

Updated November 21, 2006



**PHP 593 - Syllabus
INFECTIOUS DISEASES CLINICAL ROTATION
Veterans Affairs Medical Center
University of Rhode Island - College of Pharmacy**

Preceptor: Kerry L. LaPlante, Pharm.D.
Assistant Professor of Pharmacy

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Directions to my office:

When you enter the Veterans Affairs hospital from Chalkstone Avenue, stay to the left side of the road and continue towards the back of the hospital. My office is in Research Building #35. It is a gray building on the left hand side as you drive behind the hospital. You will have to be buzzed into this building (buzzer next to the main door on the right wall).

Before you rotation Begins:

- Completed paperwork given to you by URI for VAMC rotation (months in advance, see Deb Geary).
- Your preceptor will need your full legal name and your SS# for paperwork, please call in or e-mail this information (minimum one week prior)
- Read the entire syllabus prior to starting at the VAMC

First Day of Rotation- 8:30am meet with preceptor in her office (parking is difficult, plan ahead, do not be late!!):

1. Bring the following:
 - Clean and pressed white lab coat
 - URI name tag
 - Calculator with log functions
 - Copy of your resume (CV), driver license (for human resources) and one other form of picture ID for human resources fingerprinting.
2. Review syllabus with preceptor
3. Go to Human Resources (HR) for fingerprinting, ask preceptor what time your appointment is at (HR is the first building across the street from the ER), Obtain from human resources a signed copy of you WOC letter

4. Obtain letter from Research Office for building access (Regina Murphy)
 - o Give Dr. LaPlante a signed copy of your HIPPA Form/ Cyber Security Form
5. Find Library (room 242 down the hall from pharmacy)
6. Take copy of application, Vehicle Registration Information and WOC letter to Security for name badge and parking pass The parking pass and name badge can be obtained at the security office on the first floor of the hospital (Security office hours are limited to 7:30am to 8:30am and 3:30pm to 4:30pm).
7. Sign on for computer access (see instructions below)
8. Set up printer, select Install Printer Icon from your desktop. Select the "RES35-4200" printer. This will allow for your printing jobs to be sent to the printer in the research office area, by the printer and fax machine.
 - Review PubMed tutorial, Up-to-date, Micromedex, CPRS system
9. Remind your preceptor to have Elaine in medicine add you to the gold team and ID consult.
10. Obtain copy of VAMC Antibioqram and Stanford Guide to Antimicrobial therapy.

Computer Sign on (First Time)

Please note, everything is case sensitive!!!

- Go to VA computer. Use assigned Windows Username:
 - o VHAPRO.....
 - o use "Welcome01" as password, you will then be asked to change your password
- Select <Vista> from main window
- Select <DHCP>, hit <enter> 2 times
 - o Enter access code: (i.e., first 3 letters of your last name followed by 3 numbers)
<enter> <enter>
 - o Your VISTA Verify Code is: "welcome01?"
- Create verify code (must be 8 characters with combo if Caps lowercase numbers and punctuation (no periods)) i.e. Pharmacy123??
- Create electronic signature ESIG – choose another pass you will remember - same requirements as last.
- Close out of DHCP

SITE INFORMATION

Hospital and hospital system specific information

The Providence Veterans Affairs Medical Center (VAMC) is dedicated to providing high quality comprehensive outpatient and inpatient healthcare to veterans residing in Rhode Island and southeastern Massachusetts. Each veteran who comes to the Medical Center for care is assured personalized care by a team of health care providers. A Primary Care Provider coordinates each patient's medical care, patient education needs and referrals to any of the medical centers 32 subspecialty clinics. The VAMC is licensed for 119 beds. The VAMC in Providence, RI has professional affiliations with Brown University School of Medicine, The Harvard School of Dental Medicine and The University of Rhode Island.

Pharmacy services (clinical services offered)

The Department of Pharmacy at the VAMC in Providence provides a variety clinical pharmacy services that include a pharmacist-managed Anticoagulation Clinic, Hepatitis C clinic, Adherence clinic, and Secondary Cardiovascular Risk Reduction Clinic. Several consult services are provided in the areas of Pain Management, Inpatient Internal Medicine, Infectious Diseases, and Primary Care.

The VAMC Providence offers residency opportunities for pharmacy graduates. Our broad spectrum of care and specialization prepare students to be leaders in the field.

Infectious Diseases Consult Team

The patient population for this rotation consists of patients followed by the Infectious Diseases (ID) Consult team. Examples of the types of patients include general medicine and intensive care patients. Please note that ID consult team at the Providence, VAMC typically receives 3-5 new consults per week and rounds on Monday, Wednesday and Friday afternoons. In addition to a faculty member from The University of Rhode Island (URI), the team consists of an ID attending, ID fellow, and nurse epidemiologists.

Gold Team

Patricia Cristofaro, MD and Tony Panciera, NP follow all patients admitted to the Gold team. This team typically follows 3 to 6 patients with general medicine problems. Most of the time patients have problems relating to infectious diseases or the potential to develop an infection. This team rounds daily between 9am and 10:30am.

ADVANCED PHARMACY PRACTICE EXPERIENCES MANUAL

It is expected that the student has read and understood the policy's set forth in the University of Rhode Island's, College of Pharmacy, Advanced Pharmacy Practice Experiences Manual. It is suggested that the students review the following sections before beginning this rotation as they will be strictly enforced.

- Professional Conduct and Attire
- Confidentiality of health care information
- Absence Policy
- Health requirements
- Incomplete Rotations
- Cheating and Plagiarism – Zero tolerance

ID ROTATION GOALS

By the end of this 5-week rotation, the student should acquire the basic knowledge of the following:

1. Applied principles of antimicrobial therapy.
2. Understanding of pathogenesis and clinical manifestations of infectious diseases as it relates to the patients covered by the student and ID team.
3. Working knowledge of antimicrobial mechanisms of action and resistance.
4. Culture and susceptibility data interpretation and application to specific patients
5. Clinical management of patients with infectious diseases
6. Pharmacologic, pharmacodynamic and pharmacokinetic properties of antimicrobials used in the treatment of infections.

Please refer to **Appendix A** for assistance in organizing your thought process when working up patients.

SUGGESTED REFERENCES

1. Mandell GL, Douglas RG Jr, Bennett JE, eds. Principles and Practice of Infectious Diseases. 5th Ed. New York: Churchill Livingstone. (VAMC Medical Library room 243 – under references)
2. Dipero J, Talbert, Yee et al. Pharmacotherapy, A Pathophysiological Approach. Fifth edition McGraw Hill.

3. Yu VL, Merigan TC Jr, Barriere SL, eds. Antimicrobial Therapy and Vaccines. 1999. Baltimore, MD: Williams & Wilkins.

STUDENT ACTIVITIES

1. Scheduled time at hospital: The student is expected to be at the rotation site by 8:30am each day. The student is required to remain on site until 5pm or until ID rounds are complete. All time missed from the rotation will be made up and may include additional assignments. *(Please note that most students find that they need more time to appropriately research their topics and write up cases, it is not uncommon to keep longer hours)*
2. Meeting time: The student will meet with the preceptor to review patients that the student is following and to review specifically the therapeutic interventions the student has or will make on the ID team medical rounds. The scheduled daily meeting time will depending upon what time the ID team will be starting rounds.
3. Reliability: All assignments and meetings are scheduled at specific times/dates. The preceptor **must** be notified (pager, or message left on phone) of any alteration from these schedules. The preceptor must approve of the alteration or delay in assignment completion. The student should make sure they completely understand all assignments and responsibilities. It is the student's responsibility to ask questions if they do not understand the assignment or completion date.

ID CONSULT TEAM STUDENT RESPONSIBILITIES

1. Following Patients: The student is assigned to follow all patients currently being seen by the ID team. The student will round with the fellow and ID team and is expected to be present on rounds until completion. The student will receive notifications of new consults on the VAMC's CPRS program. The student shall check for new consults on a daily basis or more often as required to obtain information on new consults.

Students will formally present one new patient case that will be seen on ID consult, plus all follow-ups on previously presented cases and review the isolated patient list (see a, b and c below).

- a. New Consult - Patient presentations: On Mondays, Wednesdays and Fridays the students will formally present to the preceptor one new patient that is being followed on the ID consult team. This patient will also be presented to the members of the ID consult team. Case presentations must be must be presented as see in the section titled **Appendix C- Case Presentation – Example**.
- b. Follow-up patients: A follow-up patient is a patient case that has already been presented and discussed with the preceptor. Follow-up cases are presented daily and will be presented after new cases. The student will present all follow-up information in the following order: Patient name, room, Tmax for last 24 hours, all pertinent labs, current day(s) of antimicrobial therapy, medical and ID team impressions, pharmacy problem list including interventions. Students will also be required to maintain a follow-up sheet with pertinent ID information (**see Appendix B - Patient Monitoring Sheet – Example**). This sheet will be updated on a daily basis, prior to meeting with the preceptor. A photocopy of this list will be given to all members of the ID consult team.

GOLD TEAM STUDENT RESPONSIBILITIES

1. Following Patients: The student is assigned to follow patients currently seen by the Gold team. The patient(s) should have an ID problem or the potential to develop an ID problem. The student will receive notifications of new consults on the VAMC's CPRS program and/or the attending physician or nurse practitioner. The student will round with the Gold team and is expected to be present on rounds until completion.
 - a. On Mondays, Wednesdays and Fridays the students will formally present to the preceptor one new patient that is being followed on the Gold team. This patient will also be presented to the members of the Gold team. In addition, the student will follow-up and report on previously presented cases (see a, b and c below).
 - b. New Consult - Patient presentations: At the preceptor/student meetings, students will present each new patient case as new consults come into the service. Case presentations must be presented as see in the section titled **Appendix C Case Presentation – Example**.
 - c. Follow-up patients: A follow-up patient is a patient case that has already been presented and discussed with the preceptor. Follow-up cases are presented daily and will be presented after new cases. The student will present all follow-up information in the following order: Patient name, room, Tmax for last 24 hours, all pertinent labs, current day(s) of antimicrobial therapy, medical and ID team impressions, pharmacy problem list including interventions. Students will also be required to maintain a follow-up sheet with pertinent ID information (**Appendix B Patient Monitoring Sheet – Example**). This sheet will be updated on a daily basis, prior to meeting with the preceptor. A photocopy of this list will be given to all members of the Gold consult team.

4. Antimicrobial Briefs: The student will give antimicrobial drug presentations on selected agents after recommending therapy. They will be presented to the preceptor at the meetings.
5. Pharmacokinetics: The student will calculate **all** aminoglycoside and vancomycin dosage regimens for all patients seen by the ID team. Estimates and calculations will be discussed during the scheduled meeting with the preceptor.
6. Understanding Guidelines: The student will work closely with antimicrobial monitoring efforts and criteria based antimicrobial system of ID guidelines. The student will be asked to evaluate patients on request to determine if antibiotic use for the patients they are following meets with current prescribing guidelines.
7. Therapeutic Contributions: The student must complete and hand in to the preceptor every Friday a computerized list of all therapeutic contributions made that week during ID rounds. These contributions include those that were accepted and those not accepted. Contributions that increase costs should also be recorded. Use the "Inpatient Intervention Form" from the **Advanced Pharmacy Practice Experiences Manual** for documentation purposes.
8. Journal Club: The student will present one topic dealing with antibiotics at therapeutic journal club. The topic should deal with therapeutic controversies. The ID student will present this topic at the end of the **2nd week** of rotation. **The presentation must include a**

well-referenced (approximately 4 to 6 references), typed, single spaced (minimum 4 page including references) report, that is paginated, and contains one inch margins. The hand-out should be paginated and contain the title of the presentation, journal citations, a summary of the methods, results authors' conclusions, and a very detailed critique section completed by the student. An example journal club write up will be given to you by your preceptor upon request. [Please see APPE student syllabus for grading sheet, you should have received this at the beginning of you rotations.](#)

9. Paper: The student is required to write a paper throughout this rotation. The paper will count for 10% of the student's final grade in this course. An Infectious Diseases topic will be assigned during the first week of rotation. The paper should be a minimum of 4 double-spaced typed pages, paginated, contain one inch margins and should include at least 7 to 10 references. A draft of this paper is due during the **3rd week** of the rotation and the final version is due on the last day of the rotation. There are no exceptions.. The "Grading Form for Writing Activity" from the ***Advanced Pharmacy Practice Experiences Manual*** will be used for evaluation of the paper. [Please see APPE student syllabus for grading sheet, you should have received this at the beginning of you rotations.](#)

Please note: Plagiarism is unacceptable and if identified, even on a draft copy, the grade for the assignment will result in a zero and policy's set forth in the University of Rhode Island's, College of Pharmacy will be strictly enforced.

10. Presentation: The student is required to give one presentation throughout this rotation. The presentation will count for 10% of the student's final grade in this course. An Infectious Diseases topic will be discussed during the second week of rotation draft of this presentation is due during the **4th week** of the rotation and the presentation will be given at during the **5th week** or rotation. There are no exceptions. [Please see APPE student syllabus for grading sheet, you should have received this at the beginning of you rotations.](#)
11. Noon Conference: Various ID topics (i.e., pneumonia, septic shock) are given at the noon conferences during the month. The student may attend these lectures to further their knowledge base regarding infectious diseases and antimicrobials. The student shall check the schedule posted outside the Chief medical residents office room 547.
12. ID Grand Rounds at Brown: The ID Division of Brown Medical School gives various presentations on ID topics during the month. These conferences take place at 8:30am every Wednesday. The preceptor will provide site locations and topics upon student's request. It is highly recommended that the student attend these lectures to further their knowledge base regarding infectious diseases and antimicrobials.
13. Midpoint evaluation: The student will meet with the preceptor at the end of the third week of the clerkship for a midpoint evaluation. [Please see APPE student syllabus for grading sheet, you should have received this at the beginning of you rotations.](#)
14. Competency Exam: During the last week of rotation, the student will be required to take an ID therapeutic exam (25 questions, which include multiple choice, short answers, and definitions). Please study the review sheet to prepare for this examination (**Appendix C**). This exam will not have a numerical factor against the student's final grade. However, competency and comprehension of materials is a requirement in the course and this exam will aid in measuring the student' understanding, knowledge base and skill set.
15. Returning Loaned Materials: The student is required to hand in all materials loaned to him/her by the preceptor during the rotation on the last day of rotation.

STUDENTS WITH DISABILITIES

Any student with a documented disability is welcome to contact the preceptor upon first day of rotation so that we may work out reasonable accommodations to support your success during this rotation. One may also contact Disability Services for Students, Office of Student Life, 330 Memorial Union, 874-2098.

ACADEMIC DISHONESTY STATEMENT

A practicing pharmacist must be able to be trusted to regulate the dispensing of controlled substances and to enforce all laws pertaining to the ethical dispensing of medication. If you feel that cheating in your coursework is the only way for you to pass courses and obtain a pharmacy degree, you have aspired to the wrong profession. Any student caught cheating or plagiarizing will be dealt with according to the University Due Process Statute.

EVALUATION AND GRADING PROCESS

(The following is a direct excerpt taken from URI's "Advanced Pharmacy Practice Experiences" manual pg 14)

"Each student will be evaluated by his or her rotation preceptor using the *Student Performance Assessment Tool*. The four clinical skill areas which are evaluated include professionalism, communication, knowledge base and problem solving. The composite of the clinical skills evaluation will comprise 80% of the clerkship grade. The remaining 20% of the clerkship grade will include an oral presentation worth 10% of the grade and a written project worth 10% of the clerkship grade. The student will be evaluated twice during the rotation: at the midpoint and at the completion of the rotation. The midpoint grade is to identify strengths and weaknesses and attempt to address them in the second half of the rotation. Students must receive a passing grade in each of the four skill areas evaluated for a passing grade on the clerkship rotation. In addition, a minimum grade of a C- is necessary to pass all PHP 593 rotations. Any student not passing in any skill area or not receiving a minimum grade of a C- will be evaluated by the Director of Clerkship for the appropriateness to continue his or her experiential learning. Students may be required to repeat rotations where substandard performance is exhibited and thus may delay their expected date of graduation. Remedial work will need to be completed prior to enrolling in subsequent clinical clerkship experiences. The Director of Clerkship will devise a plan for the student to complete a remedial curriculum".

"Students disputing a clerkship grade should first discuss the grade with the clerkship preceptor. If the dispute is not resolved after discussion with the preceptor, the student should next discuss the grade with the Director of Clerkship. If resolution does not occur at this stage, the student may contact the Department of Pharmacy Practice Chair, followed by the Dean of the College of Pharmacy, if necessary. If resolution does not occur after discussion with the Dean, an ombudsman will be sought to reach a resolution."

Plagiarism

If a student plagiarizes a paper that's written to meet the APPE course requirements they will receive a 'zero' for that paper (factors into the 10% part of their grade). This includes journal clubs and final witted papers. This is non negotiable.

Kathy Fisher will be immediately made aware of any instances of plagiarism.

I have read and discussed with my preceptor the syllabus that includes student responsibilities. I have been given a chance to ask questions and to clarify any of the above assignments or responsibilities. My preceptor has given me a signed copy of these responsibilities.

Student Signature _____

Date _____

Preceptor Signature _____

Date _____

APPENDIX A

Competencies and Tasks

Collecting data. In working up each patient each student is required to collect patient specific data from CPRS. This includes daily microbiology reports, patient chart, and nursing records) to design a pharmacotherapeutic plan. Gather patient specific data such as:

- a. Antimicrobial drug history
- b. Vital signs including Tmax for past 24 h
- c. CBC, serology, specific infection markers (viral load etc.)
- d. Track anti-infective changes, days of therapy
Drug concentrations (aminoglycosides, vancomycin..etc)

Interpret Data.

- a. Gram-stain results of patient specimens
Identify and interpret patients culture and susceptibility
Interpret serology testing results
Assess antibiotic concentrations and determine if dosage adjustment is necessary
Assess patient organ function (renal, hepatic,.etc.) and determine if dosage adjustment is required
Interpret all laboratory data that is relevant to patient's drug therapy

Develop a pharmacotherapy problem list.

- a. Identify an infectious diseases pharmacotherapy problem list specific to each patient followed by the ID Consult Team.

Items to consider:

1. appropriate drug for bug?
2. appropriate dose?
3. antibiotics to add or delete?
4. alternative (less toxic, more potent) ?
5. drug-drug interactions, drug-food interactions?
6. patient's clinical response appropriate?
7. potential for drug resistance?

Design a therapeutic plan for the identified patient-specific problem(s) through the pharmacodynamic, economic, quality of life and ethical/legal considerations (utilizing primary literature where appropriate).

- a. Include drug dose and duration of therapy
- b. Alternative therapies

Implement the pharmacotherapy plan (including appropriate monitoring parameters and their limitations). Action plans should include:

- a. Contact and communication with physician fellow, or resident

Monitor/modify the therapeutic plan. Modify plan as needed to adjust for:

- a. patient improvement
- b. patient failure
- c. appearance or elimination of antimicrobial side effects
- d. changes in organ function
- e. changes in bug-drug profile
- f. changes in care plan (transfer or discharge)

Document outcomes achieved through the implementation of a therapeutic plan.

- a. Document drug therapeutic plan.
- b. Document therapeutic accomplishments.

Interpret, generate, and disseminate knowledge in pharmacotherapy.

- a. Provide drug in-service to ID consult team upon request
- b. Provide antimicrobial drug brief reviews to the team
- c. Counsel patients on antimicrobial therapy

Document and report new, unusual, or severe pharmacotherapeutic events (e.g. adverse reactions, drug interactions, new drug effects, and drug/device/assay defects.)

- a. Report ADEs to preceptor and drug information services ASAP
- b. Document ADEs in chart and on hospital official reporting forms

Disseminate pharmacotherapeutic knowledge to patients, practitioners, health-care team members, and health-care managers in order to foster the safe, effective, economic use of therapeutic agents.

- a. Provide in-services and patient counseling as needed

Appropriately interview a patient.

- a. Obtain a complete drug history
- b. Interview family members as appropriate

Present a patient case in an organized and complete case presentation format as follows:

- a. Patient case (normal order CC, history of present illness, past medical history, social history, family history, allergies, Meds, ROS, physical exam etc.)
- b. Pertinent laboratories, culture results and sensitivities
- c. X-ray, CT results etc.
- d. Hospital course and reason for ID-consult
- e. ID-team findings including recommendations (consult information summary) plus treatment including dosages, the number of days of therapy.
- f. Pathophysiology of disease state. In depth review of infectious disease and drug therapy provided by student (includes documentation from current literature (primary literature preferred))
- g. Therapeutic assessments, plans and recommendations - The student is expected to use current primary literature to prepare for morning presentations with the preceptor. The student will then present his/her therapeutic assessment and plans for this patient including patients that are presented as follow up.
- h. Antimicrobial Briefs: The student will present antimicrobial drug briefs on the selected agent. This will include mechanism of action, place in therapy, mechanisms of resistance, monitoring parameters and interactions (food/drug. drug/drug)

Extract important and relevant information from primary literature and apply it to the care of individual patients.

Demonstrate a sense of responsibility for the drug therapy outcomes of the patients being followed.

- a. Student will promptly follow-up on all drug therapy related issues to ensure therapeutic efficacy and safety for the patients he/she is following.

Displays a professional demeanor in dealing with patients and other health care professionals.

Problem List Suggestions

You must develop a problem list plan for each patient presented. The following are questions you should commonly ask yourself regarding the patient's antimicrobial therapy.

1. Is the organism sensitive to the present antibiotic(s)?
2. Is the patient receiving the correct dosage/regimen for the organism and or disease state?
3. Are there any other antibiotics to add for synergy etc?
4. Are there overlapping antibiotics (can we reduce the antibiotic prescribed)?
5. Are there less toxic, more efficacious or less expensive alternatives?
6. Is the patient responding to the antimicrobials? (Clinical evidence, definitive evidence?, i.e., culture negative etc.)?
7. Are there any drug-drug interactions present?
8. Is the patient tolerating the antimicrobial regimen?
9. Are there non-antibiotics contributing to the patient's toxicity?
10. Is there an appropriate oral alternative?
11. Is the original organism now resistant to therapy?
12. Does the present antibiotic therapy meet the hospital's criteria monitored drug program?
13. Do we need to obtain antibiotic serum concentrations to verify obtainment of the therapeutic range or can we reduce the number of routine serum concentrations being drawn?

APPENDIX B
Example - Infectious Disease Consult Team - Patient List
Veterans Affairs Medical Center
Tuesday, November 21, 2006

| Name/Locati on (Last 4 SS#) | Admit Date | Notes (allergies, tests x-rays) | Infection (documented or RO) | Antibiotics | DOT | Tmax/WBC 24h |
|--|--------------------------------|--|--|---|--|---|
| <p>Smith(1234) ICU-627A</p> <p>78M</p> <p>Allergies AMP (1/93) hx SULFA (2/03) hx</p> <p>CrCl: 50ml/min Wt 63.2 kg IBW: 56.9</p> | <p>3/18/05</p> | <p>CC: Worsening SOB</p> <p>PMHx: COPD, HTN, DM</p> <p>HPI severe COPD now trached and vented, failure to ween, course complicated by VAP</p> <p>ID Consult (3/28) intubated for copd exacerbation, currently on vanco for mrsa bronchitis, s/p course of cefepime and azithro for h. flu in sputum; head ct with sinusitis. Allergy to ampicillin and sulfa. Request help for coverage of sinusitis (cipro flagyl started empirically for bowel infx but ct abd neg for abscess so can d/c)</p> <p>LABS: 5/6: Sputum 3+ PMN, 4+ MRSA (F) 5/2: VRE + 5/2: MRSA + 4/28: Sputum >100PMN,11-15 Epi MRSA</p> | <p>UTI + yeast Para Sinusitis Empirically for bowel infx Empirically for bowel infx VAP –MRSA CAP – H flu</p> | <p>Discharge planning to Cedar Crest</p> <p>Previous Ab's Fluconazole 400mg iv q24 Gatifloxacin 400mg Ciprofloxacin 400mg iv q12 (4/30-5/7) Metronidazole 500mg q8h (4/13-4/27) Vancomycin 1g q24h (4/23-5/3) Azithromycin 500mg IV q (3/18-3/21) Pipricillin (3/22- 3/28) Tazo added on 25th Cefepime 2g q24 (3/19-3/22)</p> | <p>7 7 15 11 4 7 4</p> | <p>Tmax: (5/6) WBC 9.1</p> <p>P: BP</p> |
| <p>No Official Consult Jones (5678) ICU-S632A</p> <p>82 F</p> <p>Allergies: NKA Ht: 64in Wt. 96.36kg IBW: 54.2</p> <p>CrCl: 40 (1.1)</p> | <p>3/9/05 Nursing Home</p> | <p>CC : Surgical removal and flap on 5.0cm x 2.0 cm thickness on left cheek.</p> <p>HPI: Squamous cell cancer, left buccal mucosa, surgery scheduled for myocutaneous flap.</p> <p>PE: Nursing notes (5/11) SKIN: Coccyx stage 3 ulcer stage with collagenase Left heal 2.5 cm in diameter necrotic tissue, open to air and waffle boot GU: pt voiding via foley catheter IV ACCESS: I subclavian tl. intact Suctioned for thick Yellow sputum lungs dim on left and right base coarse right upper. Episode of vomiting this am (5/10)</p> | <p>LABS: 5/11: SPUTUM: Pend. 5/11: BLOOD: Pend. 5/11: NASAL: Pend. 5/11: URINE: Pend. 5/2: Urine, E coli >100,000 5/2: VRE + 5/2: MRSA –</p> <p>CXRay: hest film in upright position shows increased opacities involving both lung fields and haziness at the bases which may be related to pleural effusion</p> | <p>Possible sites of infection:</p> <ol style="list-style-type: none"> Surgical site lt. cheek – bacitracin applied to left cheek as ordered, triamcinolone cream Stage 3 decub – nursing changing and applying topical mupirocin VAP – cx pending UTI - foley catheter, >100,000 <i>E.coli</i> Cath infection - I subclavian | | <p>Tmax: 96.6-98.3°F</p> <p>WBC: 22.2, SEGS 86, Bands, 2</p> <p>Glu:115-142 P:66-79 BP:95/42 Vent: PSV, difficulty weaning from vent</p> |

APPENDIX C
EXAMPLE - Formal Patient Presentation
(Infectious Diseases Pharmacy Consult)

B1234

Date: April 5, 2005

ID Consult: March 29, 2005

Author: K. LaPlante

Chief Complaint. Pt called VA stating that "he had a cold and was feeling SOB"

History of Present Illness. Pt is a 78 y/o male with h/o COPD, causing him multiple hospitalizations and no previous intubations. He presents to the ER on 3/18 from home with respiratory distress, eventually having difficulty communicating. Per pt's family, he caught a cold with productive cough and congestion from his wife 2 days ago and was treated with a Z-pak. During admission in ER, pts condition did not improve after IV furosemide 80 mg, solumedrol IV 125 mg, and nebulizers were administered. Pt was intubated with minor complications, O2 sats stayed above 95%. Pt was afebrile.

Past Medical History.

1. COPD (FEV1% 0.71 in 2002)
2. Type 2 DM (1999)
3. GERD
4. Hypomagnesemia

Past Medical/Surgical History.

1. Hernia repair (1998)
2. Rt Colectomy - partial removal of colon (1995)

Active Outpatient Medications.

1. Accu-Chek Comfort (Glucose) Test Strip
2. Albuterol 90mcg 200d Oral Inhl Inhale 4 Puffs Inhalation Every Six Hours As Needed
3. Albuterol SO4 0.083% Inhl 3ml Inhale 3mls By Mouth Three Times A Day
4. Alcohol Prep Pad Use Pad(s) Topically Twice A Day
5. Artificial Tears Polyvinyl Alcohol Instill 2 Drops In Left Eye At Bedtime
6. Azithromycin 250mg Tab Take One Tablet By Mouth Every Day For Infection
7. Diltiazem Hcl 90mg Tab Take One Tablet By Mouth Three Times A Day
8. Fluticasone 500/Salmeterol 50 Inhl Disk 60 Inhale 1 Puff By Mouth Twice A Day For Breathing - Rinse Mouth After Use
9. Fluticasone Prop 50mcg 120d Nasal Inhl Instill 1 Spray Each Nostril Once Or Twice A Day
10. Fosinopril Na 10mg Tab Take One-Half Tablet By Mouth Every Day
11. Furosemide 40mg Tab Take One Tablet By Mouth Every Day
12. Guaifenesin 600mg Sa Tab Take One Tablet By Mouth Three Times A Day
13. Insulin Human NPH 100u/MI Inj Inject 10 Units Under. The Skin Twice A Day For Diabetes
14. Insulin Syringe 1ml 29g 0.5in Use Syringe For Insulin Active Injection Twice A Day As Needed
15. Ipratropium Bromide 0.02% Inh Soln 2.5ml Inhale 1 Ampule By Mouth Four Times A Day
16. Ipratropium Bromide 18mcg 200d Oral Inhl Inhale 4 Puffs By Mouth Four Times A Day
17. Isosorbide Dinitrate 10mg Oral Tab Take One Tablet Three Times A Da
18. Lancet (Techlite) 25g Use Lancet For Finger Stick Test Four Times A Day To Test Blood Sugar
19. Loratadine 10mg Tab Take One Tablet By Mouth Every Day
20. Magnesium Oxide 420mg Tab Take One Tablet By Mouth Twice A day
21. Nitroglycerin 0.4mg SI Tab Btl 25 Dissolve One Active Tablet Under The Tongue As Directed As Needed For Chest Pain May Repeat Every 5 Minutes 3 Times If No Relief Call 911
22. Omeprazole 20mg Sa Cap Take One Capsule By Mouth Every Morning One-Half Hour Before Breakfast For Stomach Acid

23. Prednisone 5mg Tab Take One Tablet By Mouth as Directed
24. Terazosin Hcl 5mg Cap Take One Capsule By Mouth At Bedtime
25. Travoprost 0.004% Oph Soln Instill 1 Drop In Both Eyes At Bedtime

Allergies.

1. Ampicillin (rash, historical in 1993)
2. Ranitidine (unknown, historical in 1993)
3. Contrast Reaction (nausea, vomiting, SOB, dizziness in 1994)
4. Sulfamethoxazole (unknown, historical in 1993)

Family History. Lives at home with wife and daughter. Wife with cold at same time of patient

Social History. Quit tobacco x30 yrs, quit EtOH x12 yrs.

Physical Examination.

Vital Signs: T: 97.7 P: 91 BP: 106/52
Height: 63 in
Weight: 145 lb (65.9 kg)
IBW: 56.9kg
Intubated: O2: 98% PRVC FiO2 40%, PEEP 5, TV 500, R: 20

Review of Systems.

Non contributory except for: GENERAL: sedated on propofol
CHEST: b/l exp wheeze, very tight air movement, no crackles

Labs: CrCl: ~38ml/min
WBC: 10.1K/cmm
Plt: 162 K/cmm
Lymph: 3.9 L
Mono: 6.5%
Gran: 88.8%
pH: 7.23 L
HCO3: 27.1H
Glu: 193 H
BUN 37 H
CREAT 1.3H

Radiology. CXR: Right lower lobe consolidation and/or atelectasis. Possible left lower lobe air-space opacity
also. COPD and significant interstitial changes.

Brief Admitting Summary. 78 y/o with h/o COPD and Type 2 DM presents with COPD exacerbation likely triggered by upper respiratory infection. Pt required intubation from continued respiratory distress and intolerance of bipap.

Impression in ER. COPD exacerbation, rule out PNA.

Plan (ID only). Questionable RML infiltrate on CXR.

- Started on Azithromycin 500 mg IV qd, Ceftriaxone 1 gm IV qd.
- Pt allergic to Ampicillin (facial rash), so no Zosyn started.

Hospital Course (3/18 through 3/28). Admitted to MICU, intubated no complications. On HD #2, WBC were 10.1 and pt was afebrile. Ceftriaxone was changed to Cefepime given pt Hx of Pseudomonas PNA

(March 2004). On HD#3, pt then started having low grade fevers to 101, no increase in WBC's, cultures sent. Sputum Cx from admission grew H. Flu (Amp susceptible, beta-lactamase negative). Cont'd on Azithro and Cefepime. Fevers cont'd, no inc in WBC, sputum repeated on 3/22 which grew MRSA (>100 PMN's, 6-10 epis and 1+ MRSA). Pt with poor MS, had Head CT 3/24 negative except some sinusitis per report (not on official reading). Central line changed, tip Cx negative. On 3/25 (HD#8), azithromycin and cefepime d/c'd after seven day course and vancomycin started for possible MRSA bronchitis (CXR remained negative). On 3/26 (HD#9), WBC increased to approx 17K. Given abdominal distention, Abd CT done revealing likely ileus but no abscess. Also had LP given continuing low grade fevers and poor MS, results negative. Cipro/flagyl was added to vancomycin empirically for intra-abd coverage. All blood cxs negative. Over last 24 hours, fevers improved and pt more awake. Some ATN with transient creatinine rise-now better.

ID Consult on 3/28: 78 yo man intubated for COPD exacerbation, currently on vancomycin for MRSA bronchitis, s/p course of cefepime and azithro for h. flu in sputum; on head ct with sinusitis. Allerg to ampicillin and sulfa. Request help for coverage of sinusitis (cipro flagyl started empirically for bowel infx but ct abd neg for abscess so can d/c).

REVIEW OF COMMUNITY-ACQUIRED PNEUMONIA.

Definition. Pneumonia is an infection of the lung parenchyma.

Introduction. Community-acquired pneumonia (CAP) is one of the most common causes for adults seeking medical attention. In the United States, pneumonia is the sixth most common cause of death; and it is estimated that it causes approximately 500,000 to 1 million hospitalizations per year.

Microbiology. CAP can be caused by bacterial or viral pathogens. Management is also difficult because it is difficult to identify the causative organisms. The most common (also referred to as typical) causes of community acquired pneumonia in North America are caused by *Streptococcus pneumoniae* (20-60%) and *Hemophilus influenza* (3-10%). Additionally pathogens such as *Mycoplasma pneumoniae*, influenza A, *Legionella* species, *Chlamydophila pneumoniae*, *Moraxella catarrhalis*, *Mycobacterium tuberculosis*, and aspiration pneumonia are considered atypicals. Nursing home patients often present with community-acquired pathogens. However, there is an increased likelihood that *S. aureus* (in the setting of aspiration or following influenza) or gram-negatives are likely pathogens.

Clinical Presentation. The diagnosis of specific pathogens that cause pneumonia can be very challenging as the clinical symptoms commonly overlap. In general, typical bacterial pathogens such as *S pneumoniae*, *H influenzae*, usually present acutely with high fever, chills, rapid breathing, tachycardia, and productive cough. Examination findings are localized to a specific lung zone and may include rales, rhonchi, bronchial breath sounds. This presentation is in contrast to atypical pathogens such as *Mycoplasma*, *Chlamydophila*, and viruses that can present with fever, nonproductive cough, and absent or diffuse findings on lung examination. Rapid progression of disease to respiratory failure can be seen in severe pneumococcal or *Legionella* pneumonia.

Treatment: The initial site of treatment should be based on a 3-step process:

1. Assessment of preexisting conditions that compromise safety of home care.
2. Calculation of the pneumonia PORT (Pneumonia Outcome Research Team) Severity Index with recommendation for home care for risk classes I, II, and III
3. Clinical judgment

Empiric regimens — The Infectious Disease Society of America (IDSA) have put together guidelines for the treatment of CAP. These guidelines breakdown patients into specific treatment categories based on inpatient or outpatient settings and those managed in a general medical ward or in the ICU.

(Refer and discuss **Table 1** from the 2003 IDSA guidelines: *Initial empiric therapy for suspected bacterial community-acquired pneumonia (CAP) in immunocompetent adults.*)

Duration of therapy. The duration of therapy for CAP has not been thoroughly studied. Most patients respond to a 10 to 14 day course of antibiotics. Duration of therapy is based upon patient's clinical signs and symptoms and overall clinical response.

Response to therapy. With appropriate antibiotic therapy, some improvement in the patient's clinical course should be seen within 48 to 72 hours. Fever in patients with lobar pneumonia often takes 72 hours or longer to improve.

ANTIMICROBIAL DRUG BRIEF

Drug Name: Azithromycin

Mechanism of Action. Azithromycin inhibits protein synthesis in bacterial cells by binding to the 50 S subunit of bacterial ribosomes.

Pharmacokinetics: Azithromycin is administered both orally and intravenously. Following oral administration, absorption of azithromycin is rapid. Food increases the mean serum concentration (C_{max}) of azithromycin tablets and suspension by about 23% and 56%, respectively; however, the AUC remains unchanged. This antibiotic possesses excellent tissue penetration, especially in the lungs. Distribution of azithromycin throughout the body is extensive and azithromycin exhibits significant intracellular penetration. As a result, tissue levels are significantly higher than are plasma concentrations. CNS penetration, however, is poor. Azithromycin has a long half-life (68 hours), which is partially explained by its extensive tissue uptake and slow release. The drug is not metabolized, and elimination is largely in the feces, following excretion into the bile, with less than 10% excreted in the urine

Common drug-drug interactions. Antacids (binding), digoxin and warfarin

Common Side Effects. Azithromycin is generally well tolerated. The most common side effects are diarrhea or loose stools, nausea, and vomiting. These side effects are uncommon but may occur in fewer than 1 in 20 persons who receive azithromycin. Rarer side effects include abnormal liver tests, allergic reactions, and nervousness.

Counseling points. Per the manufacturer, both azithromycin tablets and the oral suspension may be taken with or without food.

Monitor. LFTs

Infectious Diseases Pharmacy Consult Recommendation

S/O: Pt. is a 78 y/o male who presented to the ER from home on 3/18 and was intubated and admitted to the MICU for respiratory distress. He has a PMHx of COPD, Type 2 DM, and Hx pseudomonal PNA (March of 2004). Pt is currently being treated with ciprofloxacin and metronidazole for a possible bowel infection and vancomycin for a possible MRSA bronchitis, sinusitis or right hand/wrist cellulitis. Cefepime 1g q12h was empirically added for possible nosocomial sinusitis. Pt is allergic to ampicillin and sulfamethaxazole, per history. Pt is 63 inches tall, weighs 62.5kg, (IBW is 56.9kg), serum BUN is 44, serum Cr is 0.6, WBC, 8.6, Tmax, 96.4, estimated CrCl is 49ml/min. Blood cx, NGTD, 1+ MRSA in sputum from 3/22.

A/P: Per pts primary resident, CT for abd abscess is neg so ciprofloxacin and metronidazole. Continue to cover for MRSA bronchitis and possible cellulitis. According to the 2004 ATS guidelines for the treatment of nosocomial pneumonia, targeted troughs should range between 15-20mcg/ml. Dosing of vancomycin IV 1g q12 in this patient are estimated to achieve a trough of 15 mcg/ml. Monitor BUN and serum creatinine every two days, if serum creatinine is stable obtain vancomycin trough every 5 days. If serum creatinine is unstable, monitor vancomycin troughs every two days, check for signs of phlebitis daily. Continue to monitor temperature, wbc, and maintain tight glucose control.

APPENDIX D
ID Pharmacotherapy Review Sheet for Clerkship Final Exam

- 1. Review definitions for the following pharmacodynamic/kinetic properties:**
 - a. MIC
 - b. MBC
 - c. Inoculum effect
 - d. Post antibiotic effect - PAE
 - e. Concentration-dependent and independent killing
 - f. Bacteriostatic verses bactericidal antibiotics

- 2. Review common mechanisms of resistance (15):**
 - a. Beta-lactamase including:
 - i. TEM and SHV
 - b. Target site and enzymatic (other than beta-lactamase) modification
 - i. Penicillin Binding Protein etc
 - ii. Aminoglycoside modifying enzymes etc.
 - iii. MLS resistance (inducible and constitutive)
 - iv. VRE
 - c. Porin changes
 - d. Efflux

- 3. Review commonly resistant organisms (15):**
 - a. MRSA/GISA/VRSA
 - b. VRE
 - c. ESBLs

- 4. Review treatment plans and be familiar with Infectious Diseases Society of America (IDSA) and national guidelines (IDSA.org):**
 - a. Fever/Neutropenia (9)
 - b. Community-acquired pneumonia (7, 11)
 - c. Nosocomial pneumonia (2)
 - d. Diarrhea, Infectious (8)
 - e. Cellulitis, Skin and Soft Tissue Infections (16)
 - i. Diabetic Foot infection (10)
 - f. Meningitis (17)
 - i. S/S patients may have or complain about
 - ii. Labs - Interpret a CSF (opening pressure – what is it, glucose, protein, WBC?)
 - iii. Microbiology - most common organisms
 - iv. Treatment
 - g. Urinary tract infections
 - i. Asymptomatic Bacteriuria (12)
 - ii. Cystitis in women (15)
 1. What are the S/S patients may have or complain about
 2. Labs - Interpret a urine culture (how to collect, amount of CFU/ml, seen, S/S, nitrite test leukocytes.
 3. Microbiology - most common organisms
 4. Treatment
 - h. Osteomyelitis
 - i. Tuberculosis (1, 13)
 - j. Endocarditis (6)
 - k. Candidiasis (14)
 - l. HIV related opportunistic infections (3, 5)

- i. PCP
- ii. MAC
- iii. CMV
- iv. Cryptococcus
- m. Sepsis
- n. Catheter Infections
- o. MRSA/GISA

5. Review common antibiotic drug interactions and major side effect profiles for (4):

- | | |
|---------------------|-------------------------------|
| 1. Anti-fungal's | 6. Lipopeptides - Daptomycin |
| 2. Aminoglycosides | 7. Macrolides |
| 3. Beta-lactams | 8. Oxazolidinones - Linezolid |
| 4. Carbapenems | 9. Glycopeptides - Vancomycin |
| 5. Fluoroquinolones | |

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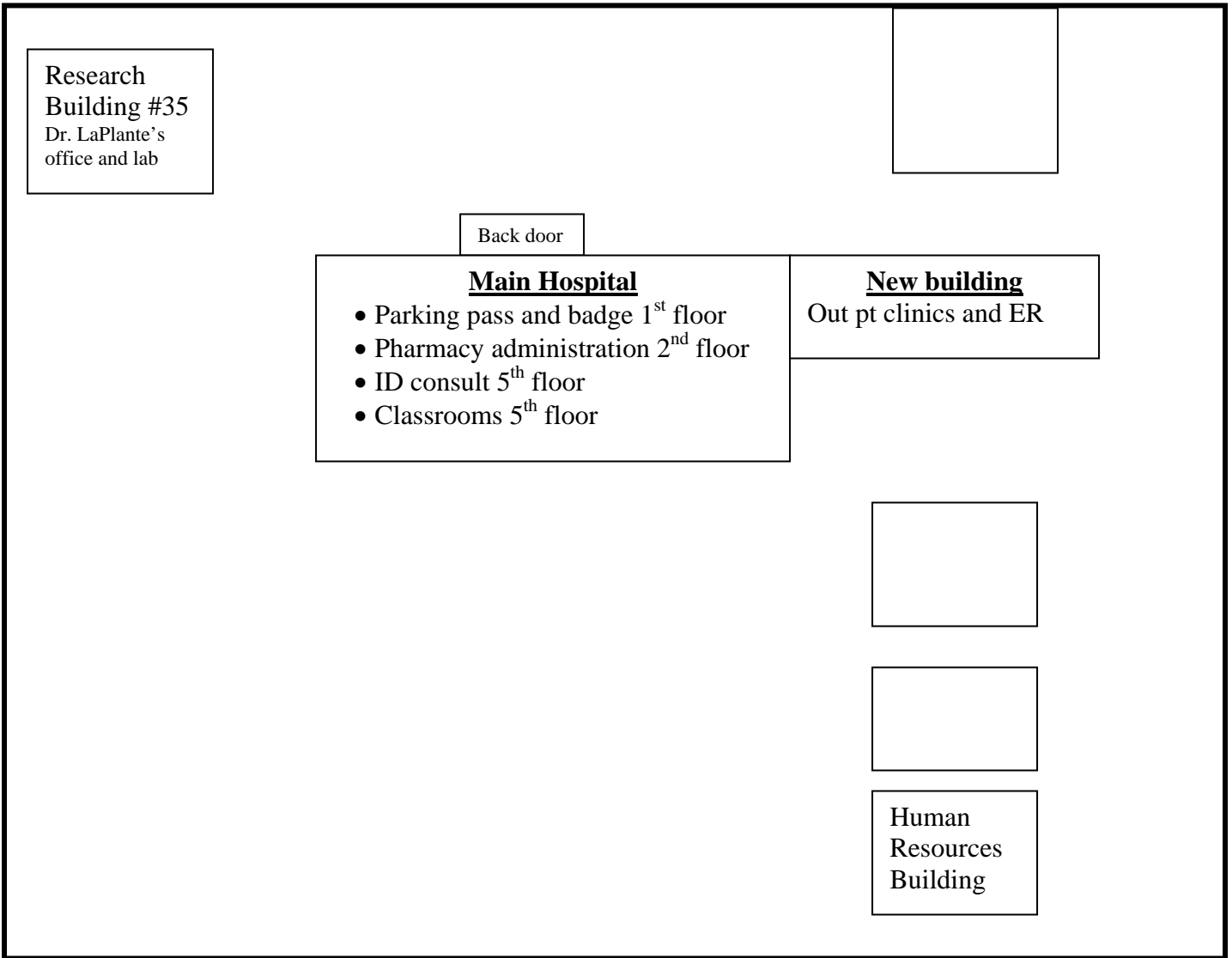
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