RHO PX CHI POST

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A student-operated newsletter by the St. John's University College of Pharmacy and Health Sciences Beta Delta chapter

SINGLE-LINE STORIES

- NYS Part III pharmacy licensing examination scheduled for June 5 and 6
- NAPLEX examination seats in New York quickly fill as the number of graduates increase
- Diploma pick-up for 2012 graduates (except Physician Assistants) moved to June 25
- Most ASHP-accredited residencies to begin July 2

FIVE LESSONS LEARNED FROM BEING AN ASSISTANT DEAN

BY: LAURA GIANNI AUGUSTO, BS, PHARMD, ASSOCIATE CLINICAL PROFESSOR, DEPARTMENT OF CLINICAL PHARMACY PRACTICE

Laura Gianni Augusto, Pharm.D., R.Ph. is an Associate Clinical Professor in the Department of Clinical Pharmacy Practice at St. John's University College of Pharmacy and Health Sciences. She served as Assistant Dean for Experiential Pharmacy Education from 2007 to 2011. Her specialty area is Drug Information Practice, and she is now developing a Clinical Pharmacy Informatics elective rotation at Winthrop University Hospital in Mineola, New York.

During my time as Assistant Dean for Experiential Pharmacy Education, I was fortunate to work on a daily basis for and with the leaders of our College of Pharmacy and Health Sciences. The experience certainly showed me firsthand how much responsibility and hard work our leaders assume on a daily basis.

As I am on the threshold to begin a new chapter of my career, I was asked by a Rho Chi student to write about my experiences as an Assistant Dean. This request has made me stop and reflect on all that I have experienced while in this position. Where should I begin? After some thought, I decided to share with you five important lessons that are not necessarily specific to being an Assistant Dean, but applicable to any busy professional trying to make a difference in the institution for which he or she works. These lessons would also be useful to students as they seek to meet the challenges of a demanding Doctor of Pharmacy program.

Lesson One:

Monitor and adjust the balance between your professional career and your personal life

Striking a balance between your career and your personal life is a dynamic process that needs to be reevaluated from time to time. You may hear parents, even your own, say "complete your homework first, play later." This is an important lesson as you are growing up when your life may be relatively "less complex." However, you may find yourself realizing very quickly that once you graduate from college, this lesson no longer applies. You can never say all of your work is complete when you have a profes-

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sional career. Hence, if you wait until your work is completed and all your goals are accomplished, you will never achieve any of the goals for your personal life. When I became an Assistant Dean, my professional career/personal life integration was put to the test immediately. As an Assistant Dean, you quickly realize how many people are affected by your daily decisions and actions (or lack thereof), and you can easily lose yourself in the many important, pressing challenges that need feasible, effective solutions. This, combined with solving daily, unexpected challenges as they occur, can be overwhelming. You have to set your professional and personal priorities, as well as boundaries between work and home, in order to continue being successful at both work and home. Failing to set boundaries will likely result in burnout and subsequently lower your productivity. Ultimately, this helps neither your personal life not your workplace/institution!

Lesson Two

Never lose sight of your professional goals and responsibilities

When you are in an Assistant Dean position, to ensure the success of your institution, it is important to set your vision and goals of what you need to accomplish both short- and long-term. You are constantly assessing the strengths and weakness of where you are now, as well as initiating change that will put your institution on the right path (probably the part of my administrative responsibilities that I enjoyed most). It can be very easy to be swept away by other projects that come up. You should agree to take on additional work or projects if they line up with the goals you need to accomplish for your institution. It may seem harmless to volunteer your time to help accomplish an unrelated project here or there, but when you are very busy, this can be very costly. It can derail your efforts to stay on course to accomplish everything that you want to accomplish, especially to fulfill all the responsibilities for which you were hired. You have to learn to politely say "no" to work that derails your efforts. The success of your institution depends on it!

Lesson Three

Delegate

Depending on the position you hold, you must carefully separate out work that should be reserved for you and work that others could accomplish. Some administrators serve a mostly supervisory role, and they are not as involved in the day-to-day work that could be delegated to support personnel. If you feel that you need more support, it is important to make that need known. You could do so through written documentation that provides statistical data justifying the need for additional help. Delegation also involves training others so that they fully understand their responsibilities. It also involves monitoring their progress to make sure everyone is moving towards a common vision and goals. The ability to delegate does not come natural to every individual, but it is vital in order to help your institution move forward in a timely fashion.

Lesson Four

Protect and manage your time

As an administrator or any busy employee, you must protect your time as much as possible. It is very easy to become distracted from your work with numerous, daily interruptions. It is important to set aside time for scheduled appointments to avoid the distractions of walk-in visitors. You need to set yourself up in such a way to increase your likelihood of having a block of quiet time to complete your work.

Also, you have to learn to manage deadlines. If you do not have a deadline and it is not up for you to decide, you should always ask for a deadline so that you have an idea of the expectations. As it is highly likely that you will have many deadlines to meet at any given time, you need to schedule time in your calendar to work on each project. Try your best to avoid deviating from your schedule so you can move all your projects along little by little each day.

Lesson Five

Always present solutions along with the problems

Problem solving begins with careful listening and observing. This allows you to outline the details of the problem. Subsequently, you need to identify questions that you need answered to fully understand the problem and investigate potential solutions. You should do your own research to figure out the answers and, if needed, identify the individuals who you should consult with to gather more information. Once you have adequately defined your problem and have planned potential solutions, you are now ready to present the problem and potential solutions to your supervisor. An effective employee or administrator should always strive to present identified problems in a detailed manner, right along with detailed recommendations of potential solutions to these problems.

PRESCRIPTION TO OVER THE COUNTER MEDICATIONS

BY: MARIA A. SORBERA, PHARM.D. CANDIDATE C/O 2013

Maria Sorbera was the 2011-2012 President of the Rho Chi Beta Theta Chapter at the Arnold & Marie Schwartz College of Pharmacy at Long Island University (LIU). She is a strong advocate of networking with fellow pharmacists regardless of their area of expertise, as well as the need for more unity in our profession. Ms. Sorbera would like to work with the Beta Delta chapter to promote interprofessional cooperation and further foster unity. The Rho Chi student editors would like to thank Maria for her contributions, and for being a strong, progressive voice in our profession.

"I will apply my knowledge, experience, and skills to the best of my ability to assure optimal outcomes for my patients." As part of the code of ethics within the Oath of a Pharmacist, this statement is made annually by both third year pharmacy students during their "White Coat Ceremonies" and sixth years who graduate with Doctor of Pharmacy degrees. The promise and duty of a pharmacist is to provide optimal patient care to achieve pharmacological and non-pharmacological goals, while minimizing drug interactions and adverse side effects. Since pharmacists are the last healthcare professionals who patients speak with before receiving their medications, these goals are achievable. Through patient counseling and profile reviews, pharmacists play key roles in preventing adverse drug reactions. Where would we be if we had no such prospective drug utilization reviews from pharmacists? Could patients really medicate themselves for chronic medical conditions without the counseling provided by pharmacists?

"Where would we be if we had no prospective drug utilization reviews from pharmacists?"

Recently, I came across an article in *Pharmacy Times* discussing movements by the Food and Drug Administration (FDA) to switch many prescription medications for chronic disease states such as hyperlipidemia, hypertension, and asthma to over-the-counter (OTC).[1] As I read this article, not one positive outcome crossed my mind. How could present and future pharmacists provide optimal healthcare to patients if they are no longer dispensing and counseling on medications for these chronic disease states? One point of discussion is how and when the patients know to begin taking these medications. The article mentioned the idea of kiosks in pharmacies, in which patients answer a series of questions to receive a diagnosis. The problem is that not every patient who walks into a pharmacy is a text-book case; thus hard-coded guidelines would only aid a percentage of the population. It takes evidence-based medicine and a clinician's experience to diagnose patients properly.

Furthermore, many of these medications have serious adverse effects that healthcare providers

need to discuss with patients before they begin their treatments. For example, if a woman of childbearing age receives an HMG-CoA reductase inhibitor (also known as a "statin"), she must be aware that it is a teratogenic category X drug (not for use in pregnancy, as the fetal risks clearly outweigh any benefit of taking the medication). If statins were to become OTC medications, patients must also be aware of the risk of myopathy and the blood monitoring required to avoid this side effect. If more patients begin taking this class of medications without proper counseling, there may be an increased incidence of myopathies.

"How could present and future pharmacists provide optimal healthcare to patients if they are no longer dispensing and counseling on medications for these chronic disease states?"

For antihypertensive medications, there are also several monitoring parameters patients must hear about. Hypertension is a silent killer, and vital signs with laboratory data are necessary. There is a risk of hypotension with all medications used to treat hypertension, and this side effect is prevalent specifically with the elderly population.

Like hyperlipidemia and hypertension, asthma is a chronic disease state that should not be self-treated. If a patient is filling their albuterol rescue inhaler too often, the pharmacist could intervene, speak to the patient, and contact the physician about the possibility of the patient's condition not improving or actually worsening. If that patient is able to purchase inhalers OTC without ever speaking to a pharmacist, such a beneficial intervention would never be made and the patient may remain on a suboptimal asthma regimen.

Although I have only listed a few examples regarding these three chronic disease states, there are several more reasons as to why these should remain prescription-only medications. These reasons, as well as the overall risks versus benefits of prescription-to-OTC regulation changes, have been a topic of discussion by the FDA and regulatory agencies around the world. In 2004, the United Kingdom (UK) was the first country to approve statins for OTC use. The National Health Service, supported by the Department of Health and the Committee of Safety Medicines in the UK, believed that the benefits outweighed the possible risks of statin OTC use.[2] The decrease in the risk of cardiovascular events with only a modest decrease in LDL was the overall benefit that gave this argument the push that it needed for approval. Nonetheless, the FDA is still debating this topic.

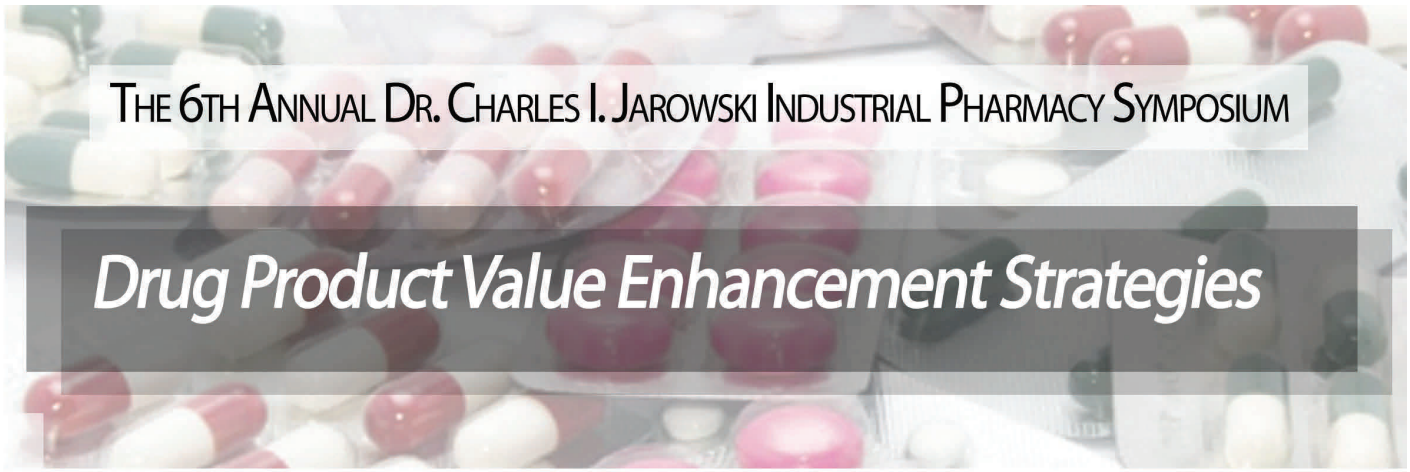
As present and future healthcare professionals, we should strive to provide optimal patient care. Members of the healthcare team should work together to manage patients' acute and chronic disease states, as well as select individualized treatment regimens. In the end, our efforts will lead to comprehensive health care management and innumerable benefits for our patients.

SOURCES:

1. Weiss D. FDA plans next round of Rx-to-OTC switches. Website. Available online: http://www.pharmacytimes.com/web-exclusives/FDA-Plans-Next-Round-of-Rx-to-OTC-Switches. Mar 20, 2012. Accessed Apr 20, 2012.
2. Abrams J. Over-the-counter statins: a new controversy. *Nat Clin Pract Cardiovasc Med*. 2005 Apr;2(4):174-5.

Should certain prescription medications become available as OTC drugs?

Email us at rhochis@gmail.com
and we will feature your response in our next issue!



The 6th Annual Dr. Charles I. Jarowski Industrial Pharmacy Symposium

Drug Product Value Enhancement Strategies

Date: Thursday, June 21, 2012

Time: 8:00 a.m.– 5:30 p.m.

Location:
D'Angelo Center, Ballroom
St. John's University Queens Campus
8000 Utopia Parkway
Queens, NY 11439

The Dr. Charles I. Jarowski Industrial Pharmacy Symposium was created to act as a dynamic forum for the exchange of information and exlopration of current industry trends among distinguished research scientists and our world class alumni, while offering the opportunity for professional development and networking among students, alumni and industry representatives.

The speakers include:

David R. Taft, Ph.D. (Professor and Dean, Arnold & Marie Schwartz College of Pharmacy and Health Sciences, Long Island University),
Kenneth V. Phelps (President and CEO, Camargo Pharmaceutical Services),
Mahendra G. Shah, Ph.D. (Partner, Vivo Ventures, and Former Chairman and CEO, Nextwave Pharmaceuticals),
Sesha Neervannan, PhD (Vice President, Pharmaceutical Development, Allergan)
Salah U. Ahmed, Ph.D. (President and CEO, Abon Pharmaceuticals)
Gary Liversidge, Ph.D. (Chief Technology Officer and Vice President, Alkermes, Inc.),
J. D. Pipkin, Ph.D. (Sr. Director, New Product Development, Ligand Pharmaceuticals)
Tapan Sanghvi, Ph.D. (Scientific Fellow, Vertex Pharmaceutical)

CHALLENGES IN PEDIATRIC DRUG TRIALS AND PRODUCT LABELING

BY: SHANNON TELLIER, ASSOCIATE STUDENT EDITOR

The disease burden in children outweighs the number of pediatric clinical drug trials currently being conducted. The lack of data in pediatrics leads to drugs being used off-label and without sufficient knowledge of doses, tolerability, and efficacy. In 1975, only 22% of products in the electronic Physicians' Desk Reference had pediatric labeling, which increased to 46% in 2009.[1] Even though there has been an increase in the last three decades, the large number of medications without pediatric labeling could lead to detrimental effects in children. This deficiency in pediatric clinical drug trials is due to many factors: lack of financing, as well as legal and ethical problems.

Since most of the currently available medications do not include pediatric labeling, healthcare professionals face difficult decisions. The two options include (1) not treating children with potentially beneficial medications or (2) extrapolating doses of medications from adult trials. The former raises an ethical question and the latter is dangerous because the pharmacokinetic, pharmacodynamic, and toxic properties of drugs in children are quite different from adults. These extensive differences could lead to dosing errors and adverse events in the pediatric population.

Even though the information gained from pediatric clinical drug trials is extremely valuable, conducting these trials is difficult. Finding parents willing to enroll their child in a trial is one of the biggest hurdles. Many parents are hesitant because of the fear of hurting their children by subjecting them to treatment that may not provide immediate benefit. The idea of their child receiving a placebo also turns parents off. It becomes easier to recruit children in trials studying potentially lethal illnesses, particularly where current therapies are unsatisfactory.

Within the past couple of decades, there have been numerous legislative acts aimed to increase pediatric drug development. The FDA Modernization Act (FDAMA) of 1997 offered pharmaceutical companies an extra six months of market exclusivity to conduct pediatric studies and create pediatric labeling. The Best Pharmaceuticals for Children Act, passed in 2002 and 2007, provided methods for studying drugs in pediatrics.[2] It called for (1) identifying and prioritizing drugs that need to be studied in children and (2) conducting studies on priority drugs if manufacturers do not complete them.

"The lack of data in pediatrics leads to drugs being used off-label and without sufficient knowledge of doses, tolerability, and efficacy."

Even though these Acts are currently available to promote pediatric drug trials, since the majority of medications still do not carry pediatric labeling, we need to provide additional incentives to encourage more research in the pediatric population. The extremely valuable information gained through pediatric drug trials will not only reduce the risk of adverse effects in children but will also allow children to safely use medications that have been previously unused in the pediatric population. Moving pediatric trials forward will take the combined efforts of many healthcare professionals (*e.g.* pharmacists, pediatricians, researchers, manufacturers and pharmacologists). Additional pediatric randomized controlled trials will provide the necessary information needed to make evidence-based guidelines instead of using expert opinion, case reports, or trial and error to dose medications in children.

SOURCES:

1. Sachs AN, Avant D, Lee CS, et al. Pediatric Information in Drug Product Labeling. *JAMA. 2012;18: 1914-1915.*
2. Background of the Best Pharmaceuticals for Children Act. http://bpca.nichd.nih.gov/about/index.cfm. Accessed May 24, 2012.

"WISE FOOLS" BY: MICHAEL MADDALENA, PHARM.D. CANDIDATE C/O 2016

Michael is the upcoming president of the Phi Delta Chi Professional Pharmaceutical Fraternity Beta Alpha Chapter at St. John's University College of Pharmacy and Health Sciences.

The term sophomore comes from a compound of the Greek *sophos,* meaning "wise", and *moros,* meaning "foolish". Hence, as sophomores, we are literally "wise fools." If this rings true for any sophomore in St. John's University College of Pharmacy and Health Sciences, it is in the sense that we are certainly wiser than we were as freshmen, but we would be fools to think that it is only going to get easier as we progress through the program! While I must acknowledge the upcoming difficulty of the professional portion of our pharmacy curriculum, I must never forget that I am taking this journey with the friends I have made and under the guidance of faculty who have lead those before me to Pharm.D.-greatness!

After joining Phi Delta Chi, the national pharmacy fraternity, during the spring of my first year, I started my sophomore year with a plethora of friends who were ready to accomplish any academic or personal goals set before us. I learned from my fraternity brothers that "for every hour of class, you must put in two hours of study; and for every two hours of studying, you need to relax and enjoy yourself for four." Handling my sophomore year in this manner afforded me with admirable grades, great memories with loved ones, and plenty of time to kick back and enjoy the scenery.

Over the past year, I learned a great deal, especially in respect to my role as a future pharmacist. Classes, such as Introduction to Pharmacoeconomics and Public Health, brought certain aspects of the healthcare profession to light for me. I learned about the importance of medicine on an economic and communal health scale, the most prevalent diseases and conditions in our society, and a myriad of other topics that the students in the graduating class of 2016 will see throughout their working careers.

My sophomore year was not only one of intellectual growth, but of personal growth, as well. Through community service events, I am able to give back to my community and serve as a role model to others who aspire to take the challenge of becoming a learned healthcare professional. For example, during "My Vascular Valentine", we worked with more than 10 Health Science organizations and spent part of the day with middle school children, teaching them all about the heart and assisting them in activities in the spirit of Valentine's Day.

Whether I am spending time with my Phi Delta Chi brothers, falling asleep in my books studying with my fellow "wise fools," or getting caught up in the hustle and bustle of co-curricular activity present at our University, I find myself enjoying every moment of my education here. While I do have days where getting out of bed for class is an uphill battle, I ultimately believe that as a pharmacy student of St. John's University College of Pharmacy and Health Sciences, I have it better than most students ANYWHERE else do.

I hope my fellow "soon-to-be juniors" have a relaxing and enjoyable summer. I look forward to seeing you all at our White Coat Ceremony in the Fall!

Tell us about your pharmacy experiences at rhochis@gmail.com and we will feature your article in our next issue!

AN EXPERIENCE THAT I WILL NEVER FORGET

BY: NANCY SIMON, PHARM.D. CANDIDATE C/O 2016

Exploring cities while getting lost, viewing beautiful sights, and eating delicious food: all highlights of my study abroad experience. This past semester was more than I ever expected; I do not even know where to begin. I participated in the Discover the World program through St. John's University, which included studying abroad in three countries for five weeks each. My first module was Seville, Spain. This was the first year that students were able to study in the city of Seville rather than in Salamanca, where previous students studied. Since St. John's does not have its own campus in Spain, as it does in Paris, France and Rome, Italy, we lodged at a youth hostel, mainly inhabited by traveling students. My next module was in Paris; it was definitely a very pretty city, but also very high-scale. My last and most favorite module was in Rome; I have never eaten so much pizza and pasta in my life, and I loved every minute of it.

It was awesome observing the different cultures and behaviors of the people in these three European cities. I think that is what I loved most about traveling. We also had to factor in studying; classes were either three or four days a week, which meant weekends were the perfect time to explore the rest of Europe. I definitely did not waste any time. The beauty, food, and atmosphere of Seville fascinated me so much that I wanted to visit other parts of Spain and see what it was like and how it was different. I booked a trip to Madrid and Barcelona. They were two very large cities that were so different from the small town of Seville. I really liked the different atmosphere, but after experiencing the city-life of Madrid, and the touristy atmosphere of Barcelona, I was so happy that I had the opportunity to live in a small Spanish town, where I could really embrace the Spanish culture. Almost no one knew English, and there were not too many tourists around all the time. In addition, because Seville was such a small town, my friends and I walked everywhere and really got to know the city. It gave me the opportunity to really take everything in and appreciate it. Another thing I loved about Spain was that everything was affordable.

Everyone received a 'reality check' once we landed in Paris. This big city was a drastic change from living in a small town, but we all adjusted quickly. I explored the classy city; went up the Eiffel Tower; browsed through the shops on the Avenue des Champs-Élysées; and ate delicious food including escargot and frog legs – which may not sound appetizing, but are definitely worth trying!

I was taking it all in, but I wanted to see more. I got the chance to go on a canal in Holland, eat the most amazing waffles in Belgium, take a ride on the London Eye, and attend the St. Patrick's Day Parade in none other than Ireland! Words cannot describe the feeling of being able to see all these beautiful places – I feel truly blessed.

I loved exploring Europe more and more as the days went by, and the day finally came when we moved to Rome. That meant that we only had five more weeks left in Europe and time was of the essence. I completely fell in love with Italy – the history, the people, and of course… the food! I could never have enough gelato and pizza. I will also never forget seeing the Pope and being able to attend Easter Mass at the Vatican, which was such a humbling experience.

As Ralph Crawshaw put it, "Travel has a way of stretching the mind. The stretch comes not from travel's immediate rewards, the inevitable

myriad new sights, smells and sounds, but with experiencing firsthand how others do differently what we believed to be the right and only way."

This past semester's worth of travels is something I will cherish for the rest of my life. I still cannot believe that I had the opportunity to visit so many places, and see how people of different cultures did everything in their own way.

This experience has opened my eyes to the world in ways I cannot describe.

Capri, Italy

I believe that studying outside of my hometown in New York has been extremely essential to my growth, and my mind has definitely been stretched. After this trip, I believe everyone should have the experience of living on the other side of the world and take the time to appreciate different cultures. If you ask me anything about all the places I have been, I could tell you everything about my travels and talk for hours, but it will never compare to actually being there and experiencing it firsthand.

Traveling all across Europe has definitely made me a better person. I see everything in a new perspective now and have learned to appreciate everything in our world – which indeed is a very beautiful place if we explore and find its beauty. After visiting and seeing many countries, my desire for traveling has only increased. I yearn to see China, Brazil, Australia, Alaska, and more. All I have left to look back on my adventure are my pictures and memories, but even those do not do the places justice. I can easily say that the past four months were the best of my life, and studying abroad was an experience that I will never forget.

IMAGE SOURCE:

St. John's University, Office of Global Studies Web Portal
St. John's University, 8000 Utopia Pkwy., Queens, NY 11439
Email: globalstudies@stjohns.edu

THE END OF AN ERA BY: POOJA PATEL, PHARM.D. CANDIDATE C/O 2013

The "end of an era" is a fitting way to describe my rotation this past February with Dr. Gladys El-Chaar at Steven and Alexandra Cohen's Children's Medical Center of New York. As many have heard, Dr. El-Chaar shifted from her long-standing position at Long Island Jewish Medical Center to Winthrop University Hospital, and I was lucky enough to witness the end of her legacy at the former. Despite the fact that Dr. El-Chaar was in the midst of her move, she made my rotation an unforgettable and invaluable experience.

My expectations for the rotation were high, and I knew that I was going to work hard and learn a lot. Dr. El-Chaar did not disappoint. From day one, her ferocious passion for her work and for the children that she cared for was apparent. She spoke with such fervor that you could not help but get just as excited about working with her and hopefully, changing a few lives. Along with her passion came a strong will and high expectations. She expected a great deal from her students, and we could tell that we would have to work hard to live up to her standards. These standards made the rotation challenging – not because Dr. El-Chaar held you to them, but because you held yourself to them.

The care and attention to detail required when working with any patient is staggering, and with children, the attention required is even greater. Learning under Dr. El-Chaar helped me understand this.

A typical day began early, heading to the floors to greet the team and to get the patient list for the day at 6:30AM. By seven, we had familiarized ourselves with the patients assigned to our team, and we were meeting up with them for Morning Rounds. Although I was lucky to be Dr. El-Chaar's last rotation group at Long Island Jewish Medical Center, I was even luckier for having the opportunity to work with Dr. Robert Katz.

Dr. Katz was an amazing Pediatrician who happened to be teaching the team that we were assigned to during my rotation. He would oversee the doctors and residents, as well as advise them on cases that were more difficult. Therefore, while the doctors discussed cases and Dr. Katz taught us, my mornings were always an educational experience. Even the doctors on the team did not disappoint; you could see that they loved the work that they were doing and they strived hard to improve themselves every day.

After rounds, the day would rush by. We picked a few patients to follow, and then spent the rest of the morning reviewing their charts and profiles. This period would be interrupted at 9AM when Family Centered Rounds began, and we reconvened with the team and visited the patients with their families.

Throughout the day, Dr. El-Chaar's office remained open for questions while she worked, and in the afternoon, she set aside her work and met with us, as well as the resident rotating with her at the time. We spoke about our patients and had open discussions about what we learned. She guided us through our presentations and helped us understand the answers to our own questions. Many times, our presentations raised new questions that we researched on our own; we presented the answers to her the next time that we met. This paradigm encouraged us to conduct our research thoroughly, and by the end of the rotation, we began to anticipate some of the questions before Dr. El-Chaar had the opportunity to ask them. The intimacy of her office allowed us to speak freely and become accustomed to presenting cases in a clear and organized manner without a large audience.

Even though we were busy throughout the day, our meetings with Dr. El-Chaar were never short. We spent long hours dissecting through patient cases and often digressed to related topics. We also learned a great deal about Dr. El-Chaar outside of her role as a professor, and she, in turn, learned a great deal about us. She shared

her experiences with us, and our laughter often echoed throughout the Drug Information Center.

I cannot speak about what Winthrop University Hospital would be as a rotation site, but I do know that no matter what, if you have Dr. El-Chaar as your preceptor, it will be one of the greatest experiences of your life. Do not be afraid of hard work or be intimidated by the high standards that working with Dr. El-Chaar requires. Take her rotations with an open mind, and you will come out finding your brain a lot fuller and creating a lifelong friendship.

REFLECTION ON MY 4TH YEAR OF PHARMACY SCHOOL BY: SLANIXPAUL T. ALEX, PHARM.D. CANDIDATE C/O 2014

Progressing into one's fourth year of college is usually a time of mixed emotions for the average college student. A melting pot of excitement and a sense of accomplishment at the thought of finally graduating after four years of hard work combined with a tinge of sadness at the thought of having to say goodbye to a place full of memories, topped off with a dash of anxiousness over the challenges that await. Entering into the fourth year of college as a pharmacy student only meant one thing to me at the time: I had two more years of school to complete. As you could have imagined, my emotional melting pot consisted mostly of anticipation and panic with very little, if any, exhilaration or relief.

Nonetheless, I was determined to make the most of it. I was ready to take on the battering ram (my therapeutics course[s]) with courage and vigor, and meet it head on at the front lines, which, in this metaphor, was the fourth floor of the library. I vaguely remember the sleepless nights spent in my newfound second home, trying to find the brain capacity to cram in those last minute clinical fun facts right before every exam. The task seemed more daunting every time, even as I became more comfortable with my daily routine, and my body became more and more accustomed to the lack of certain luxuries, such as a full -night's sleep and routine meals. But looking back, it wasn't the self-deprivation of basic human needs the helped me get through fourth year, but rather the few moments that I was able to find here and there to just sit back and relax, and to be with the people that were going through the very same struggles as I.

Elder students have always advised me from the beginning of my college journey that (paraphrased) "it is not the grade on any particular test that you will remember (when looking back on your college experiences), but rather those memories formed and shared with the people who you meet and develop life-long, meaningful relationships with. These people will most definitely have a lasting impact on you, as they help mold and shape you into a mature adult ready to take on the challenges of the real world after graduation. These people will also serve as the glue to help keep you from falling apart, even in your most nerve-wracking moments." This circle of friends made my most recent year of school, and college in general, not only bearable, but also an exciting time in my life where I learned a lot about myself as well as whom I want to become. Whether they know it or not, each one of them has left a lasting impression on me.

If I had to give one piece of advice to a younger pharmacy student, it would be to make your pharmacy school experience more than simply about academics. Take a leap of faith, demolish that mental fortress that you have put up over the years, and reach out and connect with others.

You may get hurt every once in a while, but those moments of shared happiness make it all worthwhile. In addition, while you may not do so well on a test, in the end, it is those memories of shared happiness that you will cherish and look back upon fondly.

INTRAVENOUS ONDANSETRON AND QT INTERVAL PROLONGATION

BY: RAYMOND WU, PHARM.D. CANDIDATE C/O 2013

The 5-hydroxytryptamine type 3 (5HT3) antagonists (*e.g.* ondansetron [Zofran®]) are commonly used in the prevention and treatment of nausea and vomiting in the inpatient setting. Overall, ondansetron is a well-tolerated medication with few side effects. Constipation, dizziness, and headache are the most commonly reported side effects associated with its use.[1] However, on September 15, 2011, the FDA issued a Medwatch Safety Alert for ondansetron in patients with congenital long QT syndrome, a cardiac arrhythmia.[2] The FDA further required GlaxoSmithKline to conduct a thorough study to determine the degree to which ondansetron causes QT interval prolongation.[2]

"Constipation, dizziness, and headache are the most commonly reported side effects..."

Similarly, in 2001, droperidol received a black box warning against prolonging the QT interval and inducing arrhythmias. In response to this warning, providers in the United States began prescribing 5HT3 antagonists more widely, particularly due to the perceived safety profile of these agents.[3] It now seems that ondansetron shares the same mechanism for QTc interval prolongation. Ondansetron is involved in the blockade of the human Ether-à-go-go-Related Gene (hERG) potassium channel in the myocardium, leading to a disruption of the rapid delayed rectifier potassium current (Ikr).[4] This characteristic is shared by several other medications that are more notorious for their QT prolonging effects, including class III antiarrhythmics, cisapride, and droperidol.[4,5]

"... ondansetron shares the same mechanism for QTc interval prolongation [as droperidol]"

Hafermann *et. al.* performed a prospective, observational study in 2001 observing the risk of QT prolongation with ondansetron. Their inclusion criteria for the study were:[3]

- numerous risk factors for drug-induced QT interval prolongation potentially leading to torsades de pointes
  - hypomagnesemia (<1.0 mEq/L)
  - hypokalemia (<3.2 mEq/L)
  - congenital long QT syndrome
  - baseline QTc >500 msec
- female gender
- heart failure (ejection fraction <40%)
- acute coronary syndromes
- old myocardial infarction
- bradycardia (≤50 beats per minute)
- use of drugs that either:
  - prolong the QT interval
  - disrupt the metabolism or distribution of QT-prolonging drugs

The study's investigators defined QTc prolongation as 450 msec for men and 470 msec for women.[3]

Patients in the study received a primary cardiovascular diagnosis and had a baseline 12-lead electrocardiogram (ECG) on admission conducted in the ward or emergency department. About 120 minutes after the first dose of slow-push intravenous ondansetron, patients underwent a second ECG.[3]

The mean interval between obtaining the two ECGs was 3.5 ± 2.14 hours. In the total population, the QTc interval was prolonged by 19.3 ± 18 msec ($P < 0.0001$) within 120 minutes of ondansetron administration. For patients with an acute coronary syndrome and those with heart failure, QTc was prolonged by 18.3 ± 20 msec ($P < 0.0001$) and 20.6 ± 20 msec ($P < 0.0012$), respectively.[3] Following ondansetron exposure, 31% and 46% in the heart failure and acute coronary syndromes groups, respectively, met the gender-related thresholds for a prolonged QTc.[3,5]

This study found that QTc prolongation due

to ondansetron administration was similar to that found in previous studies. When used in patients with cardiovascular disease, such as heart failure or acute coronary syndromes, with one or more risk factors for torsades de pointes, ondansetron may significantly increase the QTc interval for up to 120 minutes after administration.[3]

Hence, from a patient safety perspective, patients who are at high risk for torsades de pointes and receiving ondansetron ought to receive continuous ECG monitoring when receiving ondansetron in the inpatient setting.[3]

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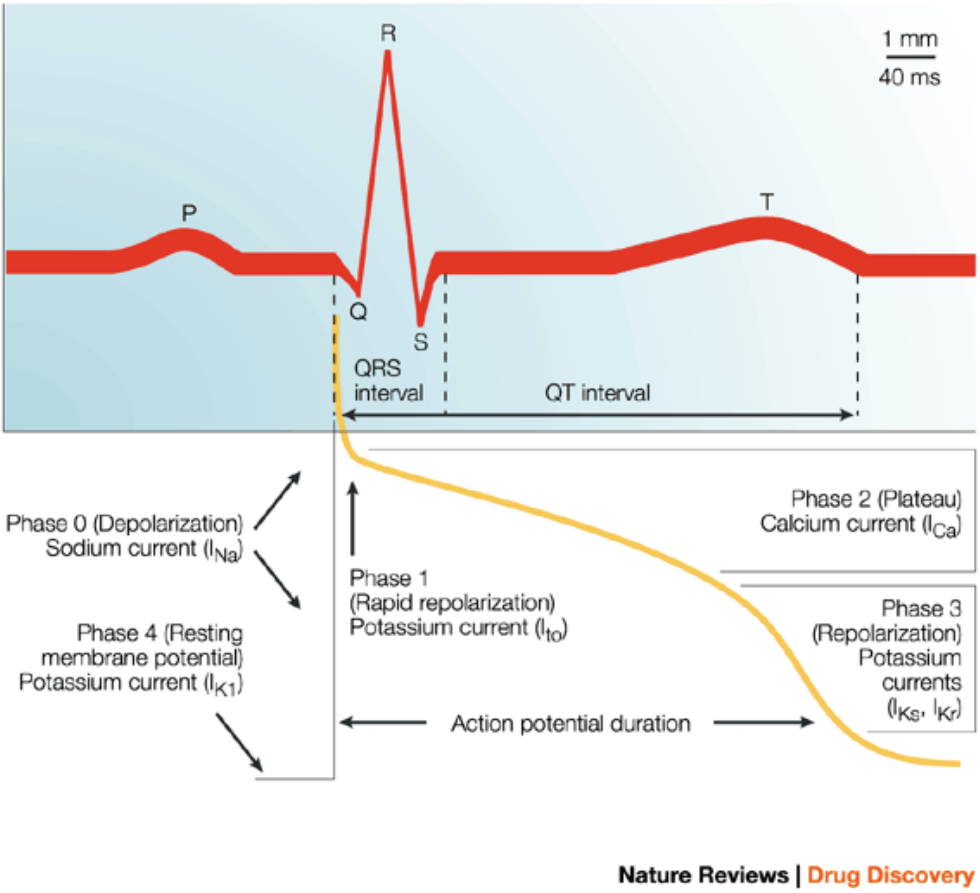
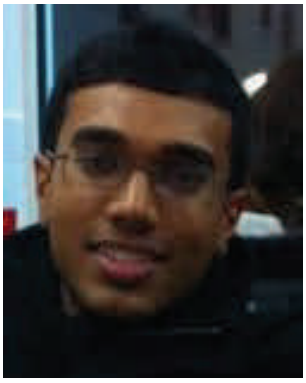


The P wave reflects atrial depolarization, the QRS complex reflects ventricular depolarization and the T wave is indicative of ventricular repolarization. The QRS complex is the upstroke (phase 0) of the action potential. The isoelectric S–T segment is the plateau (phase 2), whereas the T wave is indicative of ventricular repolarization (phase 3). The resting membrane potential corresponds to phase 4.

Image Source: http://www.nature.com/nrd/journal/v2/n6/fig_tab/nrd1108_F1.html

A REFLECTION ON MY PALLIATIVE CARE ROTATION

BY: STANLEY SAJI, PHARM.D. CANDIDATE C/O 2013



I had a preconceived notion that advanced pharmacy practice experiences (APPEs) were just an application of concepts and therapies learned in pharmacy school. Little did I know how *real* APPEs became…

During my third rotation, I worked with Dr. Maha Saad, Assistant Clinical Professor in the Department of Clinical Pharmacy Practice at St. John's University College of Pharmacy and Health Sciences and clinical pharmacist on the Palliative Care / Geriatrics Consult Team at Long Island Jewish Medical Center (LIJMC). The rotation was emotionally challenging yet an enriching learning experience that opened my eyes to a side of healthcare rarely seen by students on rotations.

One key lesson I learned from the experience was that it is imperative to treat a patient with respect and compassion while simultaneously addressing their medical problems. Patients may not always opt for treatment but instead request comfort care to help ease terminal conditions so that they may pass away peacefully and painlessly. All parties involved must respect this choice. As a pharmacy student, I aim to help improve patients' health and save lives, but in this area of medicine, I realized that a cure not always the goal of therapy. Sometimes the focus is on treating patients' symptoms and ensuring that they are comfortable.

"...it is imperative to treat a patient with respect and compassion..."

I saw patients diagnosed with end stage renal disease (ESRD), terminal cancer, and even such severe Alzheimer's that they could not remember their own family members. I witnessed firsthand the potential severity of a deep vein thrombus (DVT) if a patient is immobile for an extended period of time; this justified the practice of providing DVT prophylaxis with heparin. There were also many sickle cell disease patients, some of whom presented to the hospital when they were in a pain crisis and actively dying. Sadly, I observed a patient pass away in a hospital bed, which was definitely a life-defining experience because the patient was around my age. It just went to show me how short and fleeting life can be...

Many patients admitted into the hospital were on extensive medication regimens (polypharmacy). As part of the Academic Service Learning component of my rotation, I screened patients' regimens for any medication errors and contraindications, as well as correct indications, dosages, and other related issues. I made recommendations for adjusting doses and intervals of medications prescribed for pain, dementia, and depression. As Dr. Saad and I rounded on many cancer patients, counseling and consoling was a part of our daily activities. Moreover, we held family meetings to help form advance directives for loved ones who were incapacitated and unable to make independent decisions.

"The rotation was emotionally challenging yet an enriching learning experience that opened my eyes to a side of healthcare rarely seen by students on rotations"

Working alongside the palliative care team was difficult at times due to the nature of the cases that I saw with my own eyes. However, this rotation greatly increased my knowledge of geriatric and end-of-life care. This rotation was a unique experience for me, providing insight on the process of death and understanding how patients prepare for their final moments. Caring for the geriatric and palliative population is not something anyone is cut out for; and those that choose to practice in this field warrant a certain level of respect from society.

RHO CHI EXECUTIVE BOARD MEMBER INSIGHT: BETHSY M. JACOB BY: MOHAMMAD A. RATTU, PHARM.D.

We sometimes need to step back and look at our foundations for success. Clearly, without the support of past and present Rho Chi executive board members, there would be no Rho Chi Post newsletter. From our May to September issues, we will learn about each of our local chapter's board members on a more personal level. Our insight will predominantly include their nicknames, hobbies, favorite quotes, reasons for accepting the Rho Chi invitation, and motivations for becoming part of the executive board.

Our second executive board member insight is with Bethsy M. Jacob, current fourth year student pharmacist and Historian of Rho Chi.

Q: We all have nicknames, for one reason or another. What have people called you, either in the past or right now in college?

A: "Pepsi" is what my friends called me back in high school, as it somewhat rhymes with my name. At St. John's University, a few friends have started calling me "Jenny". It has nothing to do with my name, but Jenny is a good friend of mine. It started as a joke, but now I have started to answer to "Jenny!"

Q: Oh, so that is why one of your online profile pictures was a Pepsi logo! Ha-ha! What are some of the things that you like doing outside of pharmacy?

A: I really enjoy reading books, especially the ones that I find hard to put down until I have reached the end. I also love to play sports, like tennis. Lastly, I like canvas painting – it would be amazing to, someday, have at least one piece of mine displayed in an art gallery.

Q: Canvas painting is definitely something that I would like to get back into myself – I used to paint back in high school! So, what is your favorite quote?

A: I actually have two favorite quotes! The first is: "If we find ourselves with a desire that nothing in this world can satisfy, the most probable explanation is that we were made for another world." - C.S. Lewis, one of my favorite authors. The second is: "Not all of us can do great things. But we can do small things with great love." - Mother Teresa.

Q: Two quotes from two great individuals. Now, when you received an invitation to the Rho Chi Academic Honor Society, why did you accept it?

A: Firstly, I thought that it would be an honor to be a member of Rho Chi, pharmacy's premier academic honor society. As a prestigious organization, it would allow me to grow as a student and as a professional through active involvement. Rho Chi would also be a platform to meet other students and faculty members – these people could provide me advice on achieving my own professional goals.

Q: Ah yes, there is definitely an element of networking within our local chapters. Finally, what was your impetus for applying to an executive board position?

A: I applied for an executive board position because I wanted to develop myself as a leader and garner new skills. I understood the executive board position would ask me to become more involved and promote the profession of pharmacy, at least on our campus. As a result, taking this first step has truly opened doors to new opportunities and experiences, and I have learned quite a lot since my induction into Rho Chi.

We thank Bethsy for taking the time to provide us with this insight, and look forward to highlighting the other Rho Chi executive board members.

If you have any additional questions for Bethsy, please email her at: bethsy.jacob08@stjohns.edu!

MY PHARMACY JOURNEY BY: JENA MARION, PHARM.D. CANDIDATE C/O 2013

I have traveled a lot these past few years. I have packed and unpacked suitcases, measured three-ounce bottles of liquids, and printed plenty of boarding passes. Most of my trips were for business, but a few were for pleasure. Pharmacy, however, followed me along on each one of my journeys.

My first trip this year took me up north to Buffalo, NY for the American Pharmacists Association – Academy of Student Pharmacist (APhA-ASP) Region I Midyear Regional Meeting. As the outgoing Region I Member-at-large, I helped to set up events, run educational sessions, and network with an entire region of student pharmacists. My term as a regional officer taught me a great deal about multitasking, communication, and time management. It also rewarded me with experiences and friendships that I will treasure long after my college years. My fellow regional officers taught me about patient care, policy, advocacy, and our pharmacy profession as a whole; in turn, I shared my passion for pharmacy and enthusiasm for professional involvement.

Shortly after returning from Buffalo, I reunited with many of these same people in the bright, lively city of New Orleans, Louisiana (NOLA) for the APhA Annual Meeting and Exposition. Each year's meeting seems to top the last one, and my time in NOLA was no exception. I kicked off the weekend with a "tweet-up" at the APhA Opening General Session, and had the opportunity to live-tweet the results of the APhA-ASP House of Delegates to some of my new followers. By watching student pharmacists advocate for the issues affecting our profession today and using social media to share our messages, I could not help but envision ways that pharmacists will soon use the internet to advocate for our profession to colleagues, legislators, managers, and even our patients.

I also had the chance to represent the St. John's University College of Pharmacy and Health Sciences in the National Patient Counseling Competition. The experience of having a microphone clipped to my white coat and a hidden camera watching my every move while counseling was one that I will not soon forget. However, as a few dozen of us waited outside the counseling room for the results, I felt camaraderie with my fellow student pharmacists as a group committed to patient care and education. In addition, although I did not make it past the first round, it reminded me of how critical our jobs are as pharmacists to maintain the health of the public and keep our patients well.

As the weekend ended, I sat surrounded by students and professors at our annual chapter dinner. As we spoke about the sights of the city and shared the things that we learned over the course of the meeting, I felt honored to be sitting among a group of pharmacists and student pharmacists dedicated to this multi-faceted profession. Students attended sessions about Medication Therapy Management (MTM) and new drug therapies, and professors attended sessions focused on the achievements of student chapters from across the country; in both cases, the new perspectives taught us much about our shared profession.

"...reminded me of how critical our jobs are as pharmacists to maintain the health of the public and keep our patients well."

I was excited to escape class, rotations, work, and the everyday grind for a bit. Just as the warm weather set in over New York, I packed my bags for a cruise to the Eastern Caribbean. I quickly learned, however, that escaping pharmacy was not an easy feat! At breakfast on the second day at sea, I met an elderly man, traveling with his wife, who had diabetes. We chatted about metformin and insulin over omelets that morning. On the fifth day, while soaking up some sun on the beach, I met a couple whose daughter also

attended St. John's University. We started talking about over-the-counter (OTC) sunburn remedies, and then covered everything from video games and cooking to our favorite New York sports teams in an hour-long conversation. I only knew each of these people for a few short moments, but after they discovered that I was an aspiring pharmacist, they opened up to me with stories about their health, families, and lives. Even after spending nearly six years working and rotating in numerous different pharmacies, I still find these experiences humbling.

Now home and ready to begin the next chapter of my education, I have no plans in the immediate future for travel. For the next few months, I can only fondly remember my experiences traveling the country creating memories. These experiences remind me why I wanted to become a pharmacist in the first place. I want to:

- Have the chance to mentor others in the same way that I was under the wing of my pharmacists, professors, preceptors, and friends;
- Become a positive agent of change as an advocate for the profession of pharmacy, working with others to mold it into a profession that I will soon be proud of and excited to practice; and
- Educate the public about medications and health conditions – a resource for my patients as one of the most accessible healthcare professionals.

TRANSPLANTATION IN HIV +/- HBV/HCV PATIENTS

BY: JAYOUNG PARK, PHARM.D. CANDIDATE C/O 2013

Traditionally, human immunodeficiency virus (HIV)-infected patients have generally been excluded from organ transplantation.[1] One of the principal concerns was that immunosuppression would accelerate HIV/acquired immune deficiency syndrome (AIDS), resulting in increased mortality and a "waste" of organs.[1]

A study entitled, "Opportunistic Infections and Neoplasms Following Liver and Kidney Transplantation in the HIV infected Recipient," was presented at the 13th International Conference on Malignancies in AIDS and Other Acquired Immunodeficiencies (ICMAOI) held by the National Institute of Health (NIH).[1] It stated that although HIV does not progress in HIV-positive transplant recipients, there is a much higher incidence of organ rejection.[1] As Peter Stock, MD, PhD, professor of surgery at the University of California at San Francisco reported, such two to threefold higher incidences of organ rejection in HIV-positive patients than in HIV-negative patients indicated the presence of a very dysregulated immune system rather than an absence of immunity.[1]

An NIH-funded multicenter trial evaluated the effect of HIV infection on graft function and survival, as well as the effects of transplantation and post-transplant immunosuppression on HIV progression and markers of immune function/activity.[2] There were 150 kidney and 125 liver transplants at 18 centers across the United States who received three to four years of follow-up.[2] Patients selected for the study had CD4+ T-cell counts greater than 200 cells/mm^3 in kidney recipients and greater than 100 cells/mm^3 in liver recipients.[2] Of the 150 kidney transplant recipients, 20% were co-infected with hepatitis C virus (HCV) at baseline.[2] The median follow-up was 3.6 years.[2] Roughly 25% of patients had a history of opportunistic infections before transplantation.[2] Among the 125 liver transplant recipients, 69% at baseline were co-infected with HCV, and the median duration of follow-up was four years.[2]

"... although HIV does not progress in HIV -positive transplant recipients, there is a much higher incidence of organ rejection."

For the 150 kidney transplant recipients, researchers reported that HIV generally remained suppressed and CD4+ counts remained relatively

stable.[2] When given antithymocyte globulin (ATG), the patients' CD4+ counts were depleted for one year; yet, there were minimal opportunistic infections during the time that it took for their CD4+ counts to increase again.[2] The investigators did see a higher incidence of serious bacterial infections, about twofold greater, in the patients whose CD4+ counts were depleted.[2] Both patient and graft survival were similar to that in the general population at one and three years.[2]

This high incidence of organ rejection in HIV-infected patients in an absence of HIV disease progression leads to an interesting message.[2] It seems that HIV is not the issue, but rather, the presence of a very dysregulated immune system could be more responsible.[2] Research is underway to explore the mechanism behind the high rate of rejection.[2]

"It seems that HIV is not the issue, but rather, the presence of a very dysregulated immune system could be more responsible."

Other observations worth attention are the differences in graft survival in HIV patients co-infected with Hepatitis B virus (HBV) or HCV compared with the mono-infected controls.[3] Graft survival in co-infected patients at three years was 59%, while it was 67% in the mono-infected controls.[3] Compared with patients mono -infected with HBV, HIV-positive liver transplant recipients co-infected with HBV did just as well with their transplants for five years, supporting the belief that HIV is not the problem but rather the co-pathogens are.[3]

However, the three-year survival rate in the HIV-HCV co-infected patients was a different story; it was 11% higher than with patients mono-infected with HCV.[3] Also, the incidence of organ rejection in the HIV-HCV co-infected patients was twofold higher than that of HIV-HBV co-infected patients.[3] Organ transplantations for co-infected patients with HCV (and not much for those with HBV) are opposed in many centers due to the low survival rates.[3]

As Dr. Stock stated, treating rejections creates another dilemma, as rejection becomes an independent predictor of graft loss and severe HCV recurrence (where control over the virus and the co-pathogen is lost when these patients are immunosuppressed).[1] There has been no evidence of significant HIV disease progression on allograft function.[1] A high incidence of organ rejection is a concern in kidney transplant recipients, as is the possible poor clinical outcome in HCV-co-infected liver transplant recipients.[1] The data observed in the trial indicated that transplantation should not be absolutely excluded as a treatment option for patients with well-controlled HIV disease, whereas its practice is opposed in patients co-infected with HBV or HCV.[1]

The mechanisms behind the high rate of rejection in HIV-positive patients require further studies. In addition, the association between the current treatments for treating these viruses and the risk of cancer may be another valuable topic for further investigation.

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MATCHING CHALLENGE: LOOK-ALIKES, SOUND-ALIKES

BY: ADDOLORATA CICCONE, STUDENT COPY EDITOR

The following medications are easily confused.
Try to match each one with its corresponding fun fact.
*If you need help, please view the answers on **page 23**.*

1. This capsule should be swallowed whole; if chewed or dissolved orally, oropharyngeal anesthesia may occur, which poses a choking hazard. Drinking a glass of water can help bypass this potential adverse effect.
2. This capsule (indicated for Crohn's disease) should be swallowed whole. The inhaler or solution for nebulization (indicated for maintenance treatment of asthma) predisposes patients to oral fungal infections, which can be prevented by rinsing the mouth with water after each use.
3. Like the other agents in its class, this angiotensin-converting enzyme inhibitor (ACEi) crosses the placenta and damages fetal development. Due to this teratogenicity, these agents are contraindicated during pregnancy.
4. In comparison to other anxiolytic agents, this drug is relatively less sedating and may thus be a more suitable choice in the geriatric population when an anxiolytic is indicated.
5. This antibiotic is available in both injection and topical dosage forms. Concerns related to adverse effects range from nephrotoxicity to pruritus.
6. This potent loop diuretic is approximately equivalent to 40 mg of furosemide, 20 mg or torsemide, and 50 mg of ethacrynic acid.
7. This product is available in 150 mg and 300 mg tablets and is usually dosed once daily for the treatment of Major Depressive Disorder.
8. This product is available in 100 mg and 150 mg tablets and is usually dosed twice daily for the treatment of Major Depressive Disorder.
9. This centrally acting skeletal muscle relaxant has a black box warning cautioning against the abrupt discontinuation of intrathecal administration, for it is associated with causing high fever, altered mental status, rebound spasticity, muscle rigidity, and rhabdomyolysis, potentially leading to organ failure or death. At low oral doses, this agent has an off-label indication for hiccups.
10. This opiod partial agonist is combined with the opiod antagonist naloxone in a new sublingual film formulation. Since the film is dosed the same as the previously available sublingual tablets, prescribers can switch patients between dosage forms; however, in comparison to the tablets, the film has a slightly greater bioavailability, dissolves more quickly, tastes better, and can be cut for dose tapering.

A. Bacitracin
B. Baclofen
C. Benazepril
D. Benzonatate
E. Budesonide
F. Bumetanide
G. Buprenorphine
H. Bupropion SR
I. Bupropion XL
J. Buspirone

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NALOXONE DISTRIBUTION PROGRAMS

BY: MAHDIEH DANESH YAZDI, ASSOCIATE STUDENT EDITOR

Special Thanks to Dr. Tomasz Jodlowski, Assistant Clinical Professor in the Department of Clinical Pharmacy Practice at St. John's University College of Pharmacy and Health Sciences, for his contributions to this article

In the 1990s, major urban and rural areas across the United States grappled with a common problem: drug addiction. At that time, the drugs of choice were illicit substances (i.e. heroin). In order to combat the overwhelming number of deaths due to overdose of these drugs, many cities began using naloxone distribution programs. Naloxone (Narcan®) is a short-acting *mu* receptor antagonist used in cases of opioid overdose. It works by competing with opioids at *mu* receptors, thus, preventing them from exerting their pharmacological effects, the most dangerous being respiratory depression. Since most abused drugs, whether illicit or prescription, are derived from opioids, naloxone plays a life-saving role for many patients addicted to these drugs. Naloxone (Narcan®) essentially reverses opioid activity and allows the patient to breathe again.

"Naloxone (Narcan®) is a short-acting *mu* receptor antagonist used in cases of opioid overdose."

When initiating the program, it was hoped that with these naloxone kits, people near an addict would recognize the onset of symptoms and be able to inject the addict with the life-saving drug. This is a harm-reduction strategy, where a public health organization tries to reduce the consequences of harmful behavior such as drug abuse, as opposed to stopping the behavior itself. Chicago pioneered the movement, and it has since spread to other major cities, including: Milwaukee, Los Angeles, Boston, Baltimore, New York City, New Mexico, and San Francisco. These programs also exist in other countries, such as Canada and Australia.

Such strategies have many opponents. They argue that these programs encourage people to continue their addictive behavior because it gives them a false sense of security about the negative consequences of their behaviors. This, they claim, encourages further drug abuse. The federal government is among these skeptics, and it has openly stated its opposition to the implementation of such programs. Proponents argue that these programs are effective in reducing the number of deaths due to drug abuse and that they do not increase the incidence of addiction.

However, with the current increase in drug abuse, specifically prescription drug abuse, these programs are once again relevant. Prescription drugs recently superseded illicit substances in the number of addicts and deaths related to overdoses. According to the Centers for Disease Control (CDC), in 2007, over 12,000 people died of prescription drug overdoses. In fact, prescription drug abuse accounted for more death than heroin and cocaine combined. This is especially true for rural areas, where people are twice as likely to overdose versus city residents. With less access to immediate medical care, naloxone kits may be the best chance some individuals have to survive.

"... prescription drug abuse accounted for more death than heroin and cocaine combined."

For example, in Scott County, Indiana, prescription narcotics are the new drugs of choice for abuse. In this small town with a population of 24,000, nine people have died this year alone from prescription drug overdose. Naloxone kits may prevent such deaths, as they have in large cities. A study assessed the naloxone distribution program in New York City. About 82 participants stated that they had used naloxone: 68 overdose patients survived and the fate of 14 others was unknown. This data can help public health officials make the case for implementing and expanding naloxone distribution programs.

Despite promising results, there are limitations to such programs. The cost of the drug, clean syringes, and educating addicts place a burden on organizations responsible for these programs; a burden some may not be able to bear. These concerns are further exacerbated by the current economic climate which puts pressure on state and local municipalities to cut back on all programs. Also, as with any injectable drug, there is always the potential for infection if the medication is not properly used, mandating additional training for all those receiving vials.

"It is important to note that the effectiveness data of these programs is not clear-cut."

A meta-analysis of medical literature reviewing these programs from 1990 to 2004 revealed that there is not enough evidence to support a decrease in mortality with the use of these medications. Most data on the issue is anecdotal. Further research and experimental studies are required to prove that naloxone distribution programs are actually effective, particularly in terms of the one major endpoint that matters: saving patients' lives.

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IMAGE SOURCE:

1. suboxoneopioid.files.wordpress.com/2012/04/naloxone.jpg

What are your thoughts on the subject?
Write to our editors at rhochis@gmail.com and we will feature your response in our next issue!

IMPACT OF GENDER AND RACE ON THE EFFICACY OF OPIOIDS

BY: LUNBAO (JERRY) HUANG, PHARM.D. CANDIDATE C/O 2013

Pain is a very difficult condition to manage, as clinicians have only subjective findings to work with. Opioid medications are currently the cornerstones for the management of moderate to severe pain; however, it is often problematic to determine a patient's real 'need' for opioids. Physicians' clinical judgments help to create individualized medication regimens for patients with pain. The need for specialized opioid dosing is most likely multifactorial, including both genetic and environmental predispositions to pain. Health care providers must account for these factors by investigating pharmacogenomic relationships through pharmacokinetic and pharmacodynamic studies. The field of pharmacogenomics is particularly under increasing investigation for the enhancement of drug therapy outcomes.

"Differences in age, gender, and ethnicity have various effects on a drug's receptor binding, potency, absorption, distribution, metabolism, and excretion."

Both age and gender are important determinants of central nervous system (CNS) structure and function. Binding with the *mu*-opioid receptor within the CNS is of particular interest. One study examined age- and gender-associated variations with positron emission tomography (PET) and the radiotracer carfentanil.[1] There were two analyses: first a retrospective analysis of a group of 24 men and 12 women, and second, a prospective study of a group of 12 men and 18 women. This study found that the *mu*-opioid receptor binding potential (B_{max}/K_d) increased with age in neocortical areas of the brain. Furthermore, there was higher *mu*-opioid binding in women. In-vivo *mu*-opioid binding declined in postmenopausal women to levels below those of men.[1] This indicates that women's reproductive status (reproductive age versus postmenopausal) may influence the function of CNS opioid receptor systems. Therefore, data suggests that both age and gender are important variables to consider in the investigation of opioid systems in humans.

A study of pentazocine, an opioid that acts at *kappa*–receptors, revealed better postoperative analgesia in females than in males.[2] There was a follow-up study for patients undergoing surgery for the removal of their wisdom teeth. The study compared the analgesic efficacy of two other predominantly *kappa*–opioid analgesics, nalbuphine, and butorphanol. Results confirmed that nalbuphine and butorphanol produced significantly greater analgesia in females as compared with males. Authors concluded that *kappa*–opioid analgesia is greater in females than in males, most likely due to differences in *kappa*–opioid–activated endogenous pain modulating circuits.[3]

"...kappa opioid analgesia is greater in females than in males..."

Metabolism of opioid medications also affects the efficacy of opiods. Race is one of the determinants of CYP450 2D6 variability. The prevalence of CYP2D6 poor metabolizers is approximately 6–10% in Caucasian populations, and as low as 2% in Asian populations.[4] The frequency of poor metabolizers among blacks is greater than that for whites. In addition, 2D6 enzyme appears to be greatest among Middle Eastern and North African populations.[5] As we know, morphine is metabolized hepatically via conjugation with glucuronic acid. The main metabolites are morphine-6-glucoronide (active analgesic) and morphine-3-glucuronide (inactive). Minor metabolites include morphine-3-6-diglucuronide, normorphine (active), and morphine 3-ethereal sulfate. The body metabolizes oxycodone via CYP3A4 to noroxycodone (weak analgesic), noroxymorphone, and alpha- and beta-noroxycodol. CYP2D6 also mediates oxycodone metabolism to produce oxymorphone (analgesic), alpha-, and beta-oxymorphol. Codeine is also bioactivated to morphine, a strong opioid agonist, by CYP2D6.

The efficacy and safety of codeine, morphine, and oxycodone are subject to CYP2D6 polymorphisms. Codeine has little therapeutic effect in patients who are CYP2D6 poor metabolizers, whereas there is a higher risk of morphine toxicity in ultra-rapid metabolizers. We fortunately have information interpreting CYP2D6 genotype test results to guide the dosing of codeine.[6]

"The field of pharmacogenomics is particularly under increasing investigation for the enhancement of drug therapy outcomes."

In 2011, there was an announcement calling for translational and genetic research for identifying new targets for new analgesics to be developed based on pharmacogenomics.[7] Voltage-gated sodium, calcium, and potassium channels were addressed, for which SCN9A, CACNA1B, KCNQ2, KCNQ3, and yet undiscovered receptors could become new targets for pain control. Research on the genetic modulation of pain has already identified variants in these genes; pharmacogenetic assessments of new analgesics could be relevant. The increased number of pharmacogenetic modulators of analgesic actions presents opportunities for broader clinical implementation of genotyping information.

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MATCHING CHALLENGE: LOOK-ALIKES, SOUND-ALIKES (ANSWERS)

BY: ADDOLORATA CICCONE, STUDENT COPY EDITOR

*Go back to **Page 19**?*

1 = D, 2 = E, 3 = C, 4 = J, 5 = A, 6 = F, 7 = I, 8 = H, 9 = B, 10 = G

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PROTON PUMP INHIBITOR USE AND COMPLICATIONS

BY: LAUREN KAVESKI, PHARM.D. CANDIDATE C/O 2013

We see proton pump inhibitors (PPIs) used in many medication regimens, but it is unknown whether the majority of patients receive these medications for appropriate durations or indications. For all labeled indications, other than Zollinger-Ellison Syndrome (a rare condition characterized by damaging gastrin hypersecretion and subsequent hydrochloric acid eviction from gastric parietal cells), the length of prescription PPI use should not exceed eight successive weeks.[1] This class of medications is readily accessible over the counter (OTC) with a projected usage of 14 days.[1] Extended PPI consumption is indicated for patients taking certain medications that augment the risk of a gastrointestinal bleed, such as long-term oral steroids, non-steroidal anti-inflammatory drugs (NSAIDs), and clopidrogel (Plavix®).[1]

Using PPIs for prophylaxis against ulceration of the gastrointestinal track remains an off-labeled indication, and it is unknown whether there is a better class of medications for this indication. The PPIs available in the United States are rabeprazole (Aciphex®), dexlansoprazole (Dexilant®), esomeprazole (Nexium®), lansoprazole (Prevacid®), omeprazole (Prilosec®), pantoprazole (Protonix®), esomeprazole / naproxen (Vimovo®), and omeprazole / sodium bicarbonate (Zegerid®). Omeprazole, omeprazole / sodium bicarbonate, lansoprazole, and pantoprazole are now available as generics, and each of these, except pantoprazole, are available as OTCs.[1,2]

Reports from MedWatch© motivated a number of investigators to conduct epidemiological studies, including but not limited to prospective and retrospective cohorts, case-control trials, medical chart reviews, and statistical data analyses on larger studies such as the Women's Health Initiative. There was conflicting evidence regarding the magnitude and existence of these associations.[2] Although these studies were individually weak (as they could not evaluate causality; hence, only associations), their quantity has demanded clinical attention.[2]

Enclosed within the eighth edition of DiPiro's, there is a chilling collection of adverse drug events associated with PPIs.[3] Data reveals that PPIs diminish the absorption of certain nutrients, such as iron, calcium, and cyanocobalamin (vitamin B12), and thus amplify osteoporotic pathogenesis and fracture risk.[3] This class of medications may also cause an overgrowth of bacteria, increasing the risk of enteric infections and community-acquired pneumonia.[3] Moreover, *Clostridium difficile* (*C. diff.*) infections may increase due to the more alkaline gastrointestinal milieu.[3] Regardless of these issues, the message currently conveyed to readers is that long-term PPI use is "relatively safe."[3]

"...*Clostridium difficile (C. diff.)* infections may increase due to the more alkaline gastrointestinal milieu"

Furthermore, in the subject area of bone fracture risk, studies are in disagreement. The proposed pathophysiology of enhanced fracture risk is a hindrance in the proton/potassium ATPase in osteoclasts and/or thwarting in calcium absorption.[3] However, calcium absorption is profoundly reliant on other variables, such as the presence of vitamin D, the calcium salt ingested, and the particular individual.[3] Fracture risk is a more recent concern, as there is apparent association between hip, wrist, forearm, and spinal fractures and PPI use.[4] Alas, the data is diverse and at odds.

One sizeable epidemiological study unearthed that PPI ingestion correlated with a 25% increase in total fracture risk and a 47% increase in spinal fracture risk in post-menopausal women.[4] We need to remain mindful that these are not absolute risks; instead, they are odds-ratios that estimate relative risk. Relative risk conveys more reliability than the odds-ratio measurement, particularly if the incidence of the event is more than

10%. This particular study did not provide data to calculate the incidences of spine, wrist, or overall fractures; thus, it was not possible to computer the absolute risk.[4] The discrepancy existing between the absolute risk of PPI users and nonusers was not quantifiable; so, it is not feasible to relay the clinical significance of this finding to the public. For some reason, we have an incidence of hip fracture, but the null hypothesis remains true for this variable: there was no statistical difference between the two groups.[4] Moreover, a noteworthy amount of confounding variables existed within the study (*e.g.* dissimilar baseline characteristics among groups), which may explain the elevated risk that was obtained.[4]

Despite the lack of strength of epidemiological and observational studies, the FDA is proactive. It added the risk of increased hip, wrist, forearm, and spinal fractures to the prescription PPI labeling. OTC PPIs do not have this warning, as they are for short-term use. Since there is only an association between PPIs and fractures with long-term PPI use, the FDA declared that short-term PPI use probably does not increase the risk of fractures.[4]

Fracture risk is greatest in postmenopausal women over 50 years of age who have not already had a fracture.[4] Data also yields an association between PPI use and fractures in elder males; but the data on this area remains conflicting and inconsistent at best. Moreover, there is no firm correlation between bone mineral density and PPI use.[4] Thus, patients should not stop taking their indicated PPIs, and should maintain regular evaluation from their physician every few months to govern whether the PPI is still required. As with any medication, patients should receive the lowest effective doses and durations.

Cases of hypomagnesemia emerged in patients taking PPIs after three months of use.[3] However, the vast majority of those who suffered this side effect took PPIs for at least a year.[3] Hypomagnesemia may occur due to shrunken gastrointestinal absorption of magnesium, secondary to a less acidic atmosphere.[3] If a patient takes medications that deplete magnesium, such as thiazide diuretics, he or she has an augmented risk.[3] It is crucial to ensure that this side effect does not happen in digoxin users, as digoxin toxicity interconnects inversely to serum magnesium levels.[3] Because the myocardium needs magnesium to effectively contract, altered levels prompt life-threatening arrhythmias, in addition to palpitations, tremor, seizures, and muscle cramps and spasms.[3]

"Fracture risk is greatest in postmenopausal women over 50 years of age who have not already had a fracture."

Physicians should acquire baseline magnesium levels and periodically monitor levels in patients who may be candidates for extensive PPIs use or who take other medications that call for magnesium level examining. If hypomagnesemia occurs, it may be irreversible, even with magnesium supplementation.[3] Magnesium levels typically normalize in patients within a week of discontinuation of the causative PPI.[3] Upon removal of the PPI, the patient can receive a histamine-2-receptor-antagonist (H2RA) to manage the rebound hypergastrinemia, as well as to replace the PPI if needed and if effective for the particular patient.[3] Quick administration of intravenous magnesium to correct the situation is appropriate if hypomagnesemia becomes symptomatic or serum magnesium dwindles to less than one milliequivalent per liter.[3] The FDA found no increased risk of occurrence of gastric / colon cancers or unwanted cardiovascular events, especially with omeprazole and esomeprazole, which was a public concern in the past.[3]

PPIs also increase the risk of infections. This holds true for both short and long-term use. This phenomenon is likely due to the PPIs' ability to diminish the body's natural acidic secretions that normally act as a barrier of defense against a plethora of microorganisms. In other words, PPIs, as well as histamine-2 receptor antagonists (H2-blockers) to a slighter degree, make the gastrointestinal system, a more hospitable and wel-

coming place for microorganisms; this allows a change in flora to occur. PPI users are at increased risk for succumbing to gram-negative induced nosocomial pneumonia. Those at highest risk have undergone intubation and used PPIs.[3]

"PPIs also increase the risk of infections."

Upon evaluation of 25 of the references used in the article "New warnings that PPIs (*e.g.* omeprazole) might increase the risk of Clostridium difficile-associated diarrhea" that appeared in Pharmacist's letter in March 2012, 17 epidemiological studies and one meta-analysis discovered a positive association or correlation – they found PPI use to be a risk factor for *C. diff.* infection.[2] Three observational studies discovered no statistical difference in the risk for *C. diff.* for the variable of PPI or acid suppression therapy use.[2] Three studies did not mention PPI use as a risk factor for acquisition of this gram positive, anaerobic, spore-forming bacillus.[2]

Risk factors commonly associated with *C. diff.* infection include:[2]

- recent antibiotic use (especially greater than three used concomitantly) or the use of antibiotics other than oral vancomycin or metronidazole (*e.g.* fluoroquinolones, cephalosporins, clindamycin, intravenous vancomycin, macrolides, and intravenous beta-lactam/beta-lactamase inhibitors)
- use of acid suppressive medications such as PPIs and H2-blockers
- female gender
- increasing age
- recent hospitalization
- Hypoalbuminemia
- Intubation
- malignant disease
- history or renal failure
- inflammatory bowel disease
- irritable bowel syndrome
- methicillin-resistant *Staphylococcus aureus* infection
- use of medications that decrease gastrointestinal motility and NSAID use

It is important to note that these risk factors were from observational studies that can only point out an association and that their data is conflicting. *C. diff.* is part of the gastrointestinal flora in healthy human beings. In the institutional setting, those who receive PPIs are generally critically ill and in the intensive care unit for the treatment of some sort of infection which may require intubation. This patient population is generally elderly and is administered multiple antibiotics. *C. diff.* may invade effortlessly in a more alkaline environment caused by PPI use; however, this infection appears to be more dependent on prior antibiotic use. Clinically, this is applicable to the patient if he or she was recently hospitalized; used a PPI; and had clear diarrhea, abdominal pain, and fever that do not subside after a few days. In addition, a patient is at increased risk of *C. diff.* infection if he or she used a PPI in addition to possessing other risk factors.[2,3]

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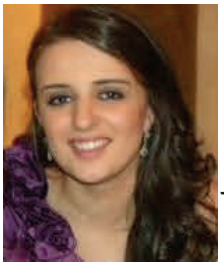
STUDENT PHARMACIST STAR OF THE MONTH: ALBANA ALILI BY: MARIE HUANG, ASSOCIATE STUDENT EDITOR



Each month, the Rho Chi Post has the wonderful opportunity to sit down with an inspiring leader among the student pharmacists here at St. John's University College of Pharmacy and Health Sciences someone who is not afraid to stand apart from the crowd and can be the change he or she wants to see in the world. This June, Albana Alili, a 5th year PharmD candidate speaks to us about legislation, her aspirations, and "running the world."

Q: Before you enrolled in pharmacy school, what other majors did you consider? How did you ultimately decide to choose pharmacy over you other areas of interst?

A: I knew for a long time that I was very interested in pharmacy as a career, but at first I did not know enough about all the different things I could do within pharmacy to make my final decision. The other major I considered was pre-medicine, with a possible minor in something to do with linguistics. They seem different, but I was always interested in the medical field and patient care; I was also good at languages and wanted to expand my knowledge of them, especially for communicational purposes with patients and people in general.

Once I learned more about pharmacy and how involved pharmacists are with their patients in a community setting, how they hold clinical positions in hospitals, and how they are involved with different aspects of pharmaceutical products on a large industrial scale, I realized I could use many of my strengths and pursue many of my interests through the one profession of pharmacy. Moreover, when I heard of the six-year PharmD programs offered through schools like St. John's University College of Pharmacy and Health Sciences, the major became all the more appealing. It slowly but surely was clear to me that pharmacy was the right choice for me.

"I was always interested in the medical field and patient care; I was also good at languages and wanted to expand my knowledge of them, especially for communicating with patients and people in general."

Q: How did you first get involved on campus, and what made you the motivated person you are today?

A: When I first came to St. John's University, I became a Woman in Science scholar and later got inducted into the Phi Eta Sigma honor society, through which I got oriented with campus organizations and what they do. I first got involved in pharmacy organizations freshman year by joining the APhA-ASP chapter at our school. I was able to attend several meetings and events through that organization and later decided to take the plunge and run for an executive board position. I became a patient care projects chairperson and worked with the rest of my E-board to organize Operation Diabetes to raise awareness of the disease, as well as help put together other patient care projects and events for the organization. I realized that I liked being more involved and taking charge.

When I was fortunate enough to be inducted into the Rho Chi Beta Delta chapter at our university, the opportunity presented itself to run for another leadership position. I interviewed to be Vice President and was selected for the position, through which I became significantly more involved on campus and was able to really expand my abilities as a leader. Meanwhile, through my APhA-ASP position, I decided to attend the APhA Annual Meeting in New Orleans, where I was exposed to a great deal of policy and advocacy issues within the pharmacy profession. I became very interested in this area and decided to run for Student Policy & Advocacy Network (SPAN) liai-

son for APhA-ASP. It is through this position, even though my actual term has yet to start, that I was able to attend Legislative Day in Albany where I spoke to legislators, along with other students, about pharmacy policy and attended the annual Pharmacists Society of the State of New York (PSSNY) Convention. I am also currently very interested in Public Policy and Regulatory Affairs in the pharmaceutical industry so I joined the new Drug Information Association chapter at our school and will be attending the annual meeting in Philadelphia in June. As you can gather, one thing led to another as far as involvement goes, but I think the main thing that fueled my motivation to get involved is knowing that we as future pharmacy professionals have to take charge and be leaders for our profession to be taken seriously as an essential component of the healthcare system. Moreover, we have to become active if we want to see any changes or expansions in our profession, as with any area in life.

"... The main thing that fueled my motivation to get involved is knowing that we as future pharmacy professionals have to take charge and be leaders for our profession to be taken seriously as an essential component of the healthcare system."

Q: So you attended APhA's Legislative Day in Albany last month and the annual PSSNY conference just last week. What were those experiences like and what did you take away from them?

A: I was very fortunate to be able to attend both of these events. I did not know exactly what to expect going into Legislative Day as it was my first time, and I was very pleasantly surprised with all that we students were able to do. We had pharmacists and board members of PSSNY, Mr. Howie Jacobson and Mrs. Joanne Beechko, who guided us and were extremely helpful. We went around to state senators' and congressmen's offices to speak to them personally about pharmacy legislature we wish to see passed, which this time was a bill to not only remove the sunset clause on the immunization law allowing pharmacists to immunize but also to expand it in various ways. We explained the bill to them, why it is essential, and the positive impact it could have if passed, with our end goal being to persuade the legislatures to cosign the bill. It was an amazing experience because we were side by side, as students, with actual pharmacists advocating for our profession.

My group leader, Mr. Jacobson, actually let us do most of the talking, which intimidated us in the beginning. However, with time we become very comfortable with the information, and it truly made us feel like professionals. It was this day that we also met pharmacist, pharmacy owner, and PSSNY board member Roger Paganelli, who invited us to help out at the PSSNY convention. We helped the PSSNY board as needed to ensure that all of the events planned at the convention went smoothly. We also had the opportunity to sit in on several continuing education (CE) events taking place, which had to do with different aspects of pharmacy practice and were all very informative. Both of these experiences were profound in that we felt like a real part of the pharmacy profession, which is otherwise difficult to feel when merely a student attending lectures. This is essentially what I brought back from the experiences; we as students must be involved in our profession and remain updated on current issues, because these issues are relevant to us as future pharmacy professionals.

Q: Pharmacy organizations seem to be divided to represent pharmacists in a variety of areas of practice, such as institution, community, industry, and federal. If each has its own interests, do you think there is any way pharmacists of all fields come to form a consolidated, centralized organization and work together to accomplish our goals as a whole?

A: I believe this type of organization is very possi-

ble because the end goal of pharmacy organizations, whether they are community, institution, industry, or federal-related, is the advancement of the profession of pharmacy as a whole. They all want to see their profession highly regarded and their roles steadily expanding, as well as pharmacists in any of these areas constantly excelling. Even for students like myself, being a member of various student organizations with an emphasis on different areas of practice, these same themes apply. Thus I do not see any reason why a centralized organization could not be formed. In fact, if pharmacists from all fields came together to form such an organization, it would be much larger than the individual organizations and would have more power to accomplish goals for the profession. As with countless examples in history, larger numbers are more successful at conveying messages and establishing change. This should apply to accomplishing goals in our profession as well.

Q: If you could pinpoint the most amazing or inspirational experience (anything related to pharmacy or patient care) within the last four years, what would it be?

A: While I had many inspirational experiences throughout the past four years, the most inspirational was Legislative Day in Albany. It really allowed me to see that we can play an active role in what happens with our profession, even as students. I was able to meet and spend time with people very passionate about their profession, and it was contagious. Knowing that what I or one of the fellow students there said to a legislator could have caused them to cosign and support a bill, which would help it get passed later, which would directly impact pharmacy practice, was a tremendous feeling. Through my work with patient care projects in APhA-ASP, particularly Operation Diabetes, I realized the actual definition of patient care. Patients look to us, as the most accessible health care professionals, to provide them with needed services (i.e. blood pressure screenings, counseling on drugs or devices, vaccines). We need to be able to provide for them. This is why being a part of something that could directly influence and expand pharmacists' patient care services was so amazing and inspirational for me.

"Patients look to us, being that we are the most accessible health care professionals, to provide them services that they need..."

Q: In an ideal world, what would you be doing with your PharmD degree ten years from now?

A: I am not quite someone who specifically plans and maps out their future, but, regardless of what direction I take, the main thing I would ideally be doing with my PharmD is putting it to good use. This does not necessarily mean remembering everything about every drug I learned off the top of my head when asked questions. There are many other things we learn throughout our schooling in addition to just information, especially at St. John's University. If I one day make an ethical medical decision based on what I learned in biomedical ethics, I would consider that putting my degree to good use. If I interact with a patient based on what I learned in simulation lab, that would be using my degree as well. If I work on clinical trials for a drug company, using my PharmD will give me an understanding of the underlying mechanisms of medications that others may not fully understand. Furthermore, if I work for the government addressing a public health issue, I will use my degree to understand what the underlying health issues actually are. I would even use my degree if it serves as the stepping stone to a potential second degree. While I do not seek to predict where I will be ten years from now, because I think people should always keep an open mind towards what happens over time, it would be ideal and I would be happy simply using my PharmD to do some good.

Q: If you had the ability to go back in time and talk to your high-school self, what would the conversation be like?

A: When talking to my high school self, especially

nearing the end of high school when I was making college decisions, I would be talking to a somewhat frantic, stressed-out girl. She would be stressing over her SAT scores, whether she was making the right decision on where to go to college, and what she was going to do with her life in general. I would first of all tell her to calm down. I would tell her that she was making the right decisions. Knowing exactly what she wanted to do at that early stage in her life was absurd and would come with time. I would tell her to save her stress and spend more time enjoying that time in her life as it would pass quickly. Most of all, I would tell her to keep an open mind always, and make the most out of college, because she would not believe how much she was going to grow and how much she would learn about herself in the next four years.

Q: If you were forced to listen to a song on repeat for the rest of your life, what song would it be?

A: Right now, if I had to listen to a song on repeat for the rest of my life, I would pick Beyonce's "Run the World." It is so upbeat and so motivating that it just gives me energy and pumps me up when I hear it. My mood tends to be very affected by music, so any song I would have to listen to forever would have to be upbeat, positive, and make me happy and energetic. Also, I have listened to it quite a bit since it came out a while ago and am not sick of it yet, so I think it would be pretty tolerable for the rest of my life.

Q: I agree! I would definitely opt for something upbeat too. What is your most recent guilty pleasure?

A: My most recent guilty pleasure would have to be watching Storage Wars on A&E, a show where bidders bid on abandoned storage units in hopes of finding hidden treasures to sell. It is ridiculously addicting. I have never watched any show like it before, and do not watch too much television in general; but, it is so entertaining that I find myself watching it in my spare time.

Q: Thanks for sitting down with us! Any last words or tidbits of advice for your fellow student pharmacists?

A: No problem, thank you for having me, it is a great honor. My advice for fellow student pharmacists would be to really enjoy and make the most of their time here at St. John's University College of Pharmacy and Health Sciences, as it will be over before they know it. One of the best ways to do this is to get involved in student organizations, especially pharmacy-related ones. One constant theme always surfaces when I talk to anyone involved in organizations: that they wish they started sooner. Being involved also helps shift the focus away from simply attending classes and taking tests, and helps one see the bigger picture and actually feel like an active part of your profession.

"My advice for fellow student pharmacists would be to really enjoy and make the most of their time here at St. John's..."

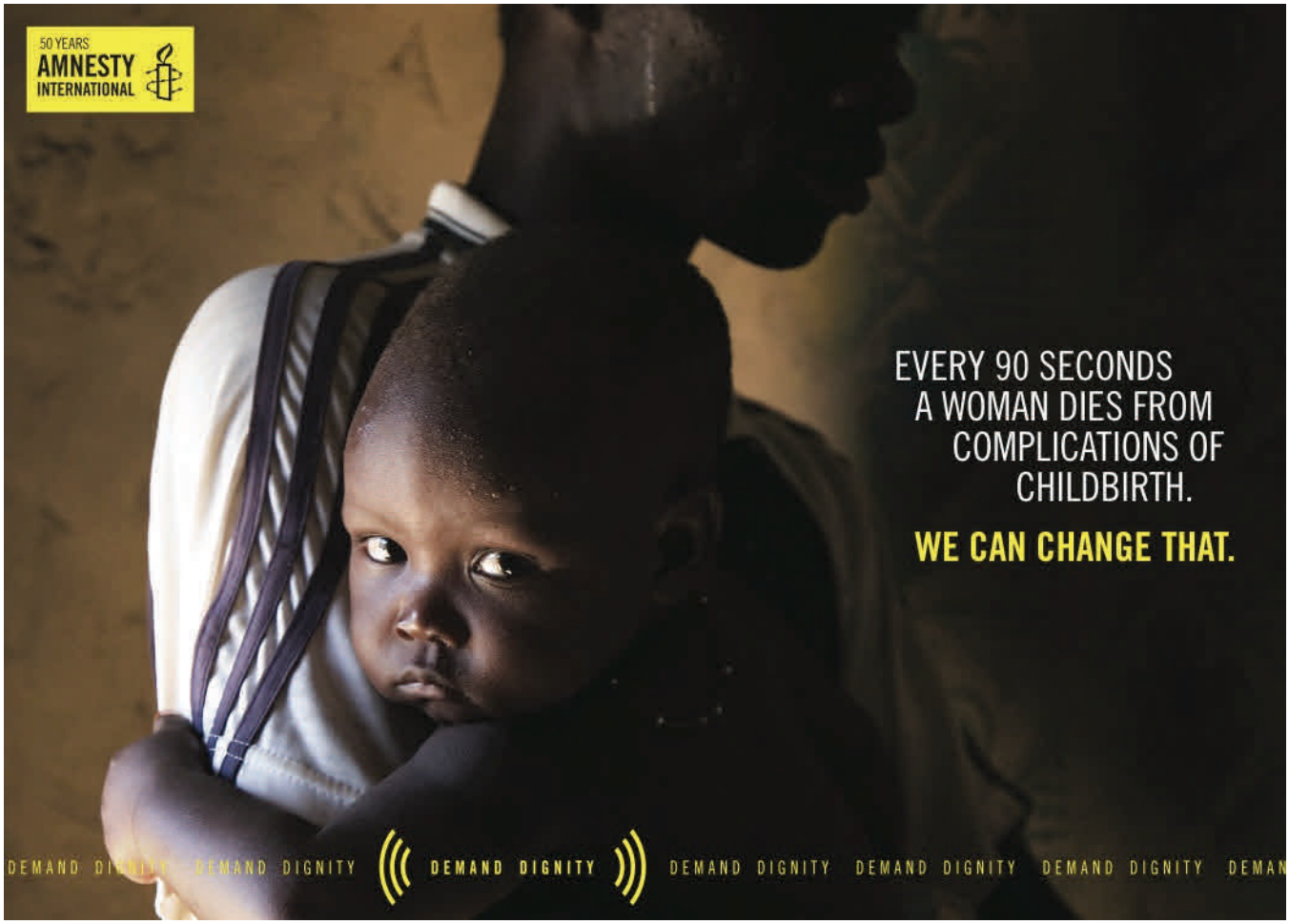
If you have any additional questions for Ms. Alili, you may contact her at albana.alili08@stjohns.edu.

How has pharmacy school changed you?
Write to us at rhochis@gmail.com and we will feature your article in our next issue!

AMNESTY INTERNATIONAL AND PHARMACISTS FOR SOCIAL JUSTICE BY: EBEY P. SOMAN, EDITOR-IN-CHIEF

As a member of Amnesty International and a student pharmacist, I have an opportunity to be a force for social justice in this world. Remember the classes titled "Social and Behavioral Aspects of Pharmaceutical Care" or the "Moral Theology of Health Care" that you took as a first or second year Pharm.D. Candidate? Applying the lessons and principles learned in those classes can make a real difference in the lives of individuals around the world, be they thousands of miles away or simply right in your own neighborhood. Pharmacists have the opportunity to participate in medical mission trips to third world nations to make a real impact. Organizations like Doctors without Borders, Christian Pharmacists Fellowship International (CPFI), and many others are actively seeking pharmacists with vast clinical knowledge to help make positive impacts and change some lives.

Perhaps you may not have adequate finances to pursue such an endeavor. This is where Amnesty International USA comes into the picture. Through Amnesty International, one's voice is heard across the world to initiate meaningful reform and to upload the Vincentian values we hold so dear at St. John's University. Take a moment and visit Amnesty International USA at http://www.amnestyusa.org/ and consider taking action on healthcare issues by improving health in third world nations.



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DR. OZ AND RASPBERRY KETONES

BY: LILA AHMED, PHARM.D. CANDIDATE C/O 2013

Whether you wish to admit it or not, all of us have watched or at least heard of the Dr. Oz Show. I am sure that many of us encounter patients in the pharmacy who say, "I saw this on Dr. Oz; where could I find it?" or "Dr. Oz says this pill is good for my cholesterol." It makes you wonder how accurate these recommendations are and if people should take advice from a television show. Yet, is there evidence to support the use of these supplements?

One of Dr. Oz's most recent episodes discussed weight loss and targeted specific problem areas for five body types. Just one of the many "fat burner" supplements mentioned was raspberry ketones.[1]

What are they?

Raspberry ketones, chemical name 4-(4-hydroxyphenyl)butan-2-one, are the primary aromatic compounds found in red raspberries. They are primarily used in perfumes and food additives to provide a fruity odor. The raspberry ketone's chemical structure is similar to that of capsaicin and synephrine, both of which have lipolytic activity and are associated with weight loss.[1-4]

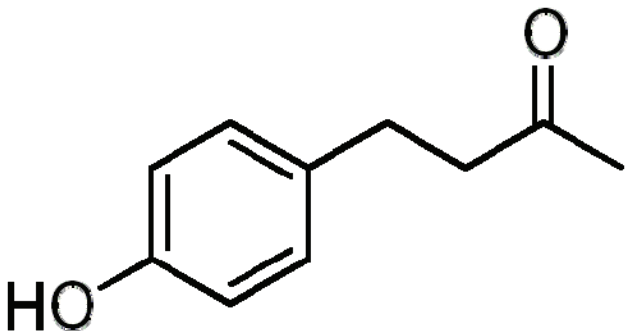

Image Source: http://upload.wikimedia.org/wikipedia/commons/9/9c/Raspberry_ketone.png

How do they work?

Raspberry ketones secrete adiponectin, which, according to Dr. Oz, "naturally tricks your body into acting like it's thin." Adiponectin is a protein used by the body to regulate metabolism. Higher levels are associated with fewer fat stores. Raspberry ketones cause the fat within your cells to break up more effectively, helping your body burn fat faster. Scientists who studied the effects of raspberry ketones on mice observed a higher secretion of adiponectin when compared to controls. Researchers also observed that raspberry ketones decreased the amount of fat in the liver and abdominal fat tissues of mice. These compounds also significantly increased norepinephrine -induced lipolysis in some rat fat cells.[1,2,4]

The Evidence

A Japanese animal study conducted in 2005 evaluated the effects of raspberry ketones on weight loss. Mice were fed high fat diets for six weeks, and then given 0.5%, 1%, or 2% raspberry ketones (in addition to the high fat diet) for an additional five weeks. The results show that raspberry ketones taken with a high fat diet significantly reduce weight gain and increase lipid metabolism by increasing norepinephrine-induced lipolysis. This study concluded that raspberry ketones prevent obesity and fatty liver.[5]

There is insufficient evidence regarding the safety and side effects associated with raspberry ketones, since they have yet to be studied in humans. However, due to a similarity in chemical structure, it is thought that some stimulant side effects, like those associated with synephrine, may be possible. One case reported heart palpitations and shakiness with the use of raspberry ketones.[6]

The only reported interaction associated with raspberry ketones is with warfarin. Raspberry ketones act as CYP 450 3A4 inducers, thereby increasing the metabolism of warfarin in the body. Warfarin doses may need to be increased while taking raspberry ketones in order to maintain therapeutic INR levels.[2]

According to the Natural Medicines Comprehensive Database, raspberry ketones are used topically for alopecia. Raspberry ketones also act as androgen receptor antagonists, which may

have a role in hair growth. They may increase skin insulin-like growth factor (IGF-1) which is involved in promoting hair growth and increasing skin elasticity. In clinical trials, topical raspberry ketones 0.01% applied once a night for five months increased hair growth in 50% of men.[2,7,8]

Therapeutic Recommendations

Although appropriate doses are not experimentally established, the usual dosage is 100 mg once a day at breakfast. This dose can be titrated up if results are not seen in a reasonable amount of time. According to the Dr. Oz Show, one would have to consume 90 pounds worth of red raspberries in order to get the equivalent concentration of raspberry ketone supplements. Clinically, results may be seen in five to seven days and could last for a few months.[1,2]

Take-Home Messages

Raspberry ketones have gained a lot of popularity since their debut on the Dr. Oz Show. As with any advertised weight loss remedy, it is important to use this supplement wisely and not 'abuse' it. At the mention of a weight loss medication, people tend to rely solely on the dosage form and ignore the fact that it works best in addition to proper diet and exercise routines. As Dr. Oz emphasized at the end of this episode, raspberry ketones should be used "to get over the hump, and not as a miracle pill."[1]

SOURCES:

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Image Source: http://www.flickr.com/photos/rubysfeast/7149704201/sizes/l/in/photostream/

PUZZLE: WORD SEARCH

BY: MARIE HUANG, ASSOCIATE STUDENT EDITOR

C F E P I A I I M L R O I

I M I T I T M I I Y L G N

C E F T A Z I D I M E T L

E N I C A K I M A N V O A

C E I L E I M N T O O B I

M P C E L F O A C I F R K

M I I L N E M E I P L A C

I M P I R I F I N M O M C

C I M T C E A O E A X Y I

F O Z I P C O I E E A C P

N A N I L L I C R A C I T

A G M P O L Y M Y X I N B

C E N Y E I M F I X N A E

FIND THE FOLLOWING WORDS:

AZTREONAM
CEFEPIME
POLYMYXIN B
LEVOFLOXACIN
AMIKACIN
TOBRAMYCIN
IMIPENEM
TICARCILLIN
CEFTAZIDIME
GENTAMICIN

NOTICE A THEME?

TRIVIA: What pesky species of gram-negative bacteria do all ten antibiotics cover?

In Memoriam

THE EDITORS AND WRITERS
OF THE RHO CHI POST
EXTEND OUR DEEPEST CONDOLENCES TO
THE FAMILY AND FRIENDS OF OUR DEAR COLLEAGUE

Natasha Vaduthala

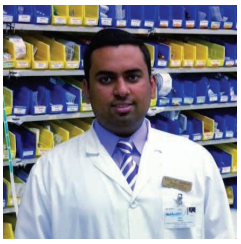
College of Pharmacy and Health Sciences

EXPRESSIONS OF SYMPATHY MAY BE SENT TO:

The Family of Natasha Vaduthala
c/o Dr. Pamela Shea-Byrnes
University Ministry
Newman Hall – Room 229

RHO CHI POST: EDITORIAL TEAM

CO-EDITORS-IN-CHIEF



@ Steve P. Soman *(5th Year, STJ)*
Previously known as Ebey P. Soman, I really enjoy writing very opinionated articles. I strongly encourage all readers of our newsletter to respond with their own literary pieces. I look forward to hearing from you, and welcome your comments and constructive criticisms!

@ Neal Shah *(5th Year, STJ)*
I frequently assist several professors on campus with their research. My goal is to provide my fellow students with research-based information that correlates with clinical pharmacotherapy. If you have any topics of interest or comments on currently-published articles, please do not hesitate to email me!

STUDENT EDITORS

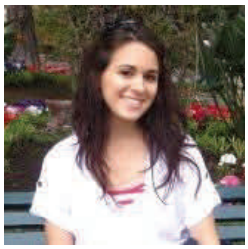
@ Mahdieh D. Yazdi *(5th Year, STJ)*
I like to stay current with all the changes in our profession, both legal and clinical. I hope to keep you informed with all that I learn. Please enjoy Rho Chi Post, and provide us detailed feedback so that we may improve our newsletter.

@ Mohamed J. Dungersi *(5th Year, STJ)*
I am enthusiastic about promoting the pharmacy profession, and what better way to do this than by being a part of the Rho Chi Post? Should you have any comments or concerns, feel free to contact me!

@ Marie Huang *(5th Year, STJ)*
I am in a continuous process of self-definition, and constantly testing the boundaries of this world. I enjoy channeling my inspiration through words and photographs. As a witness to an evolving profession, I look forward to keeping you updated! Who knows where we will be tomorrow?

@ Shannon Tellier *(5th Year, STJ)*
I believe it is important for students and everyone else in the profession to stay informed about current pharmacy events. Rho Chi Post is a great way to continue learning information about what is happening on our campus and in the nation.

@ Addolorata Ciccone *(5th Year, STJ)*
I am thrilled to serve as a Co-Copy Editor of Rho Chi Post. Whether you are brand new to the world of pharmacy, a seasoned veteran of this profession, or anywhere in between, I hope you find our work engaging, relatable, and informative. I look forward to reading your comments and feedback.



@ Aleena Cherian *(4th Year, STJ)*
The Rho Chi Post has been a source of current information and great advice to students and professionals in this evolving profession. After years of experience in media and graphics-related work, it is now my privilege to be a part of this endeavor as a Co-Copy Editor. I hope you learn as much from future editions of the newsletter as I have, and I welcome your feedback!

CO-COPY EDITORS

RHO CHI

The Rho Chi Society encourages and recognizes excellence in intellectual achievement and advocates critical inquiry in all aspects of Pharmacy.

The Society further encourages high standards of conduct and character and fosters fellowship among its members.

The Society seeks universal recognition of its members as lifelong intellectual leaders in Pharmacy, and as a community of scholars, to instill the desire to pursue intellectual excellence and critical inquiry to advance the profession.

THE RHO CHI POST

MISSION

The Rho Chi Post aims to promote the Pharmacy profession through creativity and effective communication. Our publication is a profound platform for integrating ideas, opinions, and innovations from students, faculty, and administrators.

VISION

The Rho Chi Post is the most exciting and creative student-operated newsletter within the St. John's University College of Pharmacy and Health Sciences. Our newsletter is known for its relatable and useful content. Our editorial team members are recognized for their excellence and professionalism. The Rho Chi Post sets the stage for the future of student-run publications in Pharmacy.

VALUES

Opportunity, Teamwork, Respect, Excellence

GOALS

1. To provide the highest quality student-operated newsletter with accurate information
2. To maintain a healthy, respectful, challenging, and rewarding environment for student editors
3. To cultivate sound relationships with other organizations and individuals who are like-minded and involved in like pursuits
4. To have a strong, positive impact on fellow students, faculty, and administrators
5. To contribute ideas and innovations to the Pharmacy profession

CURRENT EXECUTIVE BOARD

Bethsy, Albana, Yining, Elizabeth, and Aleena at the 2012 Induction Ceremony

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Secretary: **Elizabeth Mo**
Treasurer: **Aleena Cherian**
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Faculty Advisor: **S. William Zito, PhD**

UPCOMING EVENTS

Jun 5/6: NYS Part III Board Exam
(Multiple sites and times)

Jun 6: MTM Certificate Program
(21 CE Credits, cosponsored with APhA)

Jun 10: Pharmacy Law & Med Errors Symposium
(Staten Island campus, cosponsored by Getaway Seminars)

Jun 21: Dr. Jarowski Industrial Symposium
(Drug Product Value Enhancement Strategies)

Jun 22-24: "Meeting in the Middle" Conference
(University of Texas International Society of Pharmacoeconomics and Outcomes Research Conference)

Jun 23-26: NACDS Meet the Market Program
(Colorado Convention Center)

Jun 25: Diploma Pick-Up
(Respective Colleges within the University)

Jul 1: Kappa Psi Health Fair
(Lodi Japanese American Citizens League Hall)

Jul 2: ASHP-Accredited Residencies Begin
(Multiple sites and times)

Promote your event through us!

Submit the name, location, date, and time of your venue to our editors at:
rhochis@gmail.com

We welcome all pharmacy-related advertisements