

RHO_{Rx}CHI post

VOLUME 3, ISSUE 6

- IN THE NEWS / POLITICS
- LOCAL EVENTS
- CLINICAL ARTICLES
- PROFESSIONAL ADVICE / OPINIONS
- PUZZLES
- CURRENT EDITORIAL TEAM

A STUDENT-OPERATED NEWSLETTER BY THE
ST. JOHN'S UNIVERSITY COLLEGE OF PHARMACY AND HEALTH SCIENCES' RHO CHI BETA DELTA CHAPTER

Inside This Issue

Organ Donation	1
Lipid Management	2
Arrhythmias on the Rise	3
Biosimilars Market	4
Quote of the Month	6
Japanese Encephalitis	7
Midyear	9
Going International	11
Juvenile Diabetes	14
Clinical Corner	15
Organ Donation	18
Dietary Supplements	19
Crossword Puzzle	22
Look Alike Sound Alike	23
Puzzle Answers	24
Editorial Team	25
Upcoming Events	27
About Us	27

The Importance of Organ Donation: Perspectives and the Lives Affected

By: James Schurr, PharmD Candidate c/o 2014 and Jennifer Miao, PharmD Candidate c/o 2014

With very special thanks to Jessica Melore and Jennifer McDermott, PharmD, BCPS of NewYork-Presbyterian Hospital

Jessica Melore was 16 years old, a senior in high school, and co-captain of the tennis team when her life took a drastic turn. While sitting in a restaurant with her family one night, she almost collapsed. Jessica said, "I started to feel dizzy and light-headed and when that subsided I started feeling pressure pains going from my chest to my neck and a heaviness in my arms." It wasn't until she reached the hospital that she learned that she was experiencing a massive heart attack from a blood clot. Although the left side of her heart was destroyed by the heart attack, Jessica somehow pulled through and returned to school with an implanted device that pumped blood throughout her body for her, known as a left-ventricular assist device (LVAD). This machine kept her alive while awaiting a heart transplant.

Nine months later, Jessica finally received the call that a heart was ready for her, just days before her high school graduation. The transplant was a complete success, allowing her to graduate and go on to attend Princeton University three months later. Jessica's donor was an 18 year-old girl named Shannon, who died in a car accident in 1999. Shannon loved writing and horses. She was also an organ donor, and her decision allowed Jessica a second chance at life. "The reason I'm alive is because she joined the donor registry," stated Jessica.

Continue on Page 18

Single Line Stories

-Special thanks to Mohammad A. Rattu, PharmD for updating our website! Check it out at: www.rhochistj.org/RhoChiPost-

- Congratulations to all the students who matched with a Residency Program! -

- Follow us on Twitter @ RhoChiPost and on Facebook: FB.com/RhoChiPost -

A Brave New World for Lipid Management

By: Amrita Singh, PharmD Candidate c/o 2015

Last November, the American College of Cardiology and the American Heart Association released new lipid guidelines, which will transform the way we manage our patients with hyperlipidemia. Earlier, lipid management was based on the ATP-III guidelines, which emphasized the use of several lipid-lowering medications to reach target levels of low-density lipoprotein (LDL). The new guidelines, announced on November 12th, have thrown out the classic numerical goals such as LDL less than 100 mg/dL and focus on treating patients based on their risk for a cardiovascular event.¹

According to writers of the new lipid guidelines, no evidence from clinical trials exists to support treating patients to a specific target.² In fact, "trials showed that lowering LDL-C and raising high density lipoprotein cholesterol did not necessarily lower risk."³ They also noted that using LDL targets may lead to over treating patients with non-statin therapies.² While targeting specific LDL levels is no longer essential, the levels will still be important in assessing the benefit of a particular dose of statin.²

The new guidelines still maintain the importance of healthy lifestyle modifications such heart-healthy diets, decreased sodium intake, and increased physical activity.⁴ When it comes to lipid management, the guidelines recognize four groups of individuals most likely to benefit from statin therapy: patients with atherosclerotic cardiovascular disease, patients with LDL levels of 190 mg/dL or higher, patients 40 to 75 years old with type 2 diabetes, and patients 40 to 75 years old with an estimated 10-year risk of cardiovascular disease of 7.5% or higher.⁴ The 10-year risk is based on a global risk assessment tool created by the same individuals who developed the new lipid guidelines, and can be accessed through the American Heart Association at my.americanheart.org/cvriskcalculator. The risk cal-

culator evaluates the risk for an individual's first cardiovascular event as well as stroke. Factors contributing to risk calculation include sex, age, race, cholesterol levels, blood pressure, diabetes, and smoking.

According to the new guidelines, in patients with atherosclerotic cardiovascular disease who have no contraindications or adverse events due to statins, high-intensity statin therapy should be started to achieve a minimum of 50% reduction in LDL cholesterol. High-intensity statin therapy includes rosuvastatin 20 to 40 mg or atorvastatin 80 mg. At a lower treatment level, moderate intensity statins include atorvastatin 10 mg, rosuvastatin 10 mg, simvastatin 20 to 40 mg, pravastatin 40 mg, or lovastatin 40 mg.²

In patients with LDL levels of 190 mg/dL or higher, a high-intensity statin should be initiated. Patients 40 to 75 years old with type 2 diabetes should be started on a moderate-intensity statin to achieve a 30% to 49% reduction in LDL cholesterol. If the patient's 10-year risk is higher than 7.5%, using a high-intensity statin could be considered. In patients 40 to 75 years old with an estimated 10-year risk of cardiovascular disease of 7.5% or higher, a moderate or high-intensity statin is recommended.²

Recommendations for statin therapy in these four defined groups were based on randomized, controlled clinical trials which showed that benefits achieved from statin treatment outweighed risks of adverse events.² For those patients who do not meet the criteria of the four defined groups, the guidelines recommend evaluating other factors which may justify initiating statin therapy. These factors include a family history of cardiovascular disease, C-reactive protein levels above 2 mg/L, evidence of calcification on a coronary artery, and an ankle-brachial index less than 0.9.²

After implementing the new guidelines, it is esti-

The new guidelines, announced on November 12th, have thrown out the classic numerical goals such as LDL less than 100 mg/dL and focus on treating patients based on their risk for a cardiovascular event.

NEWS

ated that the percentage of adults on statin therapy will double from 15% to 30%.⁴ Patients initiated on statin therapy should have their lipid profiles evaluated 4 to 12 weeks after the initiation of treatment to ensure the statin is achieving its appropriate level of reduction in LDL cholesterol. Serum creatinine kinase levels should also be monitored in patients at high risk for statin-induced myopathy, and if patients are experiencing muscle pain, a different low-dose statin may be more appropriate.²

As expected, the departure from LDL cholesterol targets has met a vast deal of controversy. Many critics argue that target cholesterol levels were common goals not dictators of therapy.¹ In addition, the global risk assessment tool used to determine the likelihood of a CV event is derived from data obtained through cohort studies which some claim to be outdated.² In addition, the new guidelines give no recommendation for managing those patients who

cannot tolerate statin therapy.¹ Treating to goal cholesterol levels had been the mainstay in lipid control and departure from these set values leaves greater room for clinical judgment.

SOURCES:

1. Page, MR. Pharmacy Times. The New Lipid Guidelines: An In-Depth Look. <http://www.pharmacytimes.com/news/The-New-Lipid-Guidelines-An-In-Depth-Look>. Accessed Feb 3, 2014.
2. Vega, CP. Medscape PHARMACISTS. ACC, AHA Update Guidelines for Treatment of High Cholesterol CME/CE. <http://www.medscape.org/viewarticle/813659>. Accessed Feb 3, 2014.
3. Krumholz HM, Hines HH. Target cardiovascular risk rather than cholesterol concentration. BMJ. 2013; 347:f7110. doi: <http://dx.doi.org/10.1136/bmj.f7110>. Accessed Feb 3, 2014.
4. Mitka, Mike. Groups Release New, Updated Guidelines to Reduce Heart Disease Risk Factors. JAMA. 2013; 310(24):2602-4. doi:10.1001/jama.2013.284084. Accessed Feb 3, 2014.

Methadone Associated Arrhythmias on the Rise

By: Jenny Park, PharmD Candidate c/o 2015

Methadone maintenance therapy is prescribed for opioid dependency. Many HIV patients who were former injection drug abusers rely on methadone maintenance. Although there is limited data, research suggests lamivudine, ritonavir, and zidovudine to be the most common concomitant drugs in methadone associated torsades and prolonged QT interval.¹ Over the past decade, there have been many reports of methadone-associated arrhythmias. An arrhythmia is an irregular heartbeat where the heart may beat too fast, too slow, or even too early.² When electrical impulses that contract the heart are disrupted, arrhythmias can occur. The risk of cardiac events can be correlated with QT prolongation, which is associated with voltage-gated potassium channels. "A QT interval, is the length of time required for the heart to repolarize following the onset of depolarization".³

According to the U.S. Food and Drug Administration Adverse Event Reporting System, from November 1997 to June 2011, there were 1646 cases of ventricular arrhythmias or cardiac arrest and 379 cases of QT prolongation or torsade de pointes associated with methadone.⁴ Deaths occurred in 42%

of these cardiac events and 11% of these fatalities were related to torsade de pointes.⁴

In an effort to reduce arrhythmia risk, the center for substance abuse (CSAT) issued five specific recommendations.⁵ First, clinicians should inform patients about the risk of arrhythmias when prescribing methadone. Second, clinicians should probe their patients' medical histories for heart disease, arrhythmia or syncope. Third, patients should be screened for corrected QT (QTc) interval if the methadone dose is greater than 100 mg per day or if patients have unexplained seizures. A corrected QT interval estimates the interval at a heart rate of 60bpm and will allow QT values to be compared at different heart rates. If patients have a QT interval between 450 – 500 milliseconds, the risks and benefits of methadone treatment should be discussed. If the interval is more than 500 milliseconds, the dose should be decreased or discontinued. Lastly, physicians should be aware of drug interactions that prolong the QT interval.⁵

Although research is limited and findings may not be definite, these associated deaths should be some-

thing that all prescribers be aware of. The new recommendations should be taken seriously in regards to patients taking methadone concomitantly. Hopefully, with such close monitoring, patients will get the treatment they need with fewer cardiac deaths.

SOURCES:

1. AIDs International Society. Methadone Arrhythmia rising in the US. And ART may pose a higher risk. July 11, 2013. International AIDS society website. <<http://www.iasociety.org/Article.aspx?elementId=15315>> Accessed November 14, 2013
2. Medical News Today. What is arrhythmia? What causes arrhythmia? Medical news today website. September 9, 2009. Available at <<http://www.medicalnewstoday.com/articles/8887.php>>

Accessed January 18, 2014

3. US Pharmacist. Drug-Induced QT prolongation. US Pharmacist website. February 20, 2007. Available at <http://www.uspharmacist.com/content/d/featured_articles/c/10396/> Accessed October 31, 2013.
4. PubMed. Trends in reporting methadone associated cardiac arrhythmias. 1997-2011; an analysis of registry data. PubMed website. May 21, 2013. Available at <<http://www.ncbi.nlm.nih.gov/pubmed/23689766>> Accessed October 31, 2013.
5. Medscape. Safety Guidelines Issued for prescribing methadone. Medscape Website. January 27, 2009. Available at <<http://www.medscape.org/viewarticle/584826>> Accessed October 31, 2013

Prior Experience and the Growth of the Biosimilars Market

By: Davidta Brown, Senior Staff Editor

In 21st century medicine, pharmaceuticals have come to include compounds derived through novel and complex methods. Some of the most recent innovations have been in the form of biologics, therapeutic compounds produced through biological processes.¹ Biologics are derived from living cell lines which may be bacterial, yeast, animal, or human in nature.² The applications of these treatments are wide in range; biologics have been employed as therapies for rheumatoid arthritis, multiple sclerosis, and various forms of cancer.³ Since insulin became the first biologic to be approved by the FDA in 1982, a wave of biologically derived molecules entered the pharmaceutical market through the 1980s and 1990s.¹ The coming years mark the expiration of the patents of many of these innovative biologics, creating a manufacturing opportunity that is familiar in several respects, and original in many others.

With the patent expiration of the original biologics comes the creation of a market for other manufacturers to produce similar therapies, just as the expiration of the patent on a brand name drug provides an opportunity for other companies to offer a generic. The term "biosimilar" implies a relationship between two substances that is analogous to that

between a branded and a generic product. However, unlike generic drugs, biosimilars are not produced through chemical synthesis, and so it is virtually impossible to ensure a compound that is structurally identical to the original biologic.¹ The impending flood of competition in the biologics market, as well as an international push for more affordable healthcare, brings into focus these and other qualities that distinguish biosimilars from generics and makes their increased prevalence a unique prospect.²

Potential manufacturers of biosimilars may face production difficulties due to the distinctness of biological compounds. Much like during the introduction of the first biologics, manufacturers must invest significantly in the analysis of these large and complex molecules. The original biologic and the resulting biosimilar must both be characterized structurally, which is no easy feat.¹ This and all the other stages of the biosimilar production process contribute to steep manufacturing costs that may effectively drive pharmaceutical companies away from the industry.³

For years, the structural dissimilarity between biosimilars and their original compounds has presented difficulties in establishing FDA approval protocols. The traditional Abbreviated New Drug Application is

for generics that are essentially indistinguishable from the brand name drug in active ingredient and clinical behavior. With the exception of the few biosimilars that have been approved under the Hatch-Waxman Act, as generics similar but not identical to their reference product, biosimilars have had no abridged pathway for approval, a significant roadblock for any potential manufacturer.¹

Fairly recent legislation, specifically an amendment to the Public Health Service Act, intends to address this regulatory conflict by creating an abbreviated pathway for the approval of biosimilars, as long as manufacturers provide data proving that the originator drug and the biosimilar have no clinically significant differences in safety, purity, or potency.⁴ The revisions, which were included in the Affordable Care Act of 2010 and which are referred to as the Biologics Price Competition and Innovation Act (BPCI Act), share an objective with the Hatch-Waxman Act by welcoming competition in the biosimilar market.⁴ Of clinical relevance, the legislation also establishes standards for the classification of "similarity" between follow-on biologic and original. According to the guidelines, in order for a compound to be deemed biosimilar, it must not possess any biological or clinical differences from its original counterpart, although its chemical features may vary.²

The lack of structural homogeneity between biosimilar and biologic also presents a conflict in naming new biosimilars, since the International Nonproprietary Name system currently used for generics could lead to the same name being used for structurally distinct compounds.³ A universal naming system for biosimilars is critical to Phase IV post-marketing studies of biosimilars. Slight differences in the structures of related biosimilars may translate to notable clinical differences, and the exact compound given to each patient must be recorded.³ The debate as to the most appropriate system for naming follow-on biologics is ongoing.

Of specific concern to clinicians is the therapeutic interchangeability of the biosimilar compound and the original biologic. Physicians, community pharmacists, and Pharmacy & Therapeutics (P & T) committees need to be assured that exchanging one biosimilar for another will not compromise safety or efficacy.¹ The BPCI Act also seeks to address this concern by establishing high standards for therapeutically

interchangeable biosimilars. Manufacturers of the interchangeable treatments must prove that their compounds can produce the same results as the reference biologic in a randomized sample of the population, and that there is little to no risk in switching between original and biosimilar.⁴

While many favor the increased manufacture of biosimilars to bring more treatment options to the market and lower healthcare costs, opposition to the idea has been presented by several biotechnology manufacturers and their lobbyists.⁵ These voices of dissent are often the producers of the original biologics soon to go off patent, for whom the increased competition means loss of business and reduced recovery of the investments made in research and development. As the major source of innovation in the pharmaceutical industry, whether of biologics or traditional drugs, it is important that manufacturers find sufficient incentive to invest in new treatments. The patent system helps to ensure that innovators are rewarded for their creativity and effort. However, some biologic manufacturers have sought to defend their interests with legislature as well. In order to maintain some market exclusivity, they apply their influence to state government in the hopes of creating laws that would conflict with the provisions of the ACA.⁵ Only time can tell how these lobbying efforts will affect the growing biosimilar industry.

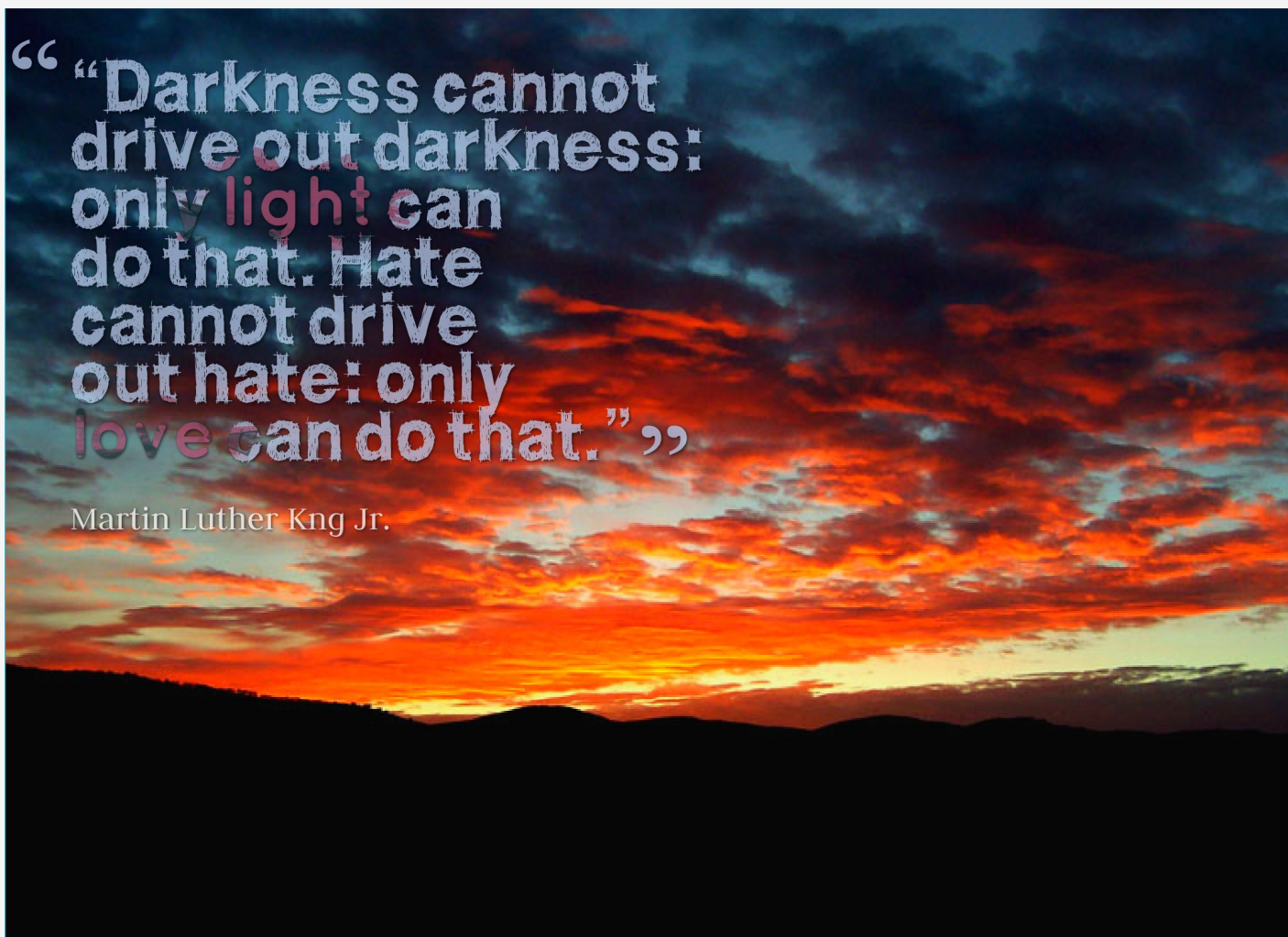
As is to be expected with the introduction of any new treatment, the most overarching apprehensions to the flood of biosimilars soon to enter the healthcare field are related to their unfamiliarity. Physicians and pharmacists could reasonably be skeptical of their clinical efficacy in comparison to biologics, and patients comfortable with their medications may be hesitant to switch to something with a different name or from another manufacturer, even if it's more cost effective. However, in most respects, increased competition in the field of pharmaceuticals is not a wholly foreign experience. The same decision-making principles that have been applied by pharmacists, physicians, and P & T committees when exchanging generics for branded drugs could also be used for biosimilars and biologics. If anything, the new change can be welcomed as an opportunity to see if the lessons of the past can be applied to the future and if innovation finds a warmer reception the second time around.

SOURCES:

1. Gebhart F. Preparing for biosimilars. Drug Topics: Voice of the Pharmacist. Available from: <http://drugtopics.modernmedicine.com/drug-topics/news/preparing-biosimilars>. Published July 2013. Accessed January 29, 2014.
2. Cai XY, Wake A, Gouty D. Analytical and bioanalytical assay challenges to support comparability studies for biosimilar drug development. *Bioanalysis*. 2013; 5:517-520
3. Farfan-Partet MI, Gerkens S, Lepage-Nefkens I, Vinck I, Hulstaert F. Are biosimilars the next tool to guarantee cost-containment for pharmaceutical expenditures? *Eur J Health Econ*. 2013. doi: 10.1007/s10198-013-0538-4
4. US Food and Drug Administration. Implementation of the Biologics Price Competition and Innovation Act of 2009. Available at: <http://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/ucm215089.htm>. Accessed January 30, 2014.
5. PCMA, NCPA blast biosimilars legislation. Drug Topics: Voice of the Pharmacist. Available from: <http://drugtopics.modernmedicine.com/drug-topics/news/user-defined-tags/biosimilars/pcma-ncpa-blast-biosimilars-legislation>. Published February 2013. Accessed January 30, 2014.

Quote of the Month

By Melissa Roy Co-Copy Editor (Graphics Focused)



The Status of Surveillance of Japanese Encephalitis in Asia

By: Sabrina Ahmed, PharmD Candidate c/o 2017

One recent stride towards combating worldwide infectious disease has been in the improved surveillance of Japanese encephalitis in Asia, predominantly in South and South-East Asia. This potentially deadly virus is transmitted to humans via mosquito bites. The Japanese encephalitis (JE) virus is the leading cause of encephalitis in Asia with about 67,900 cases occurring each year.¹ The virus's high prevalence in Asia is due to the abundance of flooded rice fields which can harbor large quantities of mosquitoes carrying the virus. While the most common hosts for JE are birds and pigs, humans can serve as hosts during periods of mosquito overpopulation. Most humans who contract the disease remain asymptomatic or experience mild symptoms. However, about 1 in 200 exhibit severe symptoms such as seizures, paralysis, high fever, and possible death concomitant with brain inflammation. The population affected by the virus is disproportionately young in age. Young children constitute the majority of the sufferers of JE due to their lack of immunity towards the virus, whereas older individuals are protected by their immunity attained from prior exposure.² Of the people who experience severe symptoms, as many as 20 to 30% may perish while 30% to 50% develop permanent neurological damage.³

There is currently no treatment for Japanese encephalitis but observation in the hospital setting is strongly recommended. Pain relieving and fever reducing medications can alleviate some of the symptoms but are ultimately not curative.⁴ So, preventive measures are particularly important. Modifying environments that mosquitoes carrying JE inhabit may serve as a viable option, depending on the methods employed. Typically, using mosquito nets and insect repellents is a relatively inexpensive and effective option to prevent infection. Conversely, chemical treatment of the rice fields, which act as breeding grounds for the mosquitoes, is costly and covers too large of an area to be a practical solution.² Health officials are still exploring for more effective alternatives.

The most integral and efficacious method for helping curb the spread of JE is vaccination. One

type of vaccine for Japanese encephalitis is a live-attenuated formulation that is cheap but only available in China rendering it ineffective for worldwide use. There has been notable success, however, with the use of an inactivated version of the virus.² There are certain drawbacks to the vaccine, namely its cost and the need for two booster shots. Japanese encephalitis is most common in rural areas but the inhabitants of these areas may not be able to afford the vaccine or have enough access to health services to receive a vaccination.¹ In regard to travelers, the Advisory Committee on Immunization Practices recommends that travelers receive the vaccine if they plan to spend more than one month in an endemic region (can include rural and high-risk areas) during transmission season. The vaccine is not recommended for travelers staying for short periods of time in an urban area or when it is not primary transmission season.⁵

In spite of the shortcomings of the Japanese encephalitis vaccine, tremendous efforts have been made on a worldwide scale to increase immunization rates and to survey the disease. Indeed, these efforts have been moderately successful according to reports from the CDC in an article published in the Morbidity and Mortality Weekly Report (MMWR). These reports stated that public awareness regarding the severity of Japanese encephalitis and its status as a deadly disease has increased. In addition, data collection on the use of the vaccines in affected regions help evaluate the efficacy of these immunizations.¹ Limited resources and inadequate knowledge about disease burden prevent third world nations from fully utilizing the aforementioned preventive measures. Cooperation is critical; wealthier nations can provide support to poor endemic regions through "surveillance and vaccine introduction."³

Out of the 24 countries at risk, 18 practice some form of surveillance. The extent of this surveillance, however, varies - from being conducted at a national level in some countries to only in high-risk areas in others. Furthermore, only 11 of these nations have an immunization program, seven of which employ either

an immunization program that spans the entire nation or all areas at risk, while the remaining four only immunize a fraction of at risk areas.³ As vaccination is the most effective preventive measure to control the spread of JE, it is imperative that more nations implement immunization programs. 10,426 cases of JE were reported from 19 of the 24 countries that had citizens who were at risk of contracting the disease. 95% of the cases originated in India and China; the remaining 150 cases were spread among the other countries.¹

The ramifications of this subpar surveillance are significant because even after immunization programs are implemented, undetected disease transmissions can occur. The number of cases reported is particularly troubling as well because the number falls well below the 67,900 cases estimated by the WHO. These thousands of unreported cases allude to inadequate surveillance. In fact, out of five nations to report no new cases of JE, three of them did not have a surveillance program in place. The disease could still be spreading, but because of the lack of surveillance programs in these nations, proper action to combat JE cannot take place. Consequently, the main concern for these nations according to the CDC is that "further progress toward [Japanese encephalitis] control requires increased awareness of disease burden at the national and regional levels...and international support for surveillance and vaccine introduction in countries with limited resources."³ Advances in surveillance, more efficient usage of data to aid in immunizations, and a more thorough understanding of this virus have definitely improved the prospects of preventing disease transmission, but there are many obstacles left.³ Until we can properly educate the masses about the value of vaccines against Japanese encephalitis as well as fund vaccination programs in poorer countries, the JE will con-

tinue to threaten South and South-Eastern Asia.

SOURCES:

1. Japanese encephalitis: improved surveillance, immunization in Asia. American Pharmacists Association Web site. <http://www.pharmacist.com/japanese-encephalitis-improved-surveillance-immunization-asia>. Updated August 23, 2013. Accessed January 24, 2014.
2. Water sanitation health, water-related diseases: Japanese encephalitis. World Health Organization Web site. http://www.who.int/water_sanitation_health/diseases/encephalitis/en/. Accessed January 25, 2014.
3. Japanese encephalitis surveillance and immunization – Asia and Western Pacific, 2012. Centers for Disease Control and Prevention Web site. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6233a2.htm>. Updated August 23, 2013. Accessed January 25, 2014.
4. Symptoms and treatment of Japanese encephalitis. Centers for Disease Control and Prevention Web site. <http://www.cdc.gov/japaneseencephalitis/symptoms/>. Updated November 12, 2012. Accessed January 25, 2014.
5. Hills S, Weber I, Fischer M. Infectious diseases related to travel: Japanese encephalitis. In: CDC Health Information for International Travel 2014. New York: Oxford University Press; 2014. <http://wwwnc.cdc.gov/travel/yellowbook/2014/chapter-3-infectious-diseases-related-to-travel/japanese-encephalitis>. Updated September 18, 2013. Accessed January 31, 2014.

Has your article been published in an issue of the Rho Chi Post?

If so, congratulations!

Here is a suggested format for citing / referencing your work:

[Author(s)]. [Article Title]. Rho Chi Post. [Year and Month Published]. [Volume]([Issue]):[Pages].

ASHP 48th Midyear Clinical Meeting

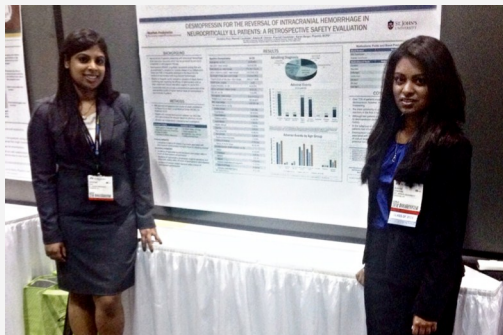
By: Aleena Cherian, Co-Copy Editor [Graphics-focused]

From December 8th to 12th 2013, over 20,000 student pharmacists, residents, fellows, pharmacy technicians, new practitioners, and seasoned professionals all gathered in Orlando, Florida for the 48th Midyear Clinical Meeting and Exhibition, hosted by the American Society of Health-Systems Pharmacists (ASHP). The schedules were packed with a number of networking events, educational activities, the Clinical Skills Competition, annual Residency Showcase, and various exhibits and poster sessions. PharmD Candidates from St. John's University represented the College of Pharmacy and Health Sciences at the Clinical Skills Competition, as well as at the student poster session, where they displayed the results of various research projects, surveys, and clinical studies that were successfully completed over the past year.

Students and first-time attendees of the conference also were entertained by the humorous and inspiring Ron Culberson, MSW, CSP, a former social worker and Director of Quality Services for a hos-

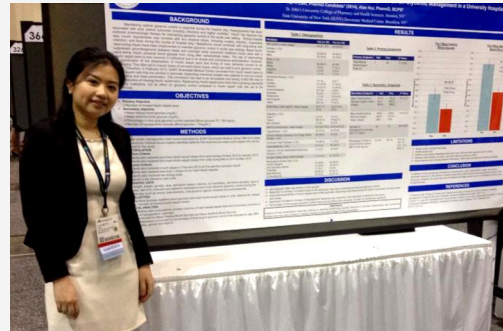
pice organization in Washington, DC. Mr. Culberson shared words of advice for achieving success while dealing with the pressures of the work environment, which uses the principle "Do it Well, Make it Fun." We learned that one of the keys to being an excellent worker and leader is to show up and focus on doing an exceptional job, while finding ways to make even the most menial tasks enjoyable.

The words of wisdom from the speakers, the valuable information from the educational programming, especially those geared towards students transitioning into becoming health care professionals, and the various networking opportunities are only a small glimpse at what makes attending the ASHP Midyear Clinical Meeting such a worthwhile experience for students at any stage in their pharmacy education. I strongly encourage students, especially those in their final professional year, to consider attending the next meeting, which will be held in Anaheim, California from December 7-11th, 2014.



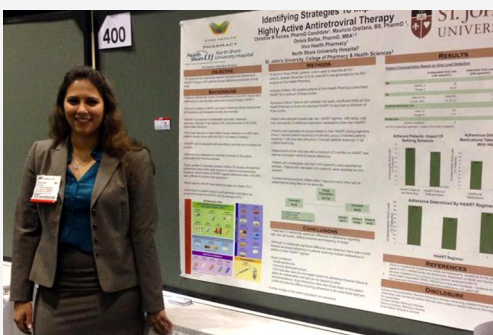
Christine Paul, Aleena Cherian

Desmopressin (DDAVP) for the reversal of intracranial bleed in neurocritically ill patients: a retrospective safety analysis



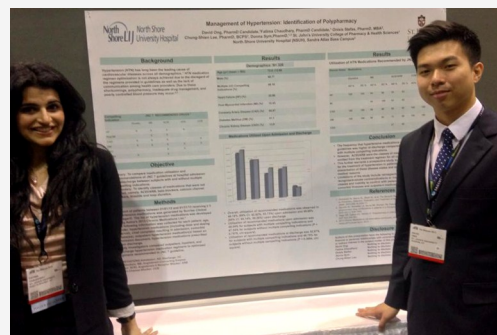
Ka Yi (Betty) Lam

Comparative study of premeal administration of insulin aspart vial and insulin aspart pen on glycemic management in a university hospital



Christine Holuka

Identifying strategies to improve highly active antiretroviral therapy (HAART)



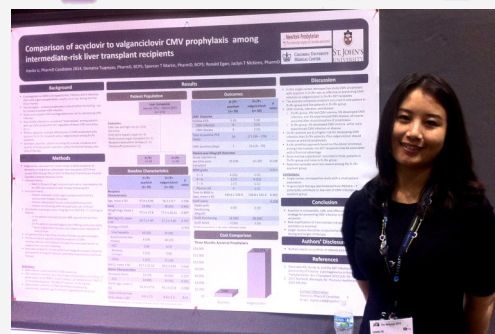
David Ong, Fatima Chaudhary

Management of Hypertension: Identification of Polypharmacy



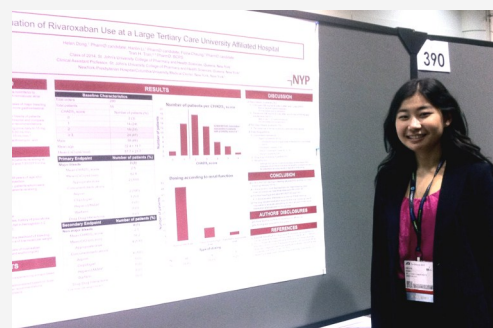
Fiona Cheung

Safety of high dose intravenous continuous infusion of midazolam in refractory status epilepticus



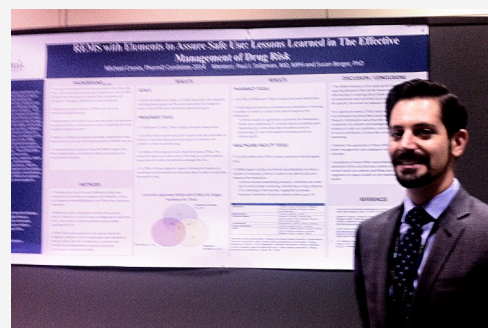
Hanlin Li

Comparison of acyclovir and valganciclovir in intermediate-risk liver transplant recipients for the prevention of cytomegalovirus infection



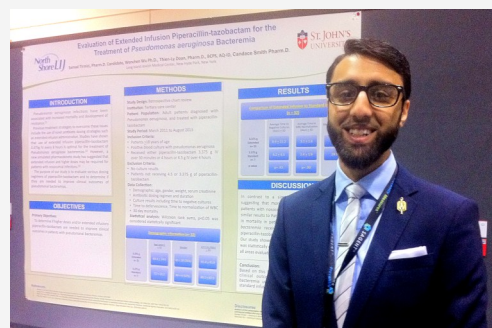
Helen Dong (Hanlin Li and Fiona Cheung)

Evaluation of rivaroxaban use at a large tertiary care university affiliated hospital



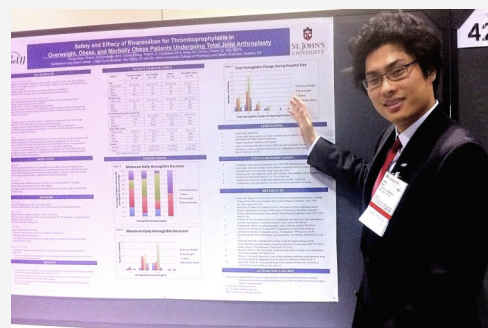
Michael Cronin

Risk Evaluation and Mitigation Strategies with Elements to Assure Safe Use: Lessons Learned in the Effective Management of Drug Risk



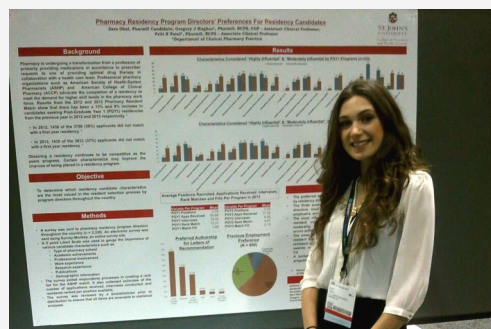
Samad Tirmizi

Evaluation of extended infusion piperacillin-tazobactam for treatment of Pseudomonas aeruginosa bacteremia.



Yining Shao

Safety and efficacy of rivaroxaban for venous thromboembolism prophylaxis in overweight, obese, and morbidly obese patients undergoing total joint arthroplasty



Zera Obol

Pharmacy residency program directors preferences for residency candidates

Stephen Argiro <i>Not photographed</i>	Oral Vancomycin Dosing in the Treatment of Clostridium Difficile Infection: A Retrospective Comparison of Doses
Cecilia Zhang <i>Not photographed</i>	Incidence of toxic megacolon in pediatric patients with inflammatory bowel disease treated with opioids during an acute exacerbation

Photographs published for this article are approved by and are the sole property of Aleena Cherian and the Rho Chi Post.

Going International

By: Hayeon Na, Co-Copy Editor (Content-focused)

On Tuesday, February 4th, the New Jersey Pharmacist Association (NJPhA) and Dr. Maria Leibfried hosted a seminar for international pharmacy students at St. John's University. The seminar was held to provide information to international students, especially for those who are here as F-1 students, about their options when it comes to working in the United States as interns and as pharmacists after graduation.

Before we get into the event, I would like to talk about what makes someone an international student, and the options that they have as a pharmacy major, both before and after graduation. What follows is the information I have gathered through my experience in the U.S., and more specifically at St. John's University.

International students are those who are in the U.S. from other countries to study under student visas granted by the U.S. government. There are different kinds of student visas, but F-1 is the one required to attend a University or college¹ and was the most common (if not exclusive) among those who attended the event. The U.S. government requires that all applicants ages 14-79 undergo an interview process to prove their eligibility for student visas.¹ In order to qualify, F-1 candidates must overcome the "presumption of being an intending immigrant," to show the U.S. government that they do not intend to make a living in the U.S., and that their primary intention is to complete their studies here.² If the applicant does not meet these requirements, their visa application is denied.

Once in the U.S., the student must continue to attend school and abide by the rules of their F-1 status in order for U.S. Citizenship and Immigration Services (USCIS) to allow the student's lawful presence in the U.S. Not intending to seek employment solely for financial gains is one of these requirements the student must meet. So when it comes to seeking employment, there are only two real off-campus options available to international students: "CPT" or "OPT."³

"Curricular practical training" (CPT) is an employment "relate[d] to the major and the experience must be part of the program of study."³ Currently, this option is not available for pharmacy majors at St. John's University. The second option, "optional practical training" (OPT), is an employment related to the student's major or course of study, and is limited to a duration of 1-year of full time, during school breaks or after completion of their program (over 20 hours per week), or 2-years of part time (under 20 hours per week), during their studies under the F-1 visa.³ In other words, students in the 6-year PharmD program can only be employed for the limited duration out-

lined by the USCIS. When they finish their studies and use up the OPT time, they must leave the U.S. unless their non-immigrant status changes.

Using the OPT after graduation is the only way to seek out potential employers after graduation as licensed professionals. Because of the limited time that they are given, international students must make the choice to use the time either before or after the completion of studies. For example, I started using my part-time OPT in my first professional year. This means that I have stop working by this year (my 3rd professional year) if I cannot find an alternative route. This also means that when I graduate, I need to leave the country immediately, unless I change my status or pursue further studies. Taking this into consideration, using up the limited OPT time may not seem like the best option. But for those who want to find paid employment in the field to gain clinical experience outside of rotations during their studies, it may be the only lawful option. Many students hesitate to apply for OPT because of several reasons: (1) it costs \$380⁴, (2) there is only a limited amount of time for which they can work, (3) they must find a job in that time, and (4) it may take up to three months for the government to issue authorization to work. This means that they are gambling on their chances of getting employed in time, or are simply hoping their potential employer is holding the spot for them for three months if they have already been offered positions. By no means am I endorsing the idea of international students staying in the U.S. after graduation; however, our subject of study and clinical experience are so intertwined that those who cannot work as interns are automatically at a disadvantage, both in school and in the "real world."

Because clinical experience is so important in the field of pharmacy, students feel the pressure to seek employment during their studies, especially after they receive their intern permits. Instead of simply focusing on school and not experiencing the "real world," interns should spend time around patients and medications, which may be the most effective way to retain and apply information acquired in classes. And frankly, as pharmacy students, we all know the information—whether it is pharmacology, medicinal chemistry, pathology, or therapeutics—can seem like it is coming at us at the speed of light. In other words, if we are not working, we have to try harder to remember a majority of the information and have to teach ourselves to apply the information in an effective way by the time we graduate.

Now, back to the main event. Around 5:30 PM in St. Albert's Hall room G21, a small but interested group of

students gathered to attend the seminar. Some were board members of the NJPhA, most were international students, and I'm sure some were there just for the pizza and soft drinks that Director Krista Gard, Director of International Student and Scholar Services Office (ISSSO), so generously provided. I was invited to talk about my experience as a student who was using her OPT hours before graduation to seek off-campus employment in the field of pharmacy.

After the attendees ate, Ms. Gard gave a detailed presentation on OPT with a focus on pharmacy. She welcomed questions and urged students to make appointments at the ISSSO to discuss their options. Then, I shared my experience with the audience, Dr. Leibfried thanked everyone for attending, and the students went their merry ways or stayed around to ask questions.

This was the first and much needed seminar at St. John's University that was focused on international pharmacy students. Under the guidance of the wonderful faculty who can help in so many ways, international pharmacy students can aspire to become well-informed individuals to reach their full potential in school and in their field of career, despite their non-citizen and non-immigrant status. There is a need for a more open and directed set of advice for international pharmacy students. Even

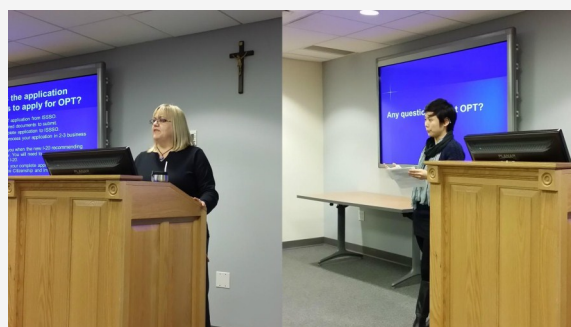
though many of the students will not stay around in the U.S. after graduation, facilitating their employment as interns will help them become better pharmacists, wherever they practice. In gathering and discussing options for international pharmacy students, we have taken an important step in a new direction to improve patient care globally.

SOURCES:

1. Bureau of Consular Affairs-U.S. Department of State. Student visa. U.S. visas. <http://travel.state.gov/content/visas/english/study-exchange/student.html>. Accessed February 6th, 2014.
2. Bureau of Consular Affairs-U.S. Department of State. Visa Denials. U.S. visas. <http://travel.state.gov/content/visas/english/general/denials.html>. Accessed February 6th, 2014.
3. U.S. Immigration and Customs Enforcement. Practical Training. U.S. Immigration and Customs Enforcement. <http://www.ice.gov/sevis/practical-training/>. Accessed February 6th, 2014.
4. U.S. Department of Homeland Security. I-765, Application for Employment Authorization. U.S. Department of Homeland Security. <http://www.uscis.gov/i-765>. Accessed February 6th, 2014.



From Left to Right: Dr. Maria Leibfried, Donia Abdelazeem, David Said, Rana Ferdous, Director Krista Gard



Left: Director Krista Gard; Right: Hayeon Na

Photographs published for this article are approved by and are the sole property of Hayeon Na and the Rho Chi Post.



ST. JOHN'S
UNIVERSITY

33rd Annual GRASP Conference 2014

JUNE 5-7, 2014, QUEENS, NY

Theme:

Future of Pharmaceutical Sciences: Industrial Shift from the West

Call for Abstracts

Share your work with experts and peers in the form of poster/podia presentations.

Abstract submission deadline: March 15, 2014

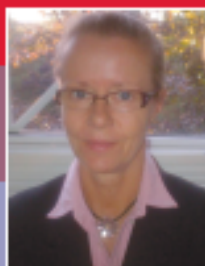
Visit: stjohns.edu/grasp2014.



FEATURED SPEAKERS:



ACADEMIA
Abu Sarajuddin, Ph.D.
Professor of Industrial Pharmacy
St. John's University



INDUSTRY
Annette Bak, Ph.D.
Director
Merck Research Laboratories



INDUSTRY
Yatinendra Joshi, Ph.D.
Vice President
Teva Pharmaceuticals



FDA
Lawrence X. Yu, Ph.D.
Deputy Director (Acting)
Office of Pharmaceutical Science,
Food and Drug Administration



ENTREPRENEURSHIP
Clifford S. Minkes, Ph.D.
Founder and President
BioInights Inc.

Prizes:

1st place

Podia presentation: \$1,000
Poster presentation: \$500

2nd place:

Podia presentation: \$500
Poster presentation: \$250

For more information visit:

stjohns.edu/grasp2014, or email; grasp2014@stjohns.edu.

Psychiatric Prescriptions in the Fight Against Juvenile Diabetes

By: Davidta Brown, Senior Staff Editor

CLINICAL

In August 2013, the results of a yearlong safety study were published in the *Journal of American Medical Association (JAMA) Psychiatry*.¹ The study, which followed the health status of about 43,000 youths aged 6 to 24, confirmed and built upon a previously noted trend in adults: that the use of second generation (also known as “atypical”) antipsychotics is related to an increased risk of type 2 diabetes.¹ While the use of antipsychotics has been shown to correlate with a twofold increase in the risk of type 2 diabetes in adults, it correlates with a threefold risk increase in the youths under study.¹ The use of antipsychotics in children and young adults has increased dramatically in recent decades. The estimated number of office-based treatments for US youths that involved antipsychotics has jumped from 201,000 in 1993 to 1,224,000 in 2002, making the results of this study rather significant.^{2,3} Because antidepressants and antipsychotics are known to have outcomes in children that vary from those seen in adults, the effects of antipsychotics on pediatric type 2 diabetes are worthy of particular interest.¹

The pharmacoepidemiological data in this study were collected from children and young adults in the Tennessee Medicaid system who used antipsychotics for conditions such as bipolar disorder, ADHD, and other various mood disorders over the course of one year.⁴ It is important to note that each participant was being treated for a psychiatric condition for which options other than antipsychotic medications were available.¹

After a year, it was discovered that the individuals who had been treated with antipsychotics instead of matched sample treatments with antidepressants or anti-anxiety medication were three times more likely to develop type 2 diabetes. Risk increase was represented as a hazard ratio of 3.03, using the statistical analysis of 106 recent diagnoses of diabetes among patients during follow-up medical screenings.¹ Furthermore, the risk remained elevated for a full year after the discontinuation of the atypical antipsychotic medication therapy, with a hazard ratio of 2.57 during this time.¹ The risk also seemed to increase with long-term, cumulative doses; the hazard ratio was 3.42 for those receiving doses between 5

and 99 gram equivalents of chlorpromazine, and 5.43 for patients receiving 100g or more.¹ As mentioned, the subjects who had increases in the risk of developing type 2 diabetes had treatment options other than antipsychotics for their conditions, so in their cases, reducing the risk could be as simple as changing their prescription.

While this information seems to suggest the need for limited use or even a contraindication of antipsychotics in pediatric patients, it is important to remember that the study only demonstrates correlation, not causation. The relationship between antipsychotic medications and increased risk of type 2 diabetes is not yet fully understood, but it is possible that the increase in risk is a side effect of the weight gain that is also typically associated with psychiatric treatments.⁵

For now, healthcare providers are advised to closely monitor the weight and glucose levels of young adults and children taking atypical antipsychotics, and to suggest treatment alternatives whenever possible.⁴ The rising prevalence of obesity and type 2 diabetes among pediatric patients has been a source of national debate for some time. With further study, the careful selection of psychiatric medications to avoid increasing the risk of type 2 diabetes may prove to be another weapon in the arsenal against this pervasive foe.

SOURCES:

1. Bobo WV, Cooper WO, Stein C, et al. Antipsychotics and the Risk of Type 2 Diabetes Mellitus in Children and Youth. *JAMA Psychiatry*. 2013;70(10):1067-1075.doi:10.1001/jamapsychiatry.2013.2053.
2. Olfson M, Blanco C, Liu L, et al. National Trends in the Outpatient Treatment of Children and Adolescents With Antipsychotic Drugs. *Arch Gen Psychiatry*. 2006;63(6):679-685. doi: 10.1001/archpsyc.63.6.679. Accessed Feb 23, 2014.
3. Crystal S, Olfson M, Huang C, et al. Broadened Use of Atypical Antipsychotics: Safety, Effectiveness, and Policy Challenges. *Health Aff*. 2009; 28(5):w770-w781. doi: 10.1377/hlthaff.28.5.w770. Accessed Feb 23, 2014.
4. Thompson D. Antipsychotic Drugs May Triple Kids' Diabetes Risk, Study Suggests. *Health Day*. 2013 Aug [cited 2013 Aug 30]. Available from: <http://www.consumer.healthday.com/kids-health-information-23/child-development-news-124/antipsychotic-drugs-may-raise-diabetes-risk-in-kids-study-says-679459.html>
5. Stigler KA, Potenza MN, Posey DJ, et al. Weight gain associated with atypical antipsychotic use in children and adolescents: prevalence, clinical relevance, and management [abstract]. *Paediatr Drugs*. 2004;6

RHO CHI POST CLINICAL CORNER

Pharmacologic Agents Used in Dementia

By: Aleena Cherian Co-Copy Editor (Graphics-Focused) & Beatrisa Popovitz, Staff Editor

Agent/Formulations	Pharmacology & Clinical Points	Dose		Risks/Toxicities
		INITIAL	MAINTENANCE (Titration)	
Donepezil (Aricept®) Oral tablet (5mg, 10mg, 23mg) Orally disintegrating tablet (5mg, 10mg)	Centrally active, reversible, and noncompetitive acetylcholinesterase inhibitor (increases levels of acetylcholine in CNS). Long half-life & highly protein bound. Indicated for mild, moderate, or severe dementia of Alzheimer's type	5 mg orally at bedtime (with or without food)	Mild to moderate: May increase to 10mg qd after 4-6weeks, Moderate to severe: may increase further to 23mg qd after >/ 3months	Generally well tolerated Diarrhea, nausea, vomiting are most common (usually mild) dizziness, sedation, hypertension, loss of appetite
Galantamine (Razadyne®) Formerly <i>Reminyl®</i> before 2005 Oral tablet (4mg, 8mg, 12mg) Extended release oral capsule (8mg, 16mg, 24mg) Oral solution (4mg/mL)	Reversible, competitive acetylcholinesterase inhibitor that also modulates nicotinic acetylcholine receptors Indicated for mild-moderate dementia in Alzheimer's disease	IR : 4mg twice daily with meals ER: 8mg once daily with meals	IR: 8-12 mg twice a day with meals ER: 16-24 once daily with meals moderate renal or hepatic impairment: 16mg/day (increase by 8mg/day every 4 weeks) **If treatment is interrupted for more than 3 days, restart at the lowest dose and increase to the current dose**	GI: nausea, vomiting, diarrhea, anorexia CNS: dizziness Use is not recommended in patients with severe renal or liver dysfunction
Rivastigmine (Exelon®) Transdermal patch (4.6mg/24h, 9.5mg/24h, 13.3mg/24h) Oral capsule (1.5mg, 3mg, 4.5mg, 6mg) Oral solution (2mg/mL)	Reversible inhibition of acetylcholinesterase and butyrylcholinesterase Indicated for mild-moderate dementia associated with Alzheimer's or Parkinson's disease, and transdermal patch is also indicated in severe Alzheimer's disease	ORAL : 1.5 mg twice a day with meals TRANSDERMAL: 4.6 mg/day	ORAL: 3-6 mg twice a day with meals (increase by 1.5 mg twice a day every 2 weeks) TRANSDERMAL: 9.5 mg/day -13.3 mg/day -renal or hepatic impairment: 4.6mg/day (Titrate the patch if tolerated every 4 weeks) **If treatment is interrupted for longer than several days, restart the treatment at the lowest dose and titrate up again**	GI: nausea, vomiting, dyspepsia, anorexia and weight loss CNS : dizziness, fatigue, syncope Extrapyrarnidal effects (i.e. tremor)

Reviewed by: Dr. T Jodlowski and Dr. J Beizer

Agent/Formulations	Pharmacology & Clinical Points	Dose		Risks/Toxicities
		INITIAL	MAINTENANCE (Titration)	
Memantine (Namenda™) Tablet (5mg, 10mg) **NOTE: Forest Pharmaceuticals, Inc. will discontinue this IR formulation later this year. Namenda™ Titration Pak (28x 5mg tablets, 21x10 mg tablets) Oral solution (2mg/mL) Once daily ER capsule Namenda XR™ 7mg, 14mg, 21 mg, 28mg	Inhibit glutamate exocytotoxicity: uncompetitive antagonist of N-methyl-D-aspartate (NMDA) type of glutamate receptor located ubiquitously throughout the brain Indicated for moderate-severe dementia in Alzheimer's disease	IR: 5 mg once a day (with or without food) ER: 7mg once daily (with or without food)	IR: 10 mg twice a day (with or without food) Severe renal impairment (CrCl 5-29 mL/min) IR: initial 5mg qd, may be titrated up to 5mg bi if tolerated after at least 1 week of therapy ER: target dose 14mg/day (Increase by 5mg/day every week) ER: 28mg once daily [max dosing] (with or without food) (Increase by 7mg/day every week) Cr Cl 5-29ml/min (severe renal impairment); target dose 14mg	Most common side effects are headache, diarrhea, dizziness, hypertension

Overview of Dementia Assessments

MMSE

Mini Mental State Exam

Measures	Cognitive function
Design	11 item test to examine orientation (10 points) retention and recall (6 points), language abilities, attention /calculation (5 points) and visuospatial ability
Rating	30 point scale <23 – cognitive impairment

ADAS-Cog

Alzheimer's Disease Assessment Scale-Cognitive Subscale

Measures	Cognitive function
Design	11 item score range based on: memory and new learning language,) and constructional/ideational praxis)

MoCA

Montreal Cognitive Assessment

Measures	Cognitive function (considered more sensitive to subtle cognitive impairments and better than MMSE for mild dementia)
Design	Assess orientation, delayed word recall, language, attention, calculation, abstraction, as well as tasks including clock-drawing test and trail test
Rating	30 point scale

CIBIS

Measures	Global function
Design	Semi structured interview with four major categories of evaluation: General, mental/cognitive state, behavior and ADL (assessed by use of Probes to record observations in detail)
Rating	7 point scale to grade severity 0 (not assessed) to 7 (most extremely ill)

Reviewed by: Dr. T Jodlowski and Dr. J Beizer

Overview of Dementia Assessments

BADLS

Measures	Functional impairment
Design	20 item questionnaire that measures ability to carry out daily activities
Rating	0 (totally independent) to 20 (functionally impaired)

CIBIC+

Clinicians Interview Based Impression of Change

Measures	Change in global function
Design	Semi structured interview with four major categories of evaluation: General, mental/cognitive state, behavior and ADL (facilitate assessment of change)
Rating	7 point scale 0 (very much improved) 4 (no change) 7 (marked worsening)

SIB

Measures	Cognitive ability
Design	40 item scale with 6 major subscales (attention, language, visuospatial ability, memory, construction) to evaluate cognitive ability in severely demented patients via simple one step commands
Rating	100 point scale

SOURCES:

- Aricept (donepezil hydrochloride) [package insert]. Teaneck, NJ: Eisai Co, Ltd.; 2006.
- Exelon (rivastigmine tartrate) [package insert]. East Hanover, NJ: Novartis Pharmaceuticals; 2006.
- Exelon (rivastigmine) Patch [package insert]. East Hanover, NJ: Novartis Pharmaceutical; Aug 2012
- Namenda (memantine hydrochloride) [package insert]. St. Louis, MO: Forest Laboratories; 2007
- Namenda XR (memantine hydrochloride extended release capsules). NDA 22525. Forest Pharmaceuticals, Inc. REVI [06/2010]
- Lexi-Drugs Online. Hudson (OH : Lexi-Comp, Inc. 2013)
- Guthrie EW. The Use of Memantine (Namenda) In Patients With Mild-to-Moderate Alzheimer's Disease. Pharmacist's Letter. 2004 (20:200202)
- Farlow MR, Salloway S, Tariot PN, et al. Effectiveness and tolerability of high-dose (23mg/d) versus standard-dose (10mg/d) donepezil in moderate to severe alzheimer's disease: A 24 week, randomized, double-blind study. *Clinical Therapeutics*. 2012 July. 32:1234-1251.
- Rainer M, Mucke HA, Kruger-Rainer C. et al. Cognitive relapse after discontinuation of drug therapy in Alzheimer's disease: cholinesterase inhibitors versus nootropics. *J Neural Transm*. 2001. 108:1327-1333
- Howard R, et al. Donepezil and memantine for moderate-to-severe Alzheimer's disease. *N Eng J Med*. 2012. Mar 8:366 (10):8
- Sheehan B. Assessment scales in dementia. *Ther Adv Neurol Disord*. 2012; 5(6):349-358
- Nasreddine Z., Phillips N., Bédirian V. et al. The Montreal Cognitive Assessment (MoCA): a brief screening tool for mild cognitive impairment. *J Am Geriatr Soc* 2005; 53: 695-699.
- Schmitt FA, Ashford W, Ernesto C et al. The severe impairment battery: concurrent validity and the assessment of longitudinal change in Alzheimer's disease. The Alzheimer's Disease Cooperative Study. *Alzheimer Dis Assoc Disord*. 1997;11 Suppl 2:S51-6.

Reviewed by: Dr. T Jodlowski and Dr. J Beizer

The Importance of Organ Donation Continued

This experience opened Jessica's eyes to the critical shortage of organs in the United States. She remarked, "There were so many friends that I made in the hospital who died before they got a heart in time or by the time they finally received one they were too sick to sustain it." Jessica quickly became active in the field of organ and tissue donation, and today she continues to increase awareness as the Program Manager of Transplant Education, Outreach, & Advocacy at New York Presbyterian Hospital/Weill Cornell, one of the largest transplant centers in the country, which performs over 200 transplants a year.

In the United States, a name is added to the transplant waiting list every 10 minutes with an average of 18 people dying each day waiting for a transplant. And while 90% of Americans say they support organ donation, only 30% know how to become a donor.¹ While this lack of awareness contributes to the organ and tissue shortage, many people also choose not to register as donors due to myths about organ donation that are perpetuated in pop culture and the media. A frequent misconception is that doctors will not try as hard to save the life of an organ donor. In reality, these patients receive the best possible medical care. As an educator on organ donation, Jessica explains that "the team treating a person coming into the hospital is entirely separate from the transplant team and their number one priority is to save your life." One donor can save up to eight lives through organ donation and save or improve the lives of up to 50 other recipients through tissue and eye donation.¹ Ultimately as Jessica says, "organ donation is about life, not death."

The Pharmacy Perspective

By: James Schurr, PharmD Candidate c/o 2014

Student Pharmacists have the opportunity to make a significant difference in patients' lives as a member of the transplant team. While on rotation at New York Presbyterian Hospital, I had the good fortune of taking an elective rotation in renal transplantation at Weill-Cornell Medical Center. One of the responsibilities of the rotation was counseling pa-

tients on their new medication regimens after their transplant surgery. I always tell people that this experience changed my life forever. This was a group of patients who were given a new lease on life after suffering for years with chronic kidney disorders from such debilitating conditions as diabetes mellitus, polycystic kidney disease, and renal cell carcinoma. They were motivated to be active in their care, and they carried themselves with a sense of optimism and humbled gratitude I have never seen before. Gone were the days of dialysis and replacing them was a better tomorrow.

What this rotation taught me went far beyond the intricacies and pharmacology of their medications, but instead the powerful and lasting effects we have on others' lives. The generosity of the organ donors changed these individuals' lives forever. In fact, one of the most profound impacts on me as a student was how, after finishing counseling patients on their medications, they would wish me luck in my journey as a pharmacy student. After going through one of the most life-altering experiences they would ever know, they were so grateful for their gift, that they wanted to give too, if only in good wishes.

It is from this experience that I saw how organ donation transforms peoples' lives. Thanks to the rotation, I don't see organ donors and patients as numbers or statistics, but as the lives that are touched, the hope in the smiles of those who received life, and the generosity of those who gave it. It may not be the easiest subject to talk about and can be uncomfortable for some, but after seeing this world I implore every single person to find it within themselves to become an organ donor.

Transplant Healthcare Provider Perspective

By: Jennifer McDermott, PharmD, BCPS of NewYork-Presbyterian Hospital

As a transplant clinical pharmacist caring for kidney and pancreas transplant patients, I have the joy and honor of being a part of the transplant patient's journey from struggling with chronic disease and often facing both complications and their own mortality from illness to living a full life after organ transplan-

BACK TO COVER

tation. Being a part of this transformation is life changing, not only to the patient but also to me. It is unfortunate that several myths exist about organ donation since the need for organ donors has never been greater. Over 120,000 people are waiting for an organ transplant, and, each year, thousands of people die while waiting for a transplant because of lack of donors. By being an organ donor, you can give as many as eight people a second chance at life. Before I became involved in transplants, the question of being an organ donor only came up when I was getting or renewing my drivers' license. But, limited information on the implications was provided. I now see the overwhelming benefit that organ donation has on a daily basis, and not only have I registered as an organ donor, I have also ensured that my family members are as well. Register to be an organ donor today. Help make a difference by giving the Gift of Life!

SOURCE

1. Understanding donation. Donate Life America web site. <http://donatelife.net/understanding-donation/>. October 2013. Accessed March 25, 2014.

How to Register as an Organ Donor

Register Online at www.savelifesny.org (New York residents) www.donatelifenet.net (out-of-state residents)

Stop by the **Organ Donor Drive** on April 14th, from 8am-4pm, D'Angelo Center, Main Floor

Sign up on your driver's license at the **DMV**



Jennifer Mcdermott, PharmD, BCPS (second left) and Jessica Melore (far right) raise awareness with other members of Donate Life!

***Photographs published for this article are approved by and are the sole property of the authors and the Rho Chi Post.

Dietary Supplements and Their Potential Dangers

By: Fatema Elias, Staff Writer

With the New Year and everyone committing to their New Year resolutions, more and more patients are coming into the pharmacy asking for recommendations, particularly for weight loss dietary supplements. I hesitate to recommend an over-the-counter dietary supplement for weight loss. However, we as pharmacists and pharmacy students have to realize that patients come to us for advice, and if we tell them that we cannot recommend anything, we should at least give them some guidance. We cannot simply turn them away by saying that there aren't products to use, because we may be leading them to other options that can be harmful.

The other day, a patient came into the pharmacy asking me to help her find a particular dietary

supplement. Even after I explained that most dietary supplements have ingredients that do not show advantageous results and that some products have unknown mechanisms of action, the patient was undeterred, and ended up purchasing the 'Acai Berry 14-day Fat Burn Cleanse' product.

This brings to light an underlying issue. Patients are getting their healthcare information often from unprofessional and unreliable sources. Even with the risk of unknown side effects, patients are jumping into taking new supplements just to 'test it out.' Although the Food and Drug Administration (FDA) has identified dietary supplements that contain ingredients that could be harmful to users, it cannot test all supplements on the market that can contain poten-

tially harmful ingredients. Still there are enforcement actions by the FDA and consumer advisories for products that are tainted which cover a fraction of the products that may potentially harm the buyer.¹

In October 1994, the Dietary Supplement Health and Education Act (DSHEA) was signed into law.² Previously, dietary supplements were subject to the same regulatory requirements as other foods were. This new law, which amended the Federal Food, Drug, and Cosmetic Act, created new regulations for the safety and labeling of dietary supplements. Currently, manufacturers of dietary supplements determine whether the products they distribute are safe for the public, unlike the FDA approval process that drugs go through. However, when a manufacturer wants to market something that is known as a 'new dietary ingredient,' it requires a pre-market review for safety data.^{3, 4}

A 'dietary ingredient' and a 'new dietary ingredient' are components of dietary supplements. In order for an ingredient of a dietary supplement to be a 'dietary ingredient,' it must be one or any combination of the following substances: a vitamin, a mineral, an herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total dietary intake (e.g., enzymes or tissues from organs or glands), or a concentrate, metabolite, constituent or extract.² A 'new dietary ingredient' is one that meets the above definition for a 'dietary ingredient' and was not sold in the U.S. in a dietary supplement before October 15, 1994.² The FDA published comprehensive regulations for current good manufacturing practices for those who manufacture, package, or hold dietary supplements. These regulations focus on practices that ensure the identity, purity, quality, strength and composition of dietary supplements.

Once a product is on the market, retailers and distributors must take responsibility for abiding by the FDA's regulations. The FDA publishes a list of products marketed as dietary supplements with hidden drugs and chemicals.⁴ Some of the recent ones were promoted for weight loss, but have been found in lab analysis to have tainted dietary supplements along with other approved prescription drug ingredients and their analogues that are potentially dangerous. For example, 'MAXILOSS Weight Advanced', 'Dream Body Slimming Capsule' and

'Celerite Slimming Capsule' contained the hidden chemical sibutramine, and 'Magic Slim' contained the hidden chemicals sibutramine and phenolphthalein.⁵ Sibutramine has been associated with increased cardiovascular events and strokes, and the products were consequently removed from market and banned by FDA.⁵

Companies that sell dietary supplements play an important role in preventing tainted products from reaching consumers. Manufacturers have the legal responsibility to ensure that their products are not mislabeled and that their advertising does not misinform consumers. Anyone who sells or distributes products that do not follow these guidelines is "subject to criminal liability—misdemeanors and felonies, seizure of products, injunction of the responsible party/company, and disgorgement of profits and restitution."⁶ In the past decade, the FDA has become increasingly active in pursuing criminal convictions for companies selling tainted supplements.⁶

There are some things that we as consumers, pharmacists, and pharmacy students can do to help the FDA better regulate dietary supplements. In order to keep safe supplements available on the market and to keep potentially dangerous ones away, the FDA relies on the voluntary reporting of adverse events. Reports can be made even if you are unsure of whether it was the product alone that caused the problem. FDA uses the data to maintain safety surveillance of FDA-regulated dietary supplements.⁷

So should you stop taking your daily diet pills? Not necessarily. Be cognizant of what you are buying and be wary of adverse effects. Ask yourself "is it too good to be true?" Some things to look out for when searching the web for dietary supplements is to check who operates the site, what the purpose of the site is, what the source of the information is, if there are reliable references, if the information is current, and if the email solicitations they send are reliable. Think twice about chasing the latest headline, check your assumptions, and contact the manufacturer for more information about the product you are purchasing if you have any doubts. Also, be open to reporting any side effects that may be related to supplement use without hesitation. This can help you protect yourself and also protect consumers everywhere just like you.

The table below illustrates when a New Dietary Ingredient notification is required and whether the supplement is governed by the NDI standard.

Definition of New Dietary Ingredient (NDI), Requirement for NDI Notification and Applicability of NDI Adulteration Standard ⁴			
	New Dietary Ingredient (NDI)	NDI notification required?	NDI adulteration standard applies?
A dietary ingredient that was marketed in the U.S. before October 15, 1994	No	No	No
A dietary ingredient that was NOT marketed in the U.S. before October 15, 1994 AND was present in the food supply as an article used for food which has	Yes	See a) or b)	Yes
a) not been chemically altered	Yes	No	Yes
b) been chemically altered	Yes	Yes	Yes
A dietary ingredient that was NOT marketed in the U.S. before October 15, 1994 AND was NOT present in the food supply as an article used for food.	Yes	Yes	Yes

SOURCES:

1. Food and Drug Administration. Medication Health Fraud-Tainted Weight Loss Products. U.S. Food and Drug Administration. <http://www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/MedicationHealthFraud/ucm234592.htm>. Updated November 30, 2010. Accessed January 08, 2014.
2. Food and Drug Administration. What is FDA's roles in regulating dietary supplements versus the manufacturer's responsibility for marketing them? U.S. Food and Drug Administration. http://www.fda.gov/Food/DietarySupplements/QADietarySupplements/default.htm#FDA_role. Updated November 30, 2009. Accessed January 22, 2014.
3. Food and Drug Administration. Dietary Supplements – New Dietary Ingredients in Dietary Supplements – background for Industry. U.S. Food and Drug Administration. http://www.fda.gov/food/dietarysupplements/ucm109764.htm#what_info. Updated March 16, 2009. Accessed January 28, 2014.

4. Food and Drug Administration. Draft Guidance for Industry: Dietary Supplements: New Dietary Ingredient. U.S. Food and Drug Administration. <http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/dietarysupplements/ucm257563.htm>. Published July 01, 2011. Updated August 19, 2013. Accessed January 08, 2014.
5. Food and Drug Administration. Tainted Supplements_CDIER. U.S. Food and Drug Administration. http://www.accessdata.fda.gov/scripts/sda/sdNavigation.cfm?sd=tainted_supplements_cder. Updated January 08, 2014. Accessed January 08, 2014.
6. Food and Drug Administration. Tainted Dietary Supplements and Foods: Responsibilities of Retailers and Distributors. U.S. Food and Drug Administration. <http://www.fda.gov/downloads/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/MedicationHealthFraud/UCM230993.pdf>. Updated October 2010. Accessed January 08, 2014.
7. Food and Drug Administration. Reporting Serious Problems to FDA - OTC Products and Dietary Supplements. U.S. Food and

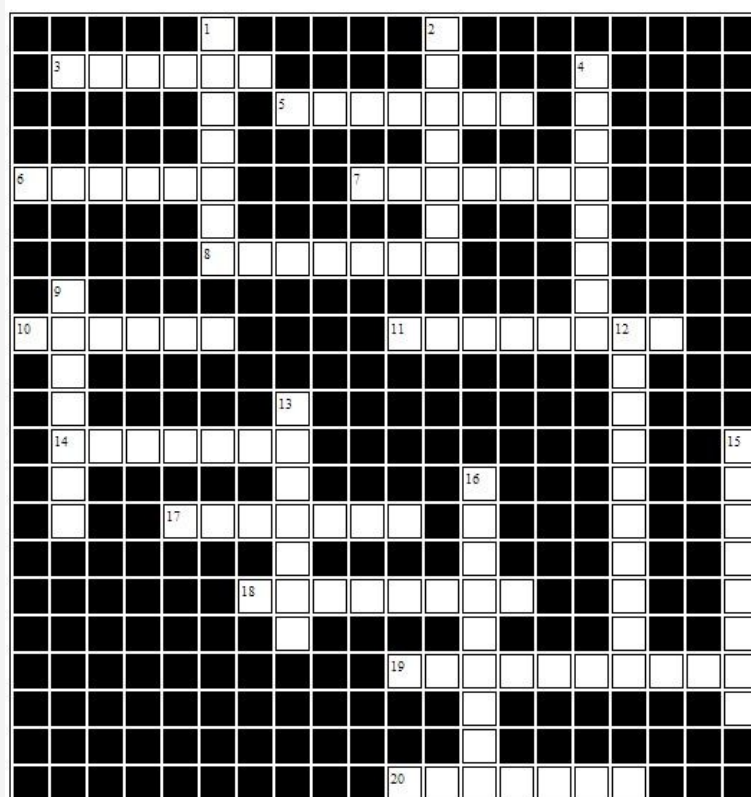
RHO CHI POST

Are You Smarter than a 6th Year?

Crossword Puzzle: Drug Top 200 Challenge

By: Tamara Yunusova, Senior Staff Editor

How well do you know the Top 200? For each generic name listed below, find the corresponding brand name in the puzzle. Note: This puzzle contains brand names only. Good luck!



Across

3. Tolterodine
5. Topiramate
6. Buspirone
7. Doxazosin
8. Losartan + HCTZ
11. Meclizine
14. Niacin
17. Eszopiclone
18. Diltilazem
19. Nitrofurantoin
20. Sitagliptin

Down

1. Acyclovir
2. Mirtazapine
4. Divalproex
9. Lisdexamfetamine
12. Cheritussin
13. Propanolol
15. Buprenorphine
16. Bupropion

Answers



By Sherine Jaison
PharmD Candidate
Class of 2015

Many drugs
LOOK – ALIKE
OR
SOUND– ALIKE

causing them to be
easily mixed up in
practice.

Can **YOU** match these
facts with the correct
medication?

Answers

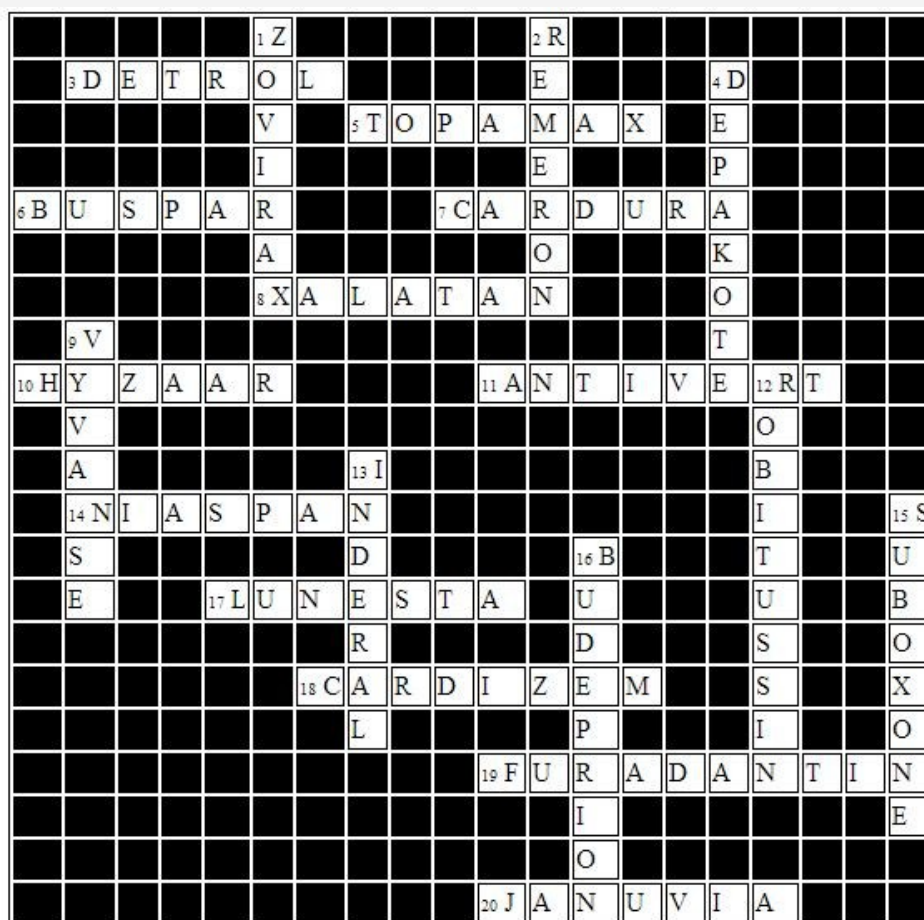
Matching Column: Look-Alike Sound-Alikes

- | | |
|---|------------------------|
| 1. The IM form of the drug is injected during the first five days of menstruation and is effective for three months | A. Maxzide |
| 2. A category X drug which is used to prevent NSAID induced gastric ulcers at a dose of 200mcg four times a day | B. Methyldopa |
| 3. A combination medication used to treat blood pressure that is contraindicated in patients with anuria, acute and chronic renal insufficiency, or significant renal impairment. | C. Metronidazole |
| 4. A beta 1 selective agent that can be used for heart failure | D. Montelukast |
| 5. A drug that is often is metabolized primarily by the liver and is often used to treat Clostridium difficile associated diarrhea. | E. Metformin |
| 6. Drug used to treat both asthma and allergic rhinitis and is dosed daily in the evening | F. Methylprednisolone |
| 7. An antidiabetic medication that can also be used to treat polycystic ovary syndrome | G. Medroxyprogesterone |
| 8. An alpha 2 adrenergic agonist that can be used to treat blood pressure during pregnancy | H. Misoprostol |
| 9. A drug that can cause lupus like syndrome which is dose every 8 hours to treat hyperthyroidism | I. Metoprolol |
| 10. The succinate salt of the drug is highly water soluble and has rapid effect and is used IV and IM while the acetate salt form is poorly soluble and is used IM for its sustained effect | J. Methimazole |

How Did You Do???

Answers to Word search & Look Alike and Sound Alike

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



Do you enjoy our puzzles?

Send us a suggestion for a brainteaser at

RhoChiPost@gmail.com

We will feature your work in our next issue!

RHO CHI POST: TEAM MEMBERS



@ Katharine Cimmino (5th Year, STJ; Editor-in-Chief)

I have always been an avid reader and writer. As a member of the Rho Chi Post I am able to merge my passions with the professionalism that comes with aspiring to be a healthcare provider. I am eager to be a part of a publication that promotes my interests and vocation.



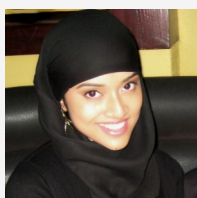
@ Bharat Kirthivasan (PhD Candidate, STJ; Co-Copy Editor [Content-Focused])

I am a doctoral candidate in Industrial Pharmacy researching nanoparticles for delivery to the brain. The only thing I enjoy more than reading a well-written piece of work is writing it. I am glad to work for the Rho Chi Post, and I encourage others to do the same.



@ Hayeon Na (5th Year, STJ; Co-Copy Editor [Content-Focused])

Hello! My name is Hayeon Na. I am a 2015 PharmD Candidate and one of the Copy Editors for the Rho Chi Post. I hope the information I present will be helpful, or at least interesting. If you have any comments regarding my contribution, feel free to contact me at any time!



@ Tasnima Nabi (4th Year, STJ; Co-Copy Editor [Content-Focused])

Writing has always been my greatest outlet for experience and knowledge, through which I hope to keep you engaged and informed. It is imperative to keep up with our changing profession and community, and I look forward to bringing pertinent information to the newsletter.



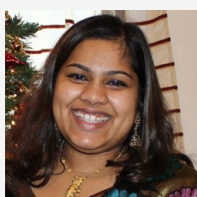
@ Erica Dimitropoulos (5th Year, STJ; Co-Copy Editor [Content-Focused])

As busy student pharmacists, we often fail to keep current with healthcare developments. My aim is to sort through the news and provide quick updates that are important to our profession. Feel free to contact me if there are any topics you would like to see covered in the next issue!



@ Aleena Cherian (6th Year, STJ; Co-Copy Editor [Graphics-Focused])

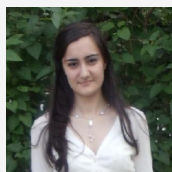
The Rho Chi Post has been a source of current information and great advice to students and professionals in this evolving profession. After years of experience in media and graphics-related work, it is now my privilege to be a part of this endeavor as a Co-Copy Editor. I hope you learn as much from future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



@ Melissa Roy (5th Year, STJ; Co-Copy Editor [Graphics-Focused])

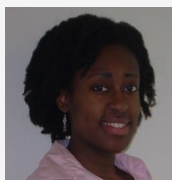
We as future healthcare professionals owe it to our patients and ourselves to become aware and current on the events affecting our profession. The Rho Chi Post is our way to learn new things and stay in touch with the pharmacy world, on- and off-campus. I have gained so much from reading previous publications and feel privileged to have the opportunity be a part of the team. Feel free to reach out to me with suggestions and comments.

RHO CHI POST: TEAM MEMBERS



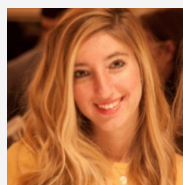
@ Tamara Yunusova (3rd Year, STJ; Senior Staff Editor)

My name is Tamara Yunusova, and I am a 3rd year Pharm D candidate at St. John's University. I enjoy articulating information in a captivating and insightful way. I hope to make this publication more informative, student-friendly, and innovative.



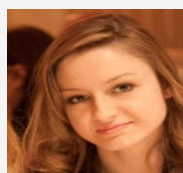
@Davidta Brown (3rd Year, STJ; Senior Staff Editor)

My two great loves are innovative science and quality writing, and the Rho Chi Post is an insightful combination of both. As an editor, I look forward to bringing relevant information and fresh perspectives to the student and faculty of St. John's University, as well as to making the Rho Chi Post a newsletter that offers something new to every reader.



@ Beatrisa Popovitz (5th Year, STJ; Staff Editor)

I am eager to relay current information on interesting topics making waves in the world of healthcare pertinent to the advancement of our profession. As student pharmacists, we are molding the future of our profession, and the Rho Chi Post facilitates the cultivation of a relationship (between students, faculty, and other members of the healthcare community) to share ideas and spread awareness of various issues.



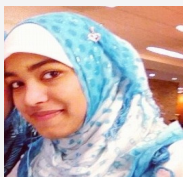
@ Ada Seldin (5th Year, STJ; Staff Editor)

I am thrilled to have become a new member of the Rho Chi Post team. I hope to further strengthen the goals of this newsletter and make a lasting contribution. It is important, as future pharmacists, to collaborate with our peers, as well as accomplished professionals in the field. Rho Chi Post provides a vehicle to voice our opinions and share relevant news.



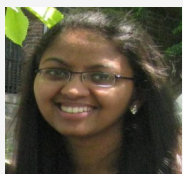
@ Sang Hyo Kim (2nd Year, STJ; Staff Editor)

Advancements of technology and developments of new medicines, prolonging the lifespan and improving the quality of life, have increased the geriatric population. In years to come, pharmaceutical industries and healthcare systems will persistently work to find solutions to changing demands and new problems of the society. Through the Rho Chi Post, I wish to learn, educate, and prepare myself and others for the future.



@ Fatema Elias (4th Year, STJ; Staff Writer)

I am honored to be a part of the Rho Chi Post team. In this age of technology and the continuously changing healthcare profession, I hope to engage like-minded students and professionals. Writing is something that I hold dear to my heart and I hope with this newsletter we can all stay well informed, interested, and educated.



@ Sherine Jaison (5th Year, STJ; Staff Writer)

I find the Rho Chi Post extremely informative and am eager to join the team. I hope my articles will enlighten you about the recent developments in the field of pharmacy and will help you to be a well-informed healthcare provider.



@ You!

We are always looking for creative and motivated students to join our team!

If you are interested in becoming an editor for the Rho Chi Post, please visit:

<http://rhochistj.org/RhoChiPost/EditorApplication>

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 is a monthly, electronic, student-operated, faculty-approved publication that 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 aims to become the most exciting and creative student-operated newsletter within St. John's University College of Pharmacy and Health Sciences. Our newsletter continues to be known for its relatable and useful content. Our editorial team continues to be known for its excellence and professionalism. The Rho Chi Post essentially sets the stage for the future of student-operated 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



Anthony, Tyler, Sara, Tasnima, Joshua, Fawad at the 2014 Induction Ceremony

President: **Tyler Valente**

Vice President: **Fawad Piracha**

Secretary: **Tasnima Nabi**

Treasurer: **Anthony Nania**

Historian: **Sara James**

Media Relations Coordinator **Joshua Bliss**

Faculty Advisor: **S. William Zito, PhD**

UPCOMING EVENTS

Apr 30-May 4: NYSCHP Annual Meeting
Saratoga Springs, New York

May 18: Commencement Day
St. John's University

May 17-20: NABP Annual Meeting
Phoenix, Arizona

Jun 15-19: DIA Annual Meeting
San Diego, California