VOLUME 4, ISSUE 2
November 2018

NYS-ACCP Insider

Long Island University
Arnold & Marie Schwartz College of Pharmacy and Health Sciences

Special Points of Interest:

2018 Mock Interview

Long Island University-ACCP Student Chapter Synopsis

The Long Island University (LIU) American College of Clinical Pharmacy (ACCP) student chapter was founded in 2002, and since then, it has grown into an organization that helps guide students towards a career in clinical pharmacy. The mission of the LIU-ACCP is to better prepare pharmacy students through a series of activities to develop excellent clinical skills both inside and outside the classroom. With the help of chapter advisors, Dr. Roda Plakogianis (since 2002), and Dr. Yoonsun Mo (since 2017), the LIU-ACCP student chapter has achieved its mission by promoting events for its members that would give insight and information around clinical rotations, interviews, and various research opportunities. These events include community outreach initiatives, journal and guideline clubs, and professional development programs (PDP) that educate students about residency programs and research and provide opportunities to develop clinical skills. In addition, the LIU-ACCP has continually engaged the student members to be actively involved in the pharmacy community.

2018 Professional Development Program with PGY2 Resident Dr. Lau

2018 Leadership Dinner

For the academic year 2017-2018, the LIU-ACCP hosted a series of events with topics that included clinical research, community outreach, and professionalism. There were instructional presentations, such as the one given in September 2017 by Dr. Yoonsun Mo, in which students learned about clinical research and were advised on opportunities for poster presentations during showcases and conferences. The LIU-ACCP student chapter also endorsed a community outreach program, such as the event in September 2017 where the chapter held a bake sale to build funds for the Juvenile Diabetes Research Foundation (JDRF) walk for type 1 diabetes. Additionally, there were presentations that helped prepare students in their professional development. In October 2017, ACCP collaborated with American Pharmacy Association (APhA) and The Pharmacy Newsletter (TPN) to host a PDP by Dr. Jane Shtaynberg who provided guidance around how to build an effective resume and curriculum vitae (CV). To follow up with this concept, in November 2017, ACCP collaborated with APhA and Rho Chi Society to host a PDP by Dr. Bhupendra Shah, in which he outlined the key points and common mistakes to avoid in an interview. The chapter also held a guideline club in November 2017, in which they reviewed the 2017 American Diabetes Association (ADA) standards of medical care in diabetes.

September 2018 Guideline Club

October 2018 Journal Club

For the academic year 2018-2019, our chapter is looking forward to hosting several guideline/journal clubs, drug information sessions, and education sessions for pharmacy residency programs. Our first guideline club, in September 2018, covered the 2017 ACC/AHA hypertension (HTN) management guidelines where we highlighted the changes in the HTN management. Through this discussion, we had a better approach and understanding regarding the different hypertensive categories, goals and treatments. The second guideline club regarding the role of non-statin therapies in the management of hyperlipidemia will be discussed in the near future. Additionally, in October 2018, the chapter held its first journal club for the year, which focused on intravenous levetiracetam versus phenytoin for status epilepticus. This event was helpful for first year students to understand how to critically evaluate the literature and for third year students to refresh concepts that will be used for their upcoming APPE rotations. The LIU-ACCP will also offer many opportunities for students to explore pharmacy residency programs. This year, our chapter has the honor of hosting a residency mock interview with clinical pharmacists and a discussion panel with several New York State residency directors. This discussion panel, which will take place in March 2019, will be represented by residency directors from NYU (New York University) Langone Health, Mount Sinai Queens, Brooklyn Hospital, and Lenox Hill Hospital, and it will be a great opportunity for students considering a career in clinical pharmacy to network and get feedback and answers for inquiries about pharmacy residency programs. There will also be a professional development program about clinical research and residency career options.

2018 NYS-ACCP Annual Meeting (Cooperstown, NY)

The LIU-ACCP student chapter has significantly grown not just in size but in its offerings as well. This is a collective effort by everyone involved and deserves special consideration to particular members. Our chapter would like to thank our faculty advisors Drs. Plakogiannis and Mo for their remarkable support and guidance. We would also like to thank our e-board, whose outstanding effort and teamwork has put together a comprehensive agenda. Lastly, we would like to thank our club members for their participation and support for activities organized. We look forward to the coming school year and continued success with the LIU-ACCP.

Crystal Toribio Pharm.D. Candidate, LIU-AMSCOP Class of 2020
Santhy Santiago, Pharm.D. Candidate, LIU-AMSCOP Class 2020
Reviewed by Yoonsun Mo, Pharm.D.

New Drug Review: Plazomicin (Zemdri®)

Plazomicin (Zemdri®) is an aminoglycoside derivative that was approved by the Food and Drug Administration (FDA) in June 2018 for the treatment of complicated urinary tract infections (cUTI).[1] Plazomicin is used for the treatment of cUTI including pyelonephritis that is caused by *Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis, and Enterobacter cloacae species.*[1,2] Plazomicin also has coverage against carbapenem-resistant Enterobacteriaceae (CRE).[3]

Plazomicin has a bactericidal mechanism and works on aerobic gram-negative bacteria by binding irreversibly to the 30s ribosomal subunit and interrupting the process of the protein synthesis.[1] Plazomicin (Zemdri®; Achaogen, CA, USA) is available in an injectable form. The vials of Zemdri® come in a strength of 500 mg/10 mL (50mg/mL) and are to be stored in refrigerated temperatures of 2°C to 8°C (36°F to 46°F).[3] The recommended dose for the treatment of cUTI is 15mg/kg every 24 hours over 30 minutes.[1,2] Dose adjustments are required in patients with renal impairment as it is primarily excreted by the kidney (~90%).[3] It is recommended to administer 10 mg/kg every 24 hours if CrCl > 30 to 60 mL/minute and 10 mg/kg every 48 hours if creatinine clearance (CrCl)> 15 to 30 mL/minute. The half-life of plazomicin is approximately 3 to 4 hours and its affinity for protein binding is roughly 20%.

Plazomicin is contraindicated for patients with hypersensitivity to any aminoglycosides. It has a similar side effect profile to the other aminoglycosides, such as nephrotoxicity, ototoxicity, and neuromuscular blockade.[3]

Before initiating plazomicin, it is recommended to check the baseline CrCl, and patients' renal function should be monitored during the entire course of plazomicin, especially in patients taking concurrent nephrotoxic medications, the elderly population, and patients with renal impairment.[1]
Plazomicin-induced ototoxicity is generally irreversible and has been observed in patients with genetic hearing loss, patients exhibiting renal impairment, patients given higher doses of plazomicin, or patients using plazomicin for extended periods.[3] Neuromuscular blockade has also occurred in patients receiving plazomicin. Neuromuscular blockade can be exacerbated in patients with underlying neuromuscular disorders, myasthenia gravis, or patients who are administered concurrent neuromuscular blocking agents.[1,3] Other adverse effects of plazomicin include diarrhea, hypertension, headache, nausea, vomiting, and hypotension.[4] Similar to other aminoglycosides, plazomicin can cause fetal harm when administered t VOLUME 4, ISSUE 2

The approval of plazomicin was based on the EPIC study; a phase 3, randomized, multicenter, multinational, double-blind, noninferiority study completed in September 2016. The EPIC trial compared plazomicin to meropenem for the treatment of cUTI including acute pyelonephritis (AP).[1] A total of 609 patients were included to compare plazomicin 15 mg/kg intravenously (IV) once daily and meropenem 1 g intravenously every 8 hours followed by optional levofloxacin oral therapy. The rates of microbiological eradiation, clinical cure, and compositie cure (combined microbiological eradication and clinical cure) were evaluated in the microbiological modified intent-to-treat (mMITT) population.[1] Composite cure rates in both groups at Day 5 were similar (88% plazomicin group vs. 91.4% meropenem group; 95% CI, -10 to 3.1). However, composite cure rates of the plazomicin group at the Test of Cure (TOC) visit were significantly higher compared to the meropenem group (81.7% vs. 70.1%; 95% CI, 2.7 to 20.3).[1] Overall adverse events in both groups were similar, which were mild in severity.

The CARE study, a phase 3, multicenter, open-label, pathogen-specific study, was conducted to evaluate the efficay and safety of plazomicin compared to colistin in patients with bloodstream infections (BSI) caused by CRE.[6] The CARE study was presented at IDWeek 2017 in San Diego, (VOLUME 4, ISSUE 2 t to be published. The key inclusion criteria for the study were following: age 18 to 85 years old; documented or suspected infection due to CRE; index culture taken ≤96 hours prior to randomization; Acute Physiology and Chronic Health Evaluation II (APACHE II) score: randomized cohort (15 to 30) and observational cohort (≤30). The key exclusion criteria were >72 hours of prior active antibacterial therapy, randomized cohort: co-infection with non-*Enterobacteriaceae* gram-negative pathogens, and known colistin resistance based on local laboratory testing.

The primary outcome of this study was all-cause mortality (ACM) or significant disease-related complications (SDRCs) in patients with confirmed CRE who received ≥1 dose of plazomicin at day 28. Significant disease-related complications included persistence of CRE bacteremia ≥5 days from initiation of the study drug, new/worsening acute respiratory distress syndrome, new lung abscess or empyema, and/or new-onset septic shock within 7 days of enrollment. The secondary outcome was adverse events. The study subjects were divided into the randomized cohort and observational cohort groups. Within the randomized cohort, the treatment options were plazomicin 15 mg/kg q24h as a 30-minute infusion and a loading dose of 300 mg colistin followed by 5 mg/kg/day divided q8h or q12h as a 60-minute infusion. The observational cohort only consisted of the study drug, plazomicin.

In the randomized cohort study from figure 1, plazomicin-based therapy was associated with lower ACM at day 28 or SDRCs, and lower ACM alone, when compared with colistin-based therapy. Based on figure 2, all patients who developed an SDRC but survived to day 28 (plazomicin, n=1; colistin, n=2) had persistent CRE bacteremia on day ≥5. There was a greater percentage of patients who demonstrated clearance of CRE bacteremia with plazomicin (n=12) compared to colistin (n=7) by day 5. In the observational cohort study, a total of 9 patients treated with plazomicin-based therapy had clearance of bacteremia by day 5. Addionally, three of the four patients with SDRCs survived to day 28, and in each case the SDRC was persistent CRE bacteremia on day ≥5.

Figure 1. Mortality-Based Outcomes

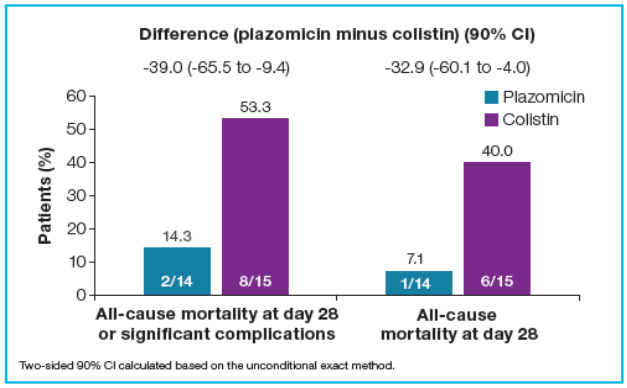
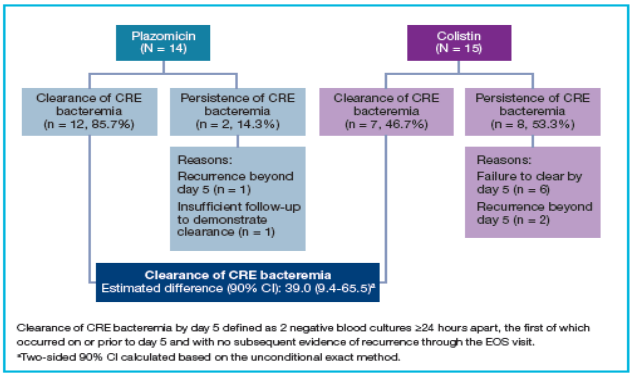


Figure 2. Clearance of CRE Bacteremia by Day 5



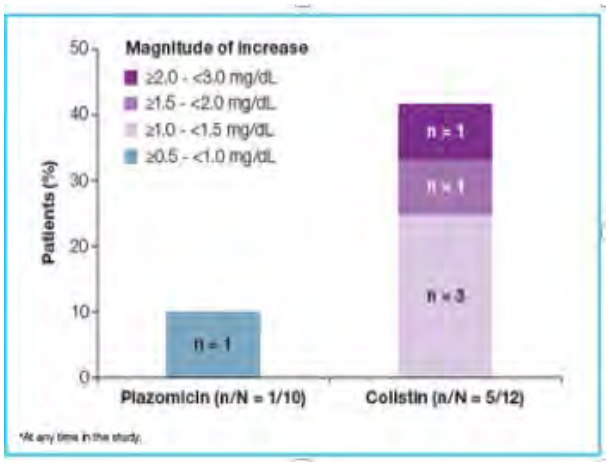
Drug-related adverse events (AEs), serious AEs, and magnitude of serum creatinine elevations were observed in plazomicin-based and colistin-based therapies (Figure 3). In terms of drug-related AEs, patients on plazomicin-based therapy (n=4, 28.6%) had a lower incidence com VOLUME 4, ISSUE 2 olistin-based therapy (n=7, 43.8%). In serious AEs, plazomicin-based therapy (n=1, 7.1%) also had a lower incidence compared to colistin-based therapy (n=4, 25%). Colistin-based therapy demonstrated a higher incidence of post-baseline serum creatinine elevations compared to plazomicin-based therapy (Figure 4).

Figure 3. Safety Summary

Event (Safety Population)	Randomized Cohort		Observational Cohort
	Plazomicin N = 14	Colistin N = 16	Plazomicin N = 15
Any AE	12 (85.7)	16 (100)	14 (93.3)
AE related to study drug	4 (28.6)	7 (43.8)	5 (33.3)
Any SAE	6 (42.9)	12 (75.0)	10 (66.7)
SAE related to study drug	1 (7.1)	4 (25.0)	0
AE leading to discontinuation of study drug	0	0	0
Postbaseline serum creatinine changes[a]			
≥0.5 mg/dL increase any time on study	1/10 (10.0)	5/12 (41.7)	6/12 (50.0)
≥0.5 mg/dL increase on study drug	1/10 (10.0)	3/12 (25.0)	4/12 (33.3)
Full recovery or improvement[b]	1/1	2/3	2/4

[a]Baseline serum creatinine defined as the last central laboratory measurement prior to the first dose of study drug. Patients starting CRRT prior to baseline were excluded from the analysis, as were all postbaseline serum creatinine measurements collected after start of CRRT.
[b]Full recovery was defined as a serum creatinine value within 0.5 mg/dL above the baseline value; improvement was defined as a serum creatinine value ≥0.3 mg/dL less than the peak serum creatinine value but not <0.5 mg/dL above the baseline value.

Figure 4. Postbaseline Serum Creatinine Increase



The CARE study provided supporting evidence that plazomicin-based therapy is a potential treatment for patients with CRE BSI, who have limited or no alternative antimicrobial treatments available since CRE has been reported to be resistant to novel β-lactams as well as last-line agents.

Plazomicin is a new therapeutic option for cUTI that is engineered to overcome aminoglycoside-modifying enzymes, the most common aminoglycoside-resistance mechanism in *Enterobacteriaceae*, and has in vitro activity against ESBL (Extended Spectrum Beta-Lactamase)-producing, aminoglycoside-resistant, and carbapenem-resistant isolates.[3]

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Highlights from the 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/ APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

High blood pressure (BP) is often termed as "the silent killer," presenting with minimal symptoms if any, and posing significant risk for developing cardiovascular conditions such as a myocardial infarction and cerebral vascular disease. In 2010, hypertension (HTN) was the leading cause of death worldwide, and the most commonly encountered modifiable risk factor for cardiovascular related deaths in the United States[1]. Damage to blood vessels occurs soon after hypertension starts. Therefore, detecting and controlling BP early is therefore of utmost importance to prevent cardiovascular complications.

Figure 1: Reprinted from Keller Family Medical Center, 2017

Up until recently, clinicians relied on the "2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report from the Panel Members Appointed to the Eighth Joint National Committee" (JNC 8) guideline for the treatment of hypertension[3]. Since then, new studies were released, most notably the SPRINT trial[4] increasing the need for updated recommendations. The SPRINT t stricter BP control with a systolic BP goal of less than 120 mmHg was more beneficial in high-risk patients than the previous systolic BP goal of less than 140 mmHg in reducing cardiovascular complications. In 2017, the American Heart Association (AHA), American College of Cardiology (ACC) and other health professional organizations released a revised guideline[1]. The new recommendations define hypertension as a BP reading of 130/80 mmHg or higher, which is a stricter definition than that of the previous JNC 8 guidelines. The previous guidelines defined hypertension as anything higher than 140/90 mmHg in patients less 60 years of age and anything higher than 150/90 mmHg in patients older than 60 years of age. Apart from providing new classifications, the 2017 ACC/AHA guideline also provides new treatment thresholds of when to initiate lifestyle modifications and antihypertensive agents.

Table 1. The 2017 ACC/AHA Classifications of Blood Pressure

Blood Pressure (BP) Classification	Systolic BP (mmHg)	Diastolic BP (mmHg)
Normal BP	< 120	< 80
Elevated BP	120-129	<80
Stage 1 Hypertension	130-139	80-89
Stage 2 Hypertension	≥ 140	≥ 90

For patients with normal blood pressure, the recommendation is to encourage healthy lifestyle habits and to reassess their blood pressure in one year. The current HTN guidelines eliminate "prehypertension" as a classification and replace the term with "elevated" for any reading that falls in the BP range of 120-129/80 mmHg. For elevated BP, the algorithm advocates the patient to implement non-pharmacologic treatment methods and to reassess their BP in 3-6 months.

Patients with stage 1 HTN will also need to implement non-pharmacologic therapy, however, not everyone will need to be initiated on antihypertensive agents. The need for initiating drug therapy will depend on the patient's clinical ASCVD or estimated 10-year CVD risk, whereby if the ASCVD risk score is ≥10%, initiation of antihypertensive medication is recommended with a one-month follow-up. In patients with an ASCVD risk score of <10%, only non-pharmacologic therapy is recommended with a 3-6-month follow-up. Patients with cardiovascular disease, diabetes, or CKD are at a higher risk of developing an ASCVD event in 10 years and should be given antihypertensive medications as adjunct to non-pharmacological therapy.

Patients with stage 2 HTN will require initiation of antihypertensive medications, specifically two medications from two different classes and will need to be reassessed in one month. If their BP goal is not achieved, treatment needs to be assessed and possibly intensified.

Apart from the emphasis on cardiovascular disease risk assessment and the introduction of a new algorithm to stage hypertension, the guideline also points out the importance of ensuring accurate BP measurements. Methods that provide more accurate blood pressure readings include selecting the right cuff size, not taking blood pressure measurements over clothes, sitting quietly for 5 minutes before measurements, and taking 2-3 measurements on 2 or 3 separate occasions, with the average BP utilized for diagnosis of HTN. The guideline also highlights the importance of having patients monitor their BP at home and identify those with white coat HTN or masked HTN and treat accordingly.

The first line pharmacologic agents do not differ from the last guidelines, outlining the preferred classes of antihypertensive medications being, angiotensin converting enzyme inhibitors (ACEIs), angiotensin II receptor blockers (ARBs), calcium channel blockers (CCBs), and thiazide diuretics. These agents have demonstrated a reduction in clinical events and should be considered as first-line options. Many other classes of drugs are available such as beta-blockers and loop diuretics, however, those are considered secondary agents and should be reserved for patients with specific cardiovascular comorbidities or if the primary agents are contraindicated or not tolerated. Most patients will ultimately require more than one antihypertensive agent to achieve BP goal. Equally important is the significance of lifestyle changes with diet and exercise along with or without antihypertensive.

Although more adults will be diagnosed with hypertension, not everyone will require antihypertensive medications right away, but everyone, regardless of cardiovascular comorbidities, should attain a BP goal of less than 130/80 mmHg. The new guideline emphasizes the importance in reducing the risk of morbidity and mortality that is associated with sustained BP elevation by identifying and treating hypertension early to prevent further damage to the body.

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Clinical Spotlight: Susan Villegas, Pharm.D., BCPPS

Clinical Pharmacy Manager for Pediatrics at The Children's Hospital at Montefiore and Assistant Professor of Pharmacy Practice at Arnold & Marie Schwartz College of Pharmacy and Health Sciences.

1) What made you interested in clinical pharmacy? Was there anything specific that drew you to this career path?

When I was in high school, I volunteered at a pharmacy and was gravitated to it. In pharmacy school, my class was actually the last to have the option of pursing either a Bachelor of Science degree or a Doctor of Pharmacy (Pharm.D.) degree. I wanted to do residency because of my first APPE (Advanced Pharmacy Practice Experience) experience, therefore I chose to pursue my Pharm.D. degree. I went to West Virginia University and my very first APPE was a month in the pediatric intensive care unit (ICU). I loved it. I liked the hospital setting, I liked attending and participating in rounds and that is what drew me in. I did ICU because I liked the intensity of it and at that time appreciated talking to patients less.

2) What is the most rewarding aspect of your role as a clinical pharmacy manager for Pediatrics at The Children's Hospital at Montefiore?

Adults are in a hospital because they did something to themselves: they smoked for 20 years, or they ate or drank excessively. They did something to themselves that led to complications of their lung diseases, hypertension, emphysema, etc. Whereas a pediatric patient hasn't done anything to themselves. Most of the time it is a congenital defect, an infection, something they were born with, or complications to something that was out of their control. Adolescents become a different story, but for the most part, pediatric patients haven't done anything to themselves to end up in a hospital. I went into that role because I liked taking care of them. They are sort of helpless and got into that situation due to things beyond their control. The most rewarding part is seeing them improve, get better, leave the ICU, and live a healthy life.

3) How do you see your role as a clinical pharmacist evolving over upcoming years?

In New York, the practice of pharmacy is behind the times. I went to school in West Virginia, did a residency in Minnesota, and practiced for number of years in Dallas, Texas. The practice of pharmacy in Texas is much more proactive, demanding, and rewarding because physicians see pharmacists in a different light. The technicians have many more responsibilities and can take on a bigger role, allowing pharmacists to attend more medical rounds and get out of the pharmacy. I'd like to see pharmacists valued more, see more pharmacists in the Emergency Department, and more pharmacists on the floor rounding with the medical team. In NY, even if you complete a PGY1 residency, you may not obtain a position after residency that allows you to achieve the goals you have set forth for yourself. That is how I hope to see the role of a pharmacist evolving over upcoming years.

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5) Have there been any obstacles during your pharmacy career? If so, how did you overcome them?

The pharmacy school I was applying to was an in-state tuition driven school. I was an out of state student applying to a program that only accepted 4 out of state students. When I first applied, I did not get in. I did a year of sports medicine, as well as other anatomy related classes. I applied again and got in. I was one of 4 out of 86 students. That was my first obstacle and it taught to me to just be resilient. When I was practicing in Dallas, I actually didn't have many obstacles. Physicians appreciated us and actually fought for us to be on more services. More challenges were when I came back to NY, where pharmacists have : they are valuable members of the medical team. You can overcome these by educating other practitioners around you about the role of a pharmacist and hoping that roles of clinical pharmacists broaden over upcoming years.

6) When you were a pharmacy student at West Virginia University, did you have mentors whom you looked up to? If so, how did he/she influence you?

I met a lot of professors, had many mentors, and had different connections with all of them. I had one professor, Dr. Jacknowitz, who was from Brooklyn that I gravitated to. I wore a Brooklyn Dodgers jersey to class one day and he, being from Brooklyn, inquired about it, and we made an instant connection. When I was a student, he assisted me in obtaining an APPE at a pharmaceutical company back home. When I got back into academia as a professor, we reconnected and now he is a mentor to me as faculty. Being a Long Island University graduate when the college was known as the Brooklyn College of Pharmacy, he comes here to visit and gives speeches. The faculty member who taught pediatrics and I did a general pediatrics APPE with was a mentor as well. When I was in pharmacy school, she helped me with preparing for the ASHP Mid-Year Conference and since she was in the practice I wanted to pursue, she helped me with residency application process. She helped guide me into what I needed for applying for a residency. Overall, I had a lot of mentors who helped me in different facets of my pharmacy career.

7) What advice would you give a student interested in pursuing a career in clinical pharmacy?

My biggest advice would be to explore different options. If you have never worked in a hospital, make your first APPE rotation in a hospital. Go to different organizational meetings, go to professional development programs (PDP) and hear from different people who have different career paths. If you have different interests, talk to different faculty members who are focused on those interests. Learn what avenues Pharmacy can take you. PDPs are key!

Nawang Lodoe, Pharm.D. Candidate, LIU-AMSCOP Class of 2020
Reviewed by Yoonsun Mo, Pharm.D.

Clinical Spotlight: Dr. Jerry Altshuler, Pharm. D., BCPS, BCCCP

Dr. Jerry Altshuler is a clinical pharmacist at Mount Sinai Hospital, Critical Care Pharmacy Coordinator and Director of PGY2 – Critical Care Pharmacy Residency Program. Dr. Jerry Altshuler is a graduate of The University of Buffalo, and completed his PGY1 residency at NYU Langone Medical Center, and his PGY2 residency at Memorial Hermann Hospital.

1) What are your main roles and responsibilities as a Clinical Pharmacist?

My main responsibilities are optimizing patient care from a pharmacotherapy perspective (ensuring we are using the correct medication(s), at the most optimized dose(s), developing policies and protocols and enhancing education of pharmacy residents, medical and nursing staff. I round in a 14-bed medical intensive care unit every morning for approximately 4 hours and I work collaboratively with physicians to implement the most effective pharmacotherapy plans for our patients.

2) What made you want to pursue a specialty in Critical Care?

I was drawn to critical care early in pharmacy school initially due to excellent experiential experiences in the area. Additionally, appealing facets of critical care include its broad spectrum of diseases and drugs, and challenging clinical cases.

3) What advice would you give to a student looking to pursue a residency program?

Ensure you make the most of your experiential rotations, attempt to attain the most challenging ones and can discuss them at your interviews.

4) What is the goal you have for yourself in the future?

Master of critical care medicine (via the Society of Critical Care Medicine)

5) What research are you currently working on or have recently completed?

Currently I am working on a few areas including the effects on heart rate of converting norepinephrine to phenylephrine in atrial fibrillation with rapid ventricular response in hemodynamically unstable patients and the effects of a global transition from fentanyl to hydromorphone for ICU analgesia/sedation.

Joseph Furer, Pharm.D. Candidate, LIU-AMSCOP Class of 2021
Reviewed by Roda Plakogiannis, BS, Pharm.D., BCPS, CLS, FNLA

Political Action for New York State Pharmacy Interns: Right to Immunize

Immunization remains one of the most crucial health advantages in our modern medical history. It serves as a way for individuals to render themselves resistant to specific ailments that affect one's body. While pharmacists have been distributing small pox vaccines since the 1800's, on November 1st 1996, pharmacists started immunizing patients. Just recently, The New York State Executive Office passed a bill into law allowing pharmacists to immunize children 2 years of age and older. To date, pharmacists can immunize, but the law in New York State is still not permanent and is continuously being debated by the state.

As pharmacy interns living in New York, we along with our classmates are enthusiastic to practice what we have learned in pharmacy school, under the supervision of a licensed pharmacist. One task is the ability to immunize.

We feel that allowing pharmacy interns to immunize is a great opportunity to apply our learned skills to serve our communities and at the same time alleviate the intense workload for the pharmacist. This piece of legislation may serve as a defining positive change for interns to become even more involved in the field of pharmaceutical care.

The right for pharmacy interns to immunize has been a focus in legislation since 2017 among the New York State Assembly and the State Senate. It was observed first by the Pharmacist Society of the State of New York (PSSNY). In New York State, the Assembly Bill A3857 was introduced, was in committee, on the floor calendar, and finally passed through the State Assembly and Senate without any opposition. The New York State Health System's Pharmacists supported the legislation authorizing pharmacy interns to administer vaccines to adults. Per Professor Joseph Bova, it is imperative that the governor is educated on this critical piece of legislation and appreciate the service pharmacy interns, through immunization, may provide to their respective communities. This piece of legislation would inevitably bolster the well-being of communities, improve pharmacy metrics, and provide more efficient work flow for pharmacists.

However, there are misconceptions from patients. Some patients feel that a pharmacy intern is not adequately trained to immunize. Pharmacy interns undergo the same training as pharmacists. Like pharmacists, interns are required to be certified through special classes provided by the New York State Education Department and obtain certification in Basic Life Support and Cardiopulmonary Resuscitation through the American Red Cross. Professor Bova, of the Pharmaceutical Sciences and Director of Continuing Professional Education and External Programs states that LIU pharmacy interns must fulfill an immunization requirement before they graduate, preparing them even more for immunization in practice. Professor Bova also states that if pharmacy interns are granted the right to immunize, there will be an "OPT OUT" form, giving patients the right to choose to be immunized by a pharmacist.

The rules are issued from the Commissioners of Health. They determine the limitations, rules and regulations that the pharmacy interns will have once they are permitted to immunize on behalf of the pharmacist. Further Professor Bova eluded that if the bill does become a law, he would continue to teach the program with an emphasis on pediatric dosing. He states that with their different pharmacokinetics, physiology, difference in dosing and administration needles, prudence is needed for the licensee.

As pharmacy interns, we apply what we have learned from our didactic courses into practice, in preparation for becoming pharmacists. It is crucial for pharmacy interns to be proactive in pharmacy issues and legislation. We encourage our pharmacists and pharmacy interns to go to Albany, urging Governor Cuomo for his pharmacy advocacy, and the right for interns to immunize. Therefore, pharmacy interns may practice at the highest level of their intern license.

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