristin Eckert
Cell & Molecular Biology
Residency: Williamsport Hospital, Williamsport, PA/Family Medicine
Current Position: Family Practice, Mountain View Medical Center, Mifflintown, PA

Brian Blasiolo
MD 07/PhD 05
Advisor: Robert Levenson
Cell & Molecular Biology
Residency: U of Pittsburgh Medical Center, PA/Anesthesia
Current Position: Fellowship in Pediatrics/Anesthesia, Children's Hospital of Pittsburgh, PA

Stacey L. Clardy
MD 07/PhD 05
Advisor: James Connor
Cell & Molecular Biology
Residency: PSHMC/ Medicine; PSHMC/Neurology
Current Position: Fellowship at Mayo School of Medicine, Rochester, MN as of 7/1/2012

Ryan J. Felling
MD 07/PhD 05
Advisor: Steve Levison
Neuroscience
Residency: Children's Hospital of Philadelphia/Pediatrics; Johns Hopkins, MD/Pediatric Neurology
Current Position: Fellowship in vascular neurology at Johns Hopkins

Subarna Hamid
MD 07/PhD 05
Advisor: Kristin Eckert
Biochemistry & Molecular Biology
Residency: PSHMC/Medicine; Tufts-New England Medical Center/Radiation Oncology
Current Position: Staff physician & Assistant Professor, UPMC Cancer Center, Johnstown
Radiation Oncology facility, PA

Jelena M. Pavlovic
MD 07/PhD 06
Advisor: Joanna Floros
IBIOS/Molecular Medicine
Residency: St. Vincent's Hospital, NY/ Medicine; Albert Einstein COM, NY/Neurology;
Cardiology, U of Toronto
Postdoc: 2014 cardiology U of Toronto
Fellowship: Headache Medicine & Facial Pain at Montefiore Headache Center
Current Position: Assistant Professor of Neurology, Montefiore Medical Center, Albert Einstein
College of Medicine

Mark JK Chandy
MD 08/PhD 06
Advisor: Jerry Workman/James Hopper
Biochemistry & Molecular Biology
Residency: University of British Columbia/Internal Medicine
Current Position: Toronto General Hospital, Sunnybrook Health Sciences Center & St.
Michael's Hospital, Toronto, Ontario, Canada

An ND Do
MD 08/ PhD 06
Advisor: Leonard Jefferson
Molecular Medicine
Residency: Indiana University School of Medicine, IN/Medicine/Pediatrics
Current Position: Fellowship in Genetics & Metabolism at Johns Hopkins/NIH

Jeffrey M. Sundstrom
MD 08/PhD 06
Advisor: David Antonetti
Cell & Molecular Biology
Residency: PSHMC/ Medicine (preliminary); PSHMC/Ophthalmology
Fellowship: Ophthalmology, University of Michigan, Ann Arbor
Current Position: Assistant Professor/Physician Scientist, Penn State Hershey Medical Center,
Penn State College of Medicine (primary appointment in Ophthalmology, secondary
appointment in Neuroscience & Anatomy)

Damian J. Dyckman
MD 09/PhD 06
Advisor: Chester Ray
Physiology
Residency: Naval Medical Center, Portsmouth, VA/Otolaryngology
Current Position: US Navy flight surgeon

Meredith A. Hannan
MD 09/PhD 07
Advisor: Robert Levenson
Genetics
Residency: UCLA/Psychiatry
Fellowship: UCLA Semel Institute for Neuroscience & Human Behavior/Child & Adolescent
Psychiatry (clinical + research)

Aley G. Kalapila
MD 09/PhD 07
Advisor: Anthony Pegg
Cell & Molecular Biology
Residency: University of Washington, Seattle/Internal Medicine,
Fellowship: University of Washington & Affiliated Hospitals, Seattle/Allergy & Infectious Disease

Christina M. Ryan
MD 09/PhD 07
Advisor: Todd Schell
Microbiology & Immunology
Residency: Stanford University Lucile Packard Children's Hospital, CA/Pediatrics
Current Position: Pediatric Hospitalist at Kaiser Permanente Santa Clara, CA

William J. Zinnanti
MD 09/PhD 07
Advisor: Keith Cheng/Robert Milner
Neuroscience
Residency: Brooklyn Hospital Center, Brooklyn, NY/Pediatrics (preliminary);
Fellowship: Stanford University, CA/Pediatric Neurology
Current Position: CEO & President, Zinnanti Surgical Design Group, Santa Cruz, CA

Daniel A. De Cotiis
MD 10/PhD 09
Advisor: John Flanagan
Biochemistry & Molecular Biology
Residency: NYPH Weill-Cornell, NY/General Surgery (preliminary); Temple U Hospital,
PA/Diagnostic Radiology

Jocelyn P. Edathil
MD 10/PhD 08
Advisor: Blake Peterson (UP)
Chemistry
Residency: Temple University Hospital, PA/ Internal Medicine
Current Position: Convent, India

Ryan M. Mitchell
MD 10/PhD 09
Advisor: James Connor
Cell & Molecular Biology
Residency: University of Washington Affiliated Hospitals, Seattle, WA/Otolaryngology

Neggy Rismanchi
MD 10/PhD 07
Co-Advisors: Robert Levenson & Craig Blackstone (NIH)
Neuroscience
Residency: Orange County Children's Hospital, CA/Preliminary, Pediatrics; UCSD/Pediatric
Neurology

Ato O. Wright
MD 10/PhD 08
Advisor: Shao-Cong Sun
Cell & Molecular Biology
Residency: Transitional Preliminary, Mercy Catholic Medical Center, PA, Duke University
Medical Center, NC/Radiation Oncology

Vance L. Albaugh
MD 11/PhD 09
Advisor: Christopher Lynch
Physiology
Residency: Vanderbilt University Medical Center/General Surgery

Violetta Kivovich
MD 11/PhD 09
Advisor: Mark Kester
Cell & Molecular Biology
Residency: New York Presbyterian Hospital-Weill Cornell Medical Center/Pediatrics

Joon H. (Andy) Lee
MD 11/PhD 11
Advisor: Shao-Cong Sun
Cell & Molecular Biology
Residency: University of Chicago Medical Center/General Surgery

Kimberly R. Lumsden
MD 11/PhD 09
Advisor: Diane Thiboutot
Molecular Medicine
Residency: York Hospital/Family Medicine

Bozo Todoric
MD 11/PhD 09
Advisor: James Connor
Cell & Molecular Biology
Residency: Lehigh Valley Hospital (transitional); Duke Eye Center/Ophthalmology

Jay Jin
MD 12/PhD 10
Advisor: Robert Levenson
Cell & Molecular Biology
Residency: Mayo School of Medicine, Rochester, MN/Internal Medicine

Kristin Plichta
MD 12/PhD 10
Advisor: Edward Gunther
Cell & Molecular Biology
Residency: PSHMC/Preliminary Year/Medicine

James Bauer
MD 13/PhD 11
Advisor: Christopher Siedlecki
Bioengineering
Residency: University of Wisconsin/Pathology

Melanie Dispenza
MD 13/PhD 11
Advisor: Diane Thiboutot
Physiology
Residency: Northwestern/Internal Medicine

Kathryn Erickson-Ridout
MD 13/PhD 11
Advisor: Philip Lazarus
Cell & Molecular Biology
Residency: Brown University/Psychiatry

Emilie Muelly
MD 13/PhD 11
Advisor: Scott Bunce
Neuroscience
Residency: UC Davis/Radiology

Carolina Pinzon-Guzman
MD 13/PhD 11
Advisor: Colin Barnstable
Neuroscience
Residency: Vanderbilt/General Surgery

Kathryn Huber-Keener
MD 14/PhD 13
Advisor: Jin Ming Yang
Pharmacology
Residency: University of Iowa/Obstetrics & Gynecology

Olivier Rolin
MD 14/PhD 12
Advisor: Eric Harvill
IBIOS/Immunology & Infectious Disease
Residency: Virginia Commonwealth/Physical Medicine & Rehabilitation

THESIS COMMITTEE MEETING FORM

This form is to be filled out and signed by both the student and committee according to the instructions on the bottom of the form. It is also available on the MD/PhD Google Docs site.

The Pennsylvania State University
College of Medicine
MD/PhD Program
Hershey, PA

Report on the Doctoral Committee Meeting
_____ (MM/DD/YYYY)

Name _____ Degree: Doctor of Philosophy
PSUID _____ Graduate Program: _____

Student Progress:

Evaluation of the student's progress and performance					Signature of each Committee Member (additional notes should be on a separate sheet)	
Superior	Above Average	Average	Below Average	Unacceptable		

An evaluation of "unacceptable" must be accompanied by a written statement by the committee member

Descriptive comments based on discussion by the Doctoral Thesis Committee:

1. Work ethic
2. Engagement
3. Scientific literacy (reading, attending seminars and participating in other learning activities)
4. Verbal communication skills
5. Written communication skills
6. Responsibility for ownership of project
7. Additional comments:

Signature (Student) _____ Date _____

Signature (Thesis Committee Chair) _____ Date _____

Signed Copies to: Student, Committee Chair, Committee Members, Graduate Program Director, Associate Dean for Graduate Studies (Dr. Verderame), MD/PhD Co-Directors, MD/PhD Program Administrator

TRAVEL FUNDS REQUEST FORM

The form below is available on the MD/PhD Google Docs site or by request. It should be filled out by the student and signed by the thesis advisor then emailed to the MD/PhD Program office for approval.

TRAVEL FUNDS REQUEST FORM (\$300) MD/PHD PROGRAM

Student's Name _____

Conference Name _____

Conference Location _____

Purpose of Trip: Oral Presentation ___
Poster Presentation ___
Attendee only ___

Date of Departure _____

Date of Return _____

Student's Signature _____

Date

Advisor's Signature _____

(MD/PhD Office use only)

Approvals:

Leslie Parent _____
Date

Robert Levenson _____
Date

(return signed form to Barbara Koch)