

RHO_{Rx}CHI post

VOLUME 3, ISSUE 5

- 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

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Pharmacy Across the Border: An Interview with Sherif Guorgui, VP of Pharmacy at the Ontario Pharmacists Association

By: Sang Hyo Kim, Staff Editor

For the brand new year, we present an interview with Sherif Guorgui, the current Vice-President of Pharmacy at the Ontario Pharmacists Association and the former 2011-2012 President of the Ontario College of Pharmacists in Canada. Mr. Guorgui graduated in 1998 from the Faculty of Pharmacy at the University of Cairo and has more than 15 years of experience in pharmacy practice and operations. With his range of independent, franchise, corporate, regulatory and advocacy experience, Mr. Guorgui has strong awareness and comprehension of current and future pharmacy practice opportunities and challenges.

In his free time, Mr. Guorgui enjoys volunteering, watching soccer and spending time with his family.

We are very grateful for his time and hope his words on the aspects of the evolving pharmacy profession can be as informing and inspiring to the student body and faculty as it was to our team members.



Read the Full Interview on Page 16

Single Line Stories

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

- Congratulations to the new Rho Chi inductees and executive board! We thank them for their continuous support of the publication! -

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

**Interested in joining the Rho Chi Post?
Submit an article and letter of intent
by March 30th, 2014**

To rhochipost@gmail.com

View the application: <http://rhochistj.org/RhoChiPost/application/>

Below are some FAQ please email us for any other concerns!

Who can join the Rho Chi post? Do I have to be a member of Rho Chi?

You do not have to be a member of the Rho Chi Honor Society to contribute to the newsletter. You can be in any year of your Pharmacy education to join the Rho Chi Post. In fact, any member of the College of Pharmacy and Health Sciences can join our team!

What positions can I apply for to become a permanent member of the team?

1. Staff Writer: Commitment per issue: 2 contributions- either pieces that you write or pieces that you get from your friends
2. Staff Designer
 - Web based: Commitment per issue: Redesign and upkeep of the website
 - Graphic based: Commitment per issue: Any graphic designing that goes into creating the issue.
3. Staff Editor: Commitment per issue: 1 contribution, 2 articles edited
 - Note: for this position you need to show past editing experience.

What can I write about?

Feel free to write about any topic that interests you!

Check out our topic suggestions: <http://rhochistj.org/RhoChiPost/article-signup/>

Or Suggest a topic idea to us at: <http://rhochistj.org/RhoChiPost/suggest-articles/>

*Log in username is required

How long will it take to review my application?

After we accept your article for publication, we will respond to you via email within 7 days.

Besides the article requirement, how time consuming is being a member?

We only meet a few times each semester! Most of our communications are done online. Besides the meetings just meet your monthly requirements!

Are there any dues?

No dues are required to become a member!

If you don't want to commit to a permanent position, we welcome any submission at any time. There is no minimum or maximum to how many articles a person can submit!

Dengue Fever: Where Do We Go From Here?

By: Sherin Pathickal, PharmD Candidate c/o 2016

Dengue Fever, widely known as “break-bone fever,” is an illness that causes pain in the joints and muscles, and is often described by those infected as comparable to the feeling of breaking a bone.¹ It is spread by mosquitoes and has a painful array of symptomology such as headaches, severe joint pain, fever, and bleeding.¹ Although these symptoms are reminiscent of the flu, Dengue Fever causes a decrease in white-blood-cells, potentially leading to hemorrhagic fever, bleeding, shock, and death.² The World Health Organization has reported that nearly 390 million people are currently afflicted with Dengue Fever, and that nearly 40% of all people live in areas that put them at risk for this disease.² Furthermore, this disease has become an endemic in Nicaragua, has been seen for the first time in nearly 70 years in Western Australia, and has shown to be more deadly and severe now than in the last 20 years in Thailand.²

As the first occurrences of Dengue Fever were recently found on United States soil, this infection has become even more problematic. The first case in the U.S was seen in Houston, Texas. Since August 28th, nearly eight known cases were identified in Florida and were all found to be of local origin, indicating that the disease was not carried from abroad but is prevalent in the mosquito population of the United States.³ As of mid-November, cases have been seen throughout Texas and New York, signaling that these local infections are spreading more readily than previously believed.³ This disease has specifically been attributed to bites that were inflicted in the summer by the *Aedes aegypti* or Asian Tiger mosquito.¹ With large amounts of rainfall leading to standing water, warmer climates, and highly densely populated areas, it is no wonder that Dengue Fever is on the rise.³

Although not contagious from person to person, Dengue Fever can be quickly spread by mosquitoes. In addition to the more common symptoms listed previously, other characteristics of this disease include a maculopapular rash along the extremities and chest, eye pain, skin hypersensitivity, and GI complications.⁴ The severity of disease varies greatly, as patients can present with an uncomplicated fever, a

more serious hemorrhagic fever, or the most severe shock syndrome. There are no early warning signs that one may have the disease until the symptoms appear, which can typically take between 3 to 14 days following the initial infection. The disease itself usually lasts around 4 to 7 days.¹ Unfortunately, there are currently no approved vaccines or treatments for Dengue Fever.²

Despite the fact that no approved vaccines or major treatments currently exist to combat this invasive disease, it is imperative that the illness be diagnosed as quickly as possible so as to prevent any further damage to the patient's health. Once diagnosed, the CDC recommends hospitalization in order to adequately manage the illness.⁵ During a patient's stay in the hospital, the patient is treated with fluid replacement therapy in order to prevent dehydration, is told to rest, and is given analgesics to help with the pain associated with Dengue Fever.⁵ Due to the nature of the disease, it is advised that all patients be put on pain relievers containing only acetaminophen as opposed to aspirin or aspirin-like medications. This is because Dengue Fever has the potential to cause thrombocytopenia which increases a patient's propensity to bleed, a risk that would only be potentiated by anti-platelet drugs such as aspirin.⁵ Generally, with adequate rest, fluids, and pain management, the patient normally recovers.⁵

With very few treatment options available and with the threat of Dengue Fever on the rise, it is clear that the need to formulate and develop an approved vaccine is of utmost importance. The pharmaceutical manufacturing company, Sanofi, became one of the first to develop a potential vaccine in 2012. However, this vaccine proved to be only 30% effective during the first phase of the clinical trials.⁶ The question is then asked, why is this vaccine so hard to formulate? Dengue Fever has four major strains, and all four must be protected against in order for the vaccine to be truly effective.² If one becomes infected with a single strain of the disease, they are more susceptible to the other strains as well.⁷ The vaccine formulated by Sanofi has only shown to be protective against 3 of the 4 strains, indicating that

further research is needed, and it is hoped that by 2015 a more suitable vaccine will be formulated.²

Despite these setbacks, other groups and organizations throughout the world are working on developing an effective vaccine. In Colorado, a vaccine formulated by a team lead by Dr. Claire Huang entered Phase II of the clinical trials in 2012. The vaccine has shown to be effective against all four strains by allowing those who receive the vaccine to develop antibodies to the different types of Dengue Fever.⁷ In Baltimore, Anna Durbin and her team led a similar study, and results indicated that one particular combination of the vaccine known as TV003 was most effective at producing the desired immune response after just a single dose during Phase I trials.⁸ As can be seen from all three studies, further research and development is still needed, but with the proper resources and education the desired responses can soon be obtained. However, what remains certain is that we are facing a race against time as this disease becomes more deadly.

As researchers hurry to develop treatment options and a preventative vaccine, an organization known as Eliminate Dengue has been working towards reproducing mosquitoes that carry *Wolbachia* bacteria in Vietnam.² Although how the bacteria prevent mosquitoes from developing Dengue Fever is still unclear, this bacteria helps lower the risk of passing the disease on to humans.² These mosquitoes have been found to outlive and thrive over mosquitoes that have been infected with Dengue Fever, giving further strength to its use as a measure against the spread of the disease.²

As future healthcare professionals, it is vital that we recognize the signs and symptoms associated with mosquito-borne diseases, as many patients may not realize that they have been bitten or exposed. Because many of the initial symptoms are so closely related to those of the flu and other air borne viruses, Dengue Fever is often misdiagnosed which can lead to further complications for the patient.¹ As a result, it is imperative that the patient be treated as soon as possible. Furthermore, we should stress prevention methods during high-risk seasons by educating

people to wear skin covering clothing and using mosquito repellent.¹ In doing so, this disease can hopefully be eradicated within the United States before it becomes yet another endemic.

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The Increasing Roles of Pharmacists in Transplant Outcomes

By: Jenny Park, PharmD Candidate c/o 2015

Medication adherence is a big part of a patient's success in managing their health conditions. The Annals of Internal Medicine estimated that the cost of medication non-adherence may reach up to \$289 billion each year.¹ It is crucial for organ transplant patients to take powerful immunosuppressants to help overcome the body's response of the newly transplanted organ, but non-adherence remains to be a roadblock. According to Brett Sahli, PharmD, who is a manager at the pharmacy benefit manager (PBM) OptumRx, non-adherence rates among the transplant population are anywhere from 20% to 70%. This is problematic because "missing just a couple of days can cause rejection" of a transplanted organ.³

Many patients may stop taking their medications because of the undesirable side effects or because they don't realize the importance of taking their medications. OptumRx and United Health Care have been setting up specialty pharmacies that focus on patient education in addition to dispensing medications. "We've seen similar outcomes in improving medication adherence and clinical results and lowering medical service costs through our specialty pharmacy programs in oral oncology, rheumatoid arthritis, and multiple sclerosis," said lead author and vice president Suzanne Tschida, PharmD, BCPS.² Some PBMs have implemented a "total care management" in study models to address how the patient feels in addition to the traditional drug management. This holistic approach to therapy engages and empowers patients to manage their medications and take ownership. In addition, patients who actively manage their medications are more likely to make better health decisions.¹

OptumRx and United Health Care conducted a study that compares post transplant patient care in specialty pharmacies and in retail pharmacies. The difference between the two groups in outcome was statistically significant. The group receiving care from the specialty pharmacy was associated with lower transplant related medical costs, lower overall health care costs, and most importantly, higher medication adherence. There was a 30% reduction in transplant

related medical costs and a 13% reduction in overall health care costs for the duration of the study, and medical costs associated with using a specialty pharmacy were \$5960, whereas the costs for a retail pharmacy was \$8486.² Transplant specialty pharmacists provide people with adherence and clinical management programs. They also provide patients with education and counseling services. The goals, said Tschida, were to "reduce variability in pharmaceutical care, promote medication adherence and help members" manage side effects so they can continue taking immunosuppressants, resulting in "better outcomes and lower health care costs."³ Through patient education, specialty pharmacists can help patients optimize their therapy and reduce healthcare costs.

Many patients in general need help understanding their medication regimens and need to be given specific directions. Patients may have difficulty understanding how and when to take their medications, and what their medications interact with. For instance, many patients do not understand that taking their medication "twice a day" means every twelve hours, or why drinking milk with certain antibiotics is "bad". This leads to non-adherence which may prevent the treatment from reaching its maximum potential. With the help of pharmacists who specialize in their respective fields, patients will have improved health outcomes through close monitoring and education.

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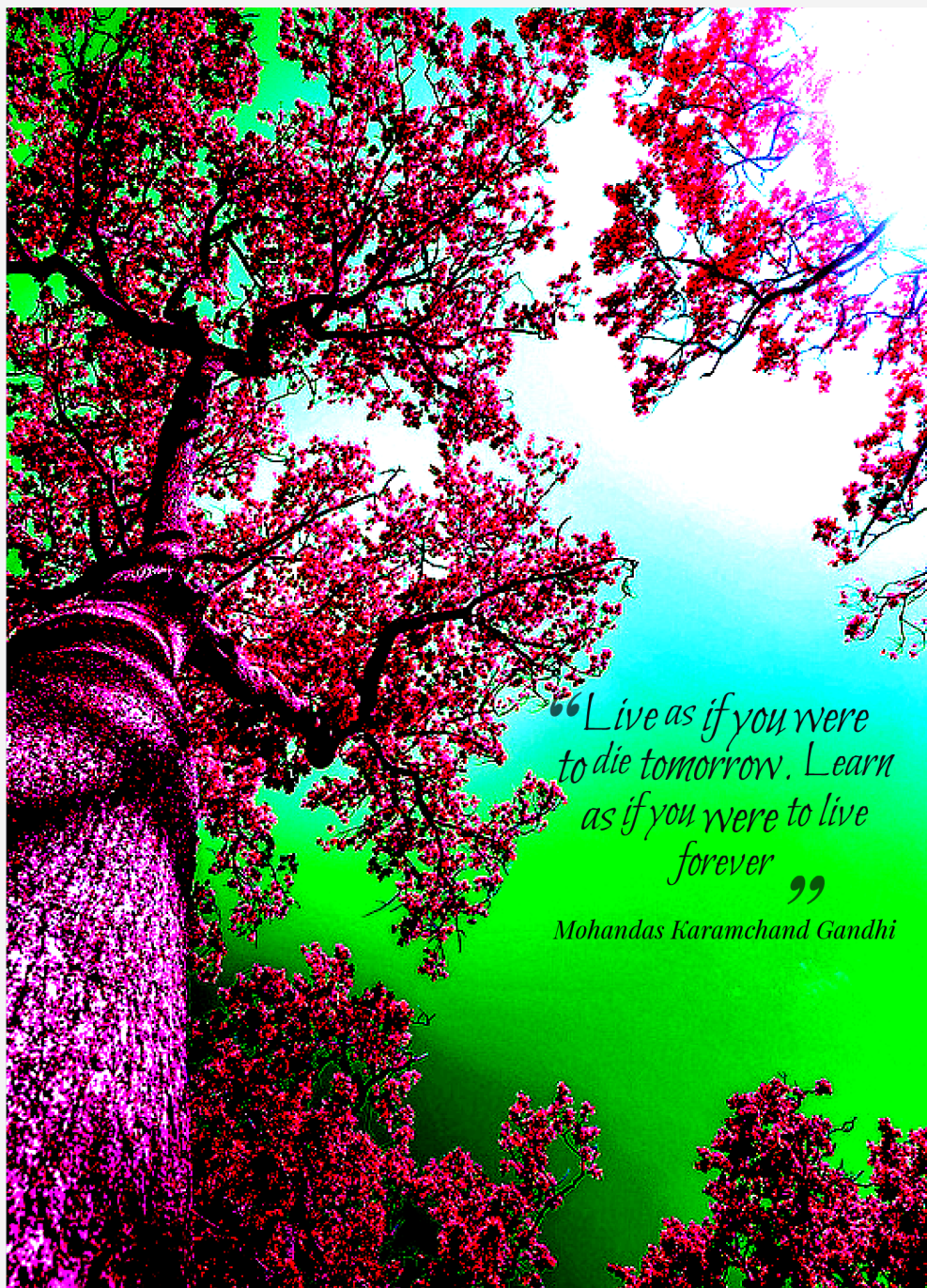
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Quote of the Month

By Melissa Roy Co-Copy Editor (Graphics Focused)



*“Live as if you were
to die tomorrow. Learn
as if you were to live
forever”*

Mohandas Karamchand Gandhi

A Walk To Remember

By: Caitie Stehling, PharmD Candidate c/o 2015

St. John's University is grounded in its Catholic, Vincentian, and Metropolitan mission. Students from all different colleges take pride in being able to give back to society. This year, Phi Lambda Sigma, the Pharmacy Leadership Society (PLS), participated in the Alzheimer's Walk at Corona Park in Queens.

As pharmacy students, it is wonderful to be able to get involved in an event that directly relates to our major. Alzheimer's Disease (AD) is commonly confused with dementia. In truth, it is one of the numerous forms of dementia. Dementia is the general term that describes when mental

health and ability declines enough that it impacts daily living. According to the Alzheimer's Association, AD is the most common form of dementia and it accounts for more than 60% of cases. It is known that Alzheimer's attacks the brain, yet specifics of the exact cause remain unclear.¹ AD also presents differently in each person. Common symptoms include disorientation, mood changes, unfounded suspicions about people they know (family, friends, caregivers, etc), and impacted mobility. The National Institute of Aging states that the most common symptom is the inability to retain newly learned information. It is a common misconception that forgetfulness is a normal part of the aging process. It is important for people to be aware that this could be a sign of Alzheimer's.²

PLS and St. John's University raised over \$400 dollars and awareness for this disease. PLS Presi-

dent, Sean Caltabiano, and Vice President, Caitie Stehling, headed the student team. Dr. Judith Beizer, a clinical faculty member who specializes in Geriatrics was also in attendance. Other faculty members who participated included Dr. Olga Hilas, Dr. Michelle Pisano, Dr. Nissa Mazzola, and Dr. Danielle Ezzo. Students, faculty, and the general public were able to select flowers to walk with to show different levels of support. Yellow flowers showed general

support for the cure, orange represented knowing someone suffering from Alzheimer's, purple was for those who had lost a family

member or friend with Alzheimer's, and blue was carried by those who were suffering from AD themselves. While the blue flowers were the least common, they inspired the most hope.

It was a pleasure to be able to participate in this event for the first time. PLS is looking forward to having it be one of our annual events.

Trivia Answer: Purple

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Trivia Question: What is the color of Alzheimer's Awareness?

EVENTS



Christine Holuka, Fatima Chaudhary, Zera Obol, David Gao, COdy Camardello, and the guy in the back is Ali Zaidi.

Dr. Judith Beizer, Dimitri Savva, Sean Caltabiano, Caitlin Stehling, and Christina Loccisano



Sean Caltabiano, Zera Obol, Dimitri Savva, Fatima Chaudhary, Christina Loccisano, and Caitlin Stehling

Look Into APhA-ASP Region 1&2 MRM

By: Tracey Li, PharmD Candidate c/o 2015

The American Pharmacists Association Academy of Student Pharmacists (APhA-ASP) holds the only meeting designed for student pharmacists, the Mid-year Regional Meeting (MRM). This year, the MRM took place in Washington, D.C. from November 1-3. In past years, the MRM has always been a gathering of the APhA-ASP chapters from one region but this year, Region 1&2 and Region 7&8 piloted joint meetings. As our St. John's University chapter belongs to Region 1, we were able to partake in one of the first combined MRMs.

The meeting began on Friday evening with a leadership workshop and continued with an energizing opening general session. The night concluded with the roaring twenties themed welcoming social and reception.

Saturday morning started off with coffee and workshops that engaged pharmacy students of all years. The pharmacy career panel educated students about the different options in pharmacy practice. An interview workshop prepared students applying for jobs, internships, and post-graduate programs. In the afternoon, students were given the opportunity to explore the MRM expo, speak with the

candidates running for regional offices, and attend more workshops. Concluding the full day of activities was the policy proposal forum, in which proposed resolutions from various schools in the region were presented and commented on.

On Sunday, the Generation Rx Workshop inspired students to think of new ideas for their own chapter's patient care projects. The weekend-long meeting concluded with the closing business session, where proposed and corrected resolutions were voted on, and regional officers were elected.

One of our first time MRM attendees, Danny Mathan, explained, "Attending MRM this past November was an amazing experience. It taught me so much about pharmacy and has made me eager to learn more and become more involved within our APhA chapter. I will definitely be attending MRM next year." APhA-ASP MRMs are an exciting environment to meet other student pharmacists and see firsthand how students can shape our profession. MRM 2013 served as a stepping-stone to APhA's Annual Meeting, which will be held in Orlando, Florida from March 28-31. We look forward to seeing you there!



Sara James, Jason Abraham, Daniel Mathan, Van Par, Amanda Zelinski, Tracey Li, Praneeta Nagraj



Daniel Mathan, Van Par, Praneeta Nagraj, Amanda Zelinski, Sara James, Tracey Li, Jason Abraham



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

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EVENTS

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Professor of Industrial Pharmacy
St. John's University



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



INDUSTRY
Yatinendra Joshi, Ph.D.
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Teva Pharmaceuticals



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Lawrence X. Yu, Ph.D.
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For more information visit:

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Long Term PPI Use Heightens Concern of Associated Health Consequences

By: Tamara Yunusova, Senior Staff Editor

Proton Pump Inhibitors (PPIs) are acid-reducing agents that have multiple uses in the treatment and prophylaxis of conditions such as peptic ulcer diseases, *H. Pylori* infection, Zollinger-Ellison syndrome, GERD, and NSAID gastroduodenal ulcers. Their versatility in treating a wide range of conditions, unparalleled efficacy over their Histamine-2-receptor antagonist (H2RA) predecessors, and limited side-effect profile places them as the 9th largest class in prescription volume in the U.S., with worldwide sales of approximately 13.6 billion in 2009.^{1,2} However, their success has been confronted by doubt as recent studies that question the safety of long term PPI use point to a spectrum of potential health consequences ranging from malabsorption to infections (such as *Clostridium difficile* and community-acquired pneumonia [CAP]). These studies have raised concerns over health conditions associated with long term use of PPIs, galvanizing FDA alerts and label changes.

PPIs are lipophilic weak bases that are protonated to the activated sulphenamide form upon entry into parietal cells of the gastrointestinal (GI) tract.³ The activated form binds covalently to and inhibits the hydrogen-potassium triphosphate pump, thereby irreversibly inhibiting acid secretion.³ There are six drugs that belong to the PPI class, of which two, omeprazole (Prilosec®) and lansoprazole (Prevacid®), are available as over the counter medications.

In March 2011, the FDA issued a warning about low serum magnesium levels associated with long term PPI use. Hypomagnesemia is an adverse drug reaction that has been observed in patients on long term PPI use, with approximately 1% of reported cases.¹ Symptoms of hypomagnesemia include tetany, seizures, arrhythmias, and hypotension and develop with a mean onset time of 5.5 years after the initiation of PPI therapy.^{1,3} Patients with this condition require hospitalization, and in 25% of cases, hypomagnesemia persists after the administration of magnesium supplements.¹ Magnesium levels are only restored after discontinuation of the PPI.¹ Furthermore, in a few notable cases, once magnesium levels were reinstated and patients were reintroduced to PPIs, symptoms of hypomagnesemia reoccurred.¹ Thus, the recurrent hypomagnesemia that occurs when a

patient is rechallenged with a PPI supports the idea of PPI-induced hypomagnesemia.

The FDA recommends that healthcare providers periodically monitor serum magnesium levels of patients on long term PPI therapy as well as those who may be taking any additional medications that are known to cause hypomagnesemia.¹ For patients who exhibit clinically significant hypomagnesemia, discontinuation of PPI therapy, magnesium supplementation, and alternative treatment with H2RAs are suggested courses of action.¹ Findings from other research studies have indicated that subsequent treatment with H2RAs prevents the reoccurrence of hypomagnesemia.²

In addition to magnesium, disturbances in calcium electrolyte levels are also associated with long term PPI therapy. Numerous studies have suggested that calcium absorption is dependent upon the acidic environment of the GI tract.¹ Therefore, a reduction in the acidity prompted by PPIs and other acid-reducing agents can lead to a decrease in calcium absorption. Bone fractures, one of the health consequences of long term PPI use, result from the domino effect of decreased GI acidity: the reduction in calcium absorption leads to decreased osteoblastic activity resulting in lower bone mineral density, thus increasing the risk of bone fractures.¹ Findings from the Canadian Multicentre Osteoporosis Study reveal that the use of PPIs is associated with lower bone density particularly at the hip and femoral neck.¹

While many studies associate long term PPI use with an increased risk of fractures, they fail to take multiple variables into account.¹ For instance, common risk factors for bone fractures observed in patients who take PPIs include: sedentary lifestyle and concomitant use of certain medications such as thiazide diuretics and corticosteroids (the former, being associated with depleting calcium levels).¹ Other variables include the dose (patients taking a higher dose of PPI are more likely to get fractures than those taking a lower dose) and duration of therapy (patients who take PPIs for more than a year are at a higher risk).¹ In regards to the causal link between long term PPI use and an increased risk of bone fractures, experimental results are inconclusive: in order

to confirm this relationship, there is a need for further research studies that investigate the relationship in the absence of confounding variables. In 2010, the FDA issued a product label warning about the increased risk of bone fractures.¹ The warning however, was restricted to OTC PPIs in March 2011.¹

The inconclusive nature of current research is echoed by FDA and American College of Gastroenterology (ACG) policy recommendations. According to the ACG, osteoporosis is not a contraindication to PPI therapy unless another risk factor for hip fractures exists.¹ In 2013, ACG issued guidelines stating that there is inadequate evidence to require routine bone mineral density testing, calcium supplementation, and other routine precautions throughout the duration of PPI therapy.⁴ On the contrary, Health Canada issued an alert in April 2013 encouraging healthcare providers to closely monitor patients with existing risk factors for osteoporosis and stated that patients should receive PPI therapy at the lowest effective dose.¹ The FDA has issued similar recommendations.¹

In addition to interfering with the absorption of certain minerals, long term PPI use can increase susceptibility to certain infections, notably, community-acquired pneumonia (CAP) and *Clostridium difficile* infections. The results of a recent meta-analysis of 9 studies involving a total of 120,863 patients are surprising. While the findings show no association between CAP and PPI use that exceeds 180 days, a strong association was observed between CAP and PPI use for less than 30 days (OR, 1.65; 95% CI, 1.00-1.21).⁵ In this way, the results point to short term PPI use as a potential risk factor of CAP rather than long term use. In addition, a strong association was also observed between CAP and high dose PPI (OR, 1.50; 95% CI, 1.33-1.68).⁵

Initially, the idea that gastric acid protects against *Clostridium difficile* colonization of the GI tract was dismissed in the face of the pathogen's means of transmission via acid-resistant spores.² It was soon revisited however, when several research studies showed a higher risk of infection in patients who use PPIs. According to the results of a 2005 retrospective study, patients taking PPIs had a 2.9-fold increase in the risk of acquiring *C. difficile* compared to those who were not on a PPI.⁶ In addition, patients on concomitant therapy of a PPI and *C. difficile*

treatment were 42% more likely to experience recurrent infection after completing therapy.⁶ While the pathogenesis remains poorly understood, it is believed that lower gastric acid levels facilitate the conversion of the spore to the vegetative form thereby allowing the pathogen to thrive in the lumen of the GI tract.²

Studies have also shown that PPIs, which are metabolized by the cytochrome P450 pathway, specifically by CYP2C19 and CYP3A4 enzymes, alter the pharmacodynamics of clopidogrel (Plavix®). As a prodrug, clopidogrel requires transformation into its active metabolite form, a process that is also mediated by CYP2C19 and CYP3A4 enzymes.² Thus, it has been thought that competition at CYP2C19 can reduce the activity of the drug. This pharmacodynamic interaction was confirmed by *in vitro* studies which showed a reduced antiplatelet effect and increased platelet activity.² In January 2009, the FDA advised against concomitant use of clopidogrel and all PPIs.² Shortly after, the recommendation was revised to warn only against omeprazole, esomeprazole, and cimetidine as potent CYP2C19 inhibitors. This modification was made on the basis of several retrospective database studies, which indicated that higher rates of stent thrombosis, myocardial infarction, and death were observed in patients taking clopidogrel with a PPI than in those on clopidogrel alone.²

While PPIs are efficacious in treating a variety of conditions, they are accessible as OTC self-treatment for long term use, which can render patients more susceptible to harmful health consequences in the absence of any monitoring or physician intervention. In the face of limited and conflicting research studies, the results of current studies serve as an introductory caveat to long term PPI therapy. More research remains to be conducted in order to disarm the underlying details of pathogenesis of long term PPI-induced malabsorption and infection.

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BRD4 Inhibition Eliminates Malignant Peripheral Nerve Sheath Tumor in Mice

By: Richard Chung, PharmD Candidate c/o 2017

Malignant peripheral nerve sheath tumor, otherwise known commonly as MPNST, is an aggressive sarcoma that can randomly form around peripheral nerves. Approximately 1 in 100,000 of the population is diagnosed with MPNST, with only 20-50% surviving five years after initial diagnosis.¹ In addition, approximately half of the cases involve those with the autosomal genetic disorder Neurofibromatosis Type 1 (NF1), which is associated with manifestations of benign neurofibromas.² Despite numerous methods of halting the growth of the tumor, these feats are nearly impossible and even after success, they do not completely eradicate the tumor. Likewise, radiation and chemotherapy have limited effects, as the tumor is not completely erased. Surgical intervention requires surgeons to separate the tumors from the nerves and increases the risk of nerve damage. Recently however, a new study emerged which showed that blocking protein BRD4 caused the cancer cells to die, leading to potentially new treatments that can eliminate this rare form of cancer.

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role in the growth of the cancer cells. BRD4 is part of the bromodomain and extraterminal (BET) family and is expressed abundantly in these cancer cells. The proteins bind to the acetylated histones on the DNA in order to regulate the expression of mitotic genes, ultimately turning them into cancer cells.^{4,5} In return, this activates BCL-2, an antiapoptotic protein, which allows the cells to continue multiplying. A study was conducted using a mouse model in order to find the correlation between the BRD4 and MPNST, and to inhibit the binding of the protein. In this case, molecular inhibitors JQ1, I-BET 151, and CPI203 function as competitive inhibitors and bind to sites where BRD4 would usually bind; JQ1 inhibitor suppresses transcription elongation.^{7,8} BRD4 occupies the promoter area of Cyclin D1, which can be inhibited by JQ1, causing a decrease in proliferation. Moreover, inhibition of BRD4 binding resulted in increased activity of proapoptotic BIM and a decrease in expression of BCL-2.

Overall, the use of JQ1 and other inhibitors to prevent growth and induce apoptosis has given physicians and other health practitioners an idea on how to utilize JQ1 in order to improve treatment in pa-

BACK TO COVER

tients who suffer from MPNST and more importantly, patients who have NF1 disorder. The real challenge now is to prepare for the clinical studies in humans after JQ1 has shown promising outcomes in mice. Although the JQ1 inhibitor is able to undergo clinical development, I-BET 151 is still being evaluated.³ This study provides a strong basis on the relationship between inhibition of BRD4 protein and the reduction of MPNST, which can help scientists develop advanced treatments for patients diagnosed with this fatal disease.

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before **March 27th**.

RHO CHI POST CLINICAL CORNER

Inotropic Agents and Vasopressors

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

AGENT	DOSING RANGE (ADULTS)	PHARMACOLOGY	RECEPTORS					CLINICAL USE	RISKS/ TOXICITIES
			α_1	α_2	β_1	β_2	DA		
Dopamine	Initial: 1-5 mcg/kg/min, titrate up to 20mcg/kg/min with max 50mcg/kg/min (although doses > 20mcg/kg/min may not have beneficial effect on blood pressure, and increase risk of tachyarrhythmias), dose may be increased by 1-4mcg/kg/min at 10 to 30 min intervals until optimal response is obtained High: > 15 mcg/kg/min, vasoconstriction	Dose dependent dopamine receptor agonist (renal and mesenteric perfusion)) higher doses activate β (inotropic) & α (vasoconstriction) adrenoceptors	+++		+++ +	++	+++ ++	Cardiogenic/vasodilatory shock Septic Shock (as an add-on agent, at doses of 20mcg/kg/min) with evidence of low CO and hypoperfusion despite achieving target MAP. Used as an alternative (2 nd line therapy) to NE only in highly selected patients (i.e. patients with low risk of tachyarrhythmias and absolute or relative bradycardia. acute decompensated HF symptomatic bradycardia	Tachycardia hypertension (at doses >10 mcg/kg/min)
Dobutamine	Initial: 2-20 mcg/kg/min sepsis/septic shock-max 20 mcg/kg/min All other patients: max 40 mcg/kg/min	Primary β_1 positive inotrope, increasing myocardial contractility (some β_2 vasodilation at doses >10mcg/kg/min)	+	+	+++ ++	+++	0	First line inotropic support Decompensated HF cardiogenic shock, symptomatic bradycardia	Tachycardia hypotension (at doses >10 mcg/kg/min)
Epinephrine	Hypotension/shock: initial 0.1-0.5 mcg/kg/minute- titrate to desired response Symptomatic, refractory bradycardia: 2-10 mcg/min (0.1-0.5 mcg/kg/min) Asystole/pulseless arrest or VT/VF: 1 mg every 3-5 minutes until return of spontaneous circulation ACLS, 2010	Stimulates α and β adrenergic receptors resulting in bronchodilation, cardiac stimulation, vasodilation. Large doses may produce constriction of skeletal and vascular smooth muscle	+++ ++	+++ ++	+++ +	+++	0	Cardiogenic/vasodilatory shock cardiac arrest bronchospasm/anaphylaxis	Tachyarrhythmia hypertension
Norepinephrine (Levophed®)	Initial: 8-12 mcg/min Usual maintenance: 2-4 mcg/min	Primary α vasoconstrictor	+++ ++	+++ ++	+++	++	0	Septic shock (1 st line therapy) Not commonly used in cardiogenic shock unless patient has significant peripheral ischemia) Hypotension	Tachyarrhythmia hypertension
Isoproterenol (Isuprel®)	Initial: 2-10 mcg/minute, titrate to patient response	Potent nonselective β agonist, positive inotrope and chronotrope, lowers vascular resistance	0	0	+++ ++	+++ ++	0	Symptomatic bradycardia Bradycardias (*Torsades de pointes), 2 nd -3 rd degree heart block	Ventricular arrhythmias Tachycardia hypotension

Reviewed by: Dr. T Jodlowski and Dr. H Shafeeq

	AGENT	DOSING RANGE (ADULTS)	PHARMACOLOGY	RECEPTORS					CLINICAL USE	RISKS/ TOXICITIES
				α_1	α_2	β_1	β_2	DA		
Symptomatic	Phenylephrine (NeoSynephrine®)	IV Bolus: 100-500 mcg IVP as needed every 10-15 minutes IV Continuous infusion: initial 100-180 mcg/minute and titrated to desired response	Potent α adrenergic vasoconstriction, Increase MAP with AS and hypotension, decreased LVOT gradient	+++ ++	++	0	0	0	Hypotension Primarily used for blood pressure augmentation and for maintenance of cerebral perfusion pressure in neurologic patients Not recommended treatment for septic shock with the following exceptions: 1) NE use is associated with serious arrhythmias, 2) CO is known to be high and BP persistently low or 3) as salvage therapy when combined inotrope/vasopressor drugs and low dose vasopressin have failed to achieve MAP target	Hypertension bradycardia
ADH Analog	Vasopressin (Pitressin®)	Shock: Continuous infusion 0.03 units/minute Pulseless arrest: 40 units (single dose) IV Bolus Diabetes insipidus: IM/SQ 5-10U two to four times a day prn	Vasoconstriction, increased water permeability in renal tubules resulting in decreased urine volume and increased osmolality	V_1 (vascular smooth muscle: vasoconstriction) V_2 (renal collecting duct system)					Primarily used as an add-on agent to NE to reach the MAP goal. Last line-therapy in cardiogenic shock cardiac arrest diabetes insipidus	Arrhythmias Hypertension decreased CO cardiac ischemia venous thrombosis
PD EI	Milrinone (Primacor®)	Loading dose: 50 mcg/kg over 15-20 minutes Continuous infusion: 0.375-0.75 mcg/kg/minute	Phosphodiesterase type 3 inhibitors: decrease cAMP breakdown, increasing myocardial contractility and lowering peripheral vascular resistance	N/A					inotropic/afterload reduction Low CO decompensated HF	Ventricular arrhythmias ventricular ectopy hypotension

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Reviewed by: Dr. T Jodlowski and Dr. H Shafeeq

Interview with Sherif Guorgui Continued

By: Sang Hyo Kim, Staff Editor

You are the Vice President of Pharmacy at the Ontario Pharmacists Association and served as the President of the Ontario College of Pharmacists for the 2011-2012 term. To address those of us who are unfamiliar with the aspects of the pharmacy profession in Ontario, can you please elaborate on your involvement in both roles, and expand a bit on the practice of pharmacy in Ontario?

In Canada, provincial governments have the authority to regulate work and professions. Hence, there are two ways pharmacy can be regulated, either by the College or directly by the government. By transferring its regulating function to the profession, the government is basically enacting the College as an agent to regulate its own members. In addition, by doing so, the government's accountability to the public is therefore also transferred to the College. As such, the mission of the College, as the registering and regulating body for pharmacy practice, is to regulate the profession to ensure that the public receives quality services and care. Therefore, all pharmacists and pharmacy technicians must meet the professional qualifications set by the College and be registered by the College in order to practice in the province. Likewise, all pharmacies must meet set standards for operations and be accredited by the College.

As member of the College Council, I was actively involved in the regulation of the profession, advancing the standards of practice and governing pharmacies, pharmacists, and pharmacy technicians in a manner that protects and serves the public interest.

As President of the College, I led the Council to achieving the expanded scope of practice for pharmacists. I also implemented new outreach initiatives such as the president's monthly newsletter and the president's confidential mailbox, which were exceedingly successful in driving a much needed culture

change through inviting, encouraging, and fostering ongoing and productive communications with pharmacists and pharmacy technicians.

With regards to the Ontario Pharmacists Association, it is the largest advocacy organization, continuing education, and drug information provider for pharmacy professionals in Canada. It is dedicated to working on behalf of patients, pharmacists, pharmacy students, and pharmacy technicians across the province to evolve the practice of pharmacy and advocate for the highest standards of professional excellence and fair compensation. The association speaks for all pharmacists, regardless of the environment in which they practice, and advocate for the quality care and well-being of their patients.

As Vice President of Pharmacy at the Association, I am responsible for the development of policies, procedures, guidelines, education and operational resources related to the advancement of pharmacy practice, in addition to advocating on behalf pharmacists and the profession with stakeholders such as government and other key policy makers.

I am truly fortunate to have had the opportunity to be actively involved in both the regulatory and advocacy bodies of the profession.

How has your involvement and experience in the Pharmacy Operations as pharmacy manager owner and franchise associate owner, broadened your scope in the pharmacy field?

The experience I gained through the ownership and operations side, in both the independent and corporate sectors, enabled me to have a healthy comprehension of the various pharmacy business models and practice settings. It helped me understand the correlation between the practice of pharmacy and the business of pharmacy and recognize that they are heavily intertwined.

"As such, the mission of the College, as the registering and regulating body for pharmacy practice, is to regulate the profession to ensure that the public receives quality services and care."

What further goals do you have in mind as the Vice President of pharmacy at the Ontario Pharmacists Association? Are you still involved with the Ontario College of Pharmacists?

In my opinion, collaboration between the Association and the College is absolutely necessary. However, their separate existence is essential to ensure there is no conflict of interest as each carries out its own mandate. Therefore, when I joined the Ontario Pharmacists Association, I decided to resign my seat on the Council of the Ontario College of Pharmacists, in order to avoid any potential perception of conflict, and hence, continue to uphold the College Council values, in particular transparency.

My main goal with the Ontario Pharmacists Association is to support it in achieving its vision of an integrated and collaborative healthcare system where pharmacists are able to practice to their full potential, and the value of the professional healthcare services they provide is widely and appropriately recognized, in addition to unifying the voice of pharmacy owners, independent and corporate, under the banner and equity of the Association.

What major changes have you seen when it comes to the role of pharmacists in clinical and corporate settings since you have become a pharmacist?

Over the past decade, the common theme in pharmacy practice was change. Our traditional role has been quickly changing from medication dispensers to healthcare providers. The reality is that the population is not only aging, but also living longer, often with co-morbidities, requiring multiple medications and ongoing care. As pharmacists, we are certainly well positioned to take a leadership role in addressing that increased demand on the healthcare system.

What are the certifications for and independent coursework involved in regards to the Leaders for

Change Program; Maytree Foundation, which you were part of?

I participated in the Leaders for Change program in 2001/2002. It is a leadership program committed to building the capacity and strengths of immigrants as potential leaders in the Canadian society. It is a nine-month program, offered through the Maytree foundation, and involves a variety of learning environments and opportunities, including mentoring, skills-based training and self-directed action projects. The program was launched in 1999 and has approximately 180 alumni to date.

Some pharmacists may find the thought of regulated pharmacy technicians (RPhTs) unsettling. You mentioned in a previous interview: “waiting to have a wide adoption of more patient-centered services by pharmacists before the introduction of regulated pharmacy technicians was not necessarily going to be a more effective strategy.” How much do you support the idea of expanding the

role of technicians in pharmacy setting?

There is no doubt that one of the main barriers preventing pharmacists from properly adopting the expanded scope of practice and enhanced patient-centered services – is time. Therefore, in order to be

able to incorporate additional services into daily practice, changes must be made to both the traditional workflow and business models. That’s where the incorporation of regulated pharmacy technicians into the workflow would be extremely valuable.

The initial step for a successful transition would be for pharmacists to stop performing the counting, packaging, labeling and checking routines and delegating these technical functions to qualified pharmacy technicians. Please note that pharmacy technicians in Ontario now have an independent authority to sign off on the technical aspects of the prescription preparation, allowing pharmacists to focus on the therapeutic appropriateness and clinical consultations/services. Perhaps one of the reasons why the majority of pharmacists are yet to capitalize on the incorporation of regulated technicians into their prac-

“Collaboration between the Association and the College is absolutely necessary. However, their separate existence is essential to ensure there is no conflict of interest as each carries out its own mandate”

tice is because, in the current/traditional workflow, the function of doing the final (technical) check of a prescription and determining its therapeutic appropriateness is done as one step, by a pharmacist, at the end of the dispensing process.

However, these are in fact, separate functions that can be done by two distinct regulated health-care professionals (ie. a pharmacist and a regulated pharmacy technician). There is no doubt that the evident net result of having a pharmacy technician responsible for independently authorizing the final check of prescriptions is that pharmacists will have much more time than they currently do, which would ultimately allow for more opportunities to deliver on their expanded scope and enhanced services.

What is your opinion on the creation of the Pharmacy Technician Accreditation Commission (PTAC), which will be tasked with assuring and advancing the quality of pharmacy technician education?

This is certainly an important step in the right direction. In Canada, Ontario was the first province to regulate pharmacy technicians in December of 2010. This means that now pharmacy technicians have to meet entry-to-practice requirements in order to be registered with the Ontario College of Pharmacists (the College). As such, they have to graduate from an accredited pharmacy technician program, and complete a twelve-week internship under the supervision of a preceptor. In addition, they must successfully pass the Pharmacy Examining Board of Canada qualifying examination, as well as the College's jurisprudence exam. They must also pay an annual registration fee with the College and maintain personal professional liability insurance. In addition to having continuing education requirements and being subject to the College's quality assurance, complaints and discipline processes. Therefore, a "pharmacy technician" is now a restricted title in Ontario. If someone wants to work in a pharmacy without going through the above process, they would be called a "pharmacy assistant."

In past interviews, you emphasize the need for pharmacists to accept and embrace the "expanded

scope" in acquiring the confidence to practice beyond the traditional comfort zone. Can you explain to us the specifics of the "expanded scope" and what we as students should expect in the future?

In October 2012 the Ontario government officially announced the regulation permitting an expanded scope of practice for pharmacists. Under the new scope, pharmacists are now able to:

- Prescribe specified drug products for the purpose of smoking cessation;
- Renew and adapt (alter dose, dosage form, regimen, or route of administration) prescriptions
- Perform a procedure on tissue below the dermis to support patient self-care and chronic disease monitoring;
- Administer, by injection or inhalation, substances listed in the regulation for the purpose of education and demonstration; and
- Administer influenza vaccine to patients five years of age and older in accordance with Ontario's Universal Influenza Immunization Program (UIIP).

Furthermore, the Ontario Pharmacists Association is heavily advocating for further scope expansion to include routine immunizations, prescribing for minor ailments, making therapeutic substitutions and authority to order lab tests.

Hence, as the pharmacist's role continues to expand, as the use of technology continues to grow, and as the practice and business models continue to evolve, you should expect that in the future your main role and responsibilities will in essence be beyond the counter. You will be more involved in patient care and their medication therapy management. Employers will be looking for pharmacists who can utilize their cognitive skills to effectively communicate with patients and deliver on clinical services. Moreover, there will be a much needed transition from "black or white" practice rules to practicing in the "grey". As patients' conditions and medications get more complex, pharmacists would be expected to rely more on their professional judgment to make decisions tailored to their specific individual patient's needs. That's a fundamental shift from the traditional

role of following directions to a new role of making decisions.

You have had international pharmacy experience as a member of the American Pharmacists' Association and the International Pharmaceutical Federation. Can you describe what that has been like for you? How did these international experiences influence your perception of the pharmacy industry?

Exposure to international pharmacy practice has been an invaluable experience. It is a great opportunity to connect with colleagues from around the world, share information, best practices and resources, as well as exchange views and solutions to common challenges.

For students studying pharmacy at St. John's University, can you give us some words of advice from your college and work experience?

As you begin your career in pharmacy, make sure you take the time to properly explore the wide range of career paths options available to you. Your pharmacy degree offers you a variety of sectors to practice in such as community/retail, hospital, research, academia, industry, regulation, advocacy, administration, etc. Never make your career choice based on short term gains (such as a higher starting salary for instance), but rather plan your career in

Never make your career choice based on short term gains (such as a higher starting salary for instance), but rather plan your career in advance and make your decision based on where it would lead you five and/or ten years later.

advance and make your decision based on where it would lead you five and/or ten years later. Also, as I mentioned earlier, the practice of pharmacy and the business of pharmacy are intertwined, so make sure you understand and learn about the economics of pharmacy. Lastly, as the future leaders of the profession, it is paramount that you seek active involvement in local and/or national professional organizations. In addition to contributing immensely to your personal and professional growth, such involvement would also provide you with fulfillment from giving back to your profession.

What is your opinion of the *Rho Chi Post*? Do you think, as a student run newsletter, there is anything we should be focusing more on?

I am extremely impressed with your newsletter, the quality of the articles, and the choice of topics. I also have to commend you for reaching out to interview local, national, and international thought-leaders in the profession. Keep up the good work.

The *Rho Chi Post* would like to thank Sherif Guorgui for sharing his time and expertise!

To Defend the People

By: Davidta Brown, Senior Staff Editor

As the world's largest market for pharmaceuticals, the United States receives many medications manufactured abroad.¹ Patients, physicians, and pharmacists defer the responsibility of ensuring the quality of these imported drugs to the FDA, but it only takes one report of deceit in the pharmaceutical industry for this trust to be shaken. In 2005, an employee of Ranbaxy Laboratories Ltd., a major manufacturer of generic medications sold internationally

and in the U.S., reported multiple cases of fraudulent or nonexistent drug evaluation data to his superiors.² The test results required for generic drugs to receive approval had been altered, while evidence of the actual tests was lacking. After an alarming lack of response from corporate directors, the employee turned to the FDA, initiating an investigation that spanned several years and culminated in the prohibition of drug imports from certain Ranbaxy facili-

ties, as well as the collection of \$500 million in fines.³

The free market ordinarily punishes those who would cheat the general public, without any regulatory interference - when a company produces poor quality merchandise, consumers choose to spend their money elsewhere. Unfortunately, consumers in the market for pharmaceuticals do not have the same freedom of choice. The consumer sacrifices the ability to freely make decisions in the market, and leaves the judgment between goods to medical professionals. As a result, when news of fraudulence like that exemplified by Ranbaxy is brought to light, patients can be expected to feel that their best interests are not prioritized. They may anxiously search their medicine cabinets for "bad drugs," or stop taking their medications entirely. The fear generated by behavior like Ranbaxy's is easily as harmful as the substandard medications themselves, and the remedy to that fear is for the patient and consumer to feel that they have a genuine ally in the FDA.

It is beyond the scope of the FDA's authority to anticipate corporate greed and prevent pharmaceutical manufacturers from taking shortcuts, but interested parties can still wonder how patients may protect themselves from deceitful activity. The first question to ask is whether the ability to submit falsified documents to the FDA and receive approval to market generic drugs indicates a deficiency in the regulatory powers of the FDA, or in the generic drug approval process. This question ought to be answered with a negative. Unlike approval applications for completely new drugs, generics are approved through an Abbreviated New Drug Application, which requires data proving bioequivalence to the original drug rather than clinical data on safety and efficacy.⁴ The abbreviated drug approval protocol that is meant to encourage competition necessarily leaves manufacturers to an honor system. However, this should not imply that more stringent testing should be required of generic drug manufacturers. If generic drugs were put up to the level of testing and scrutiny that patented brand name drugs receive, very few manufacturers would enter the generic market, and all patients would suffer from the resulting elevation of drug costs. The solution to the problem of protecting the public from fraud must be sought elsewhere.

If the FDA appears to take cheating seriously,

the patient can trust that FDA approval signifies reliably high standards. Actions such as prohibiting the manufacture of FDA approved drugs at specific plants, which the FDA carried out against Ranbaxy as recently as last September, remind patients and healthcare providers that the established regulatory body is active and working, especially when reports of such actions are well publicized.⁵ In instances such as these, the appropriate response to manufacturers who break the rules is not increased regulation or harsher punishment, but chastisement that is louder and more visible. Patients and healthcare providers simply need to be reminded that the regulatory body that exists to protect them is still doing its job, and that physicians and pharmacists can be trusted to take all relevant factors into consideration when deciding on a course of therapy.

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Low Literacy and Medication Management?

By: Jenny Park, Pharm. D. Candidate c/o 2015

As the Affordable Care Act brings health care to many people who are currently uninsured, healthcare providers should expect an increase in the number of patients who don't understand their plan, disease states, and medications. Health literacy is defined as "the degree to which individuals have the capacity to obtain, process, and understand basic health information needed to make appropriate health decisions to treat illness."¹ Patients with low literacy may have difficulty understanding instructions, which could affect their medication management and understanding of the importance and consequences of their behaviors in regards to the management of their health.

According to Ellen Peters, Ph.D., of Ohio State University in Columbus, 62% of uninsured adults and 50% of insured adults were not able to answer a simple question regarding when they should be taking their medication.² A good majority of adults, insured or otherwise, will have difficulty answering questions about their medications. Michael Wolf, director of the Health and Literacy program at Northwestern University, has shown that patients with low health literacy have a tendency to take their drugs more times a day than is necessary. Part of this problem lies in the directions. The United States Pharmacopeial Convention (USP) issued a section titled "Prescription Container Labeling," in an effort to standardize patient prescription labels. The chapter details that the directions provided on the label should specify what time of day the medication should be taken, such as in the morning, noon, evening, or at bedtime. Directions, such as "take twice a day," can be confusing and lead to various errors.² Changing that same direction to "take two tablets by mouth every 12 hours," removes any ambiguity of when the patient needs to take their medication.

Patients with low literacy may have difficulty understanding instructions, which could affect their medication management and understanding of the importance and consequences of their behaviors in regards to the management of their health.

Medication errors don't just occur on the patient's end. The Institute of Medicine also reports that poor labeling is the central cause for medication errors in America. Errors due to look-alike or sound-alike medications are common. From my work experience, many coworkers and technicians have pulled the wrong drug while dispensing. That is why there is always a first verification and second verification done by the pharmacists in retail stores.

Many patients have difficulty distinguishing their medications. While patients often identify their medications by the color and shape, many medications can appear similar. Besides look-alike sound-alike medication errors, 33% of medication errors come from packaging and labeling confusion. About one third of adverse drug events occur in the outpatient setting,³ which brings us back to the importance of

patient counseling. Patients with low literacy not only misunderstand written directions, but they also have difficulty understanding the auxiliary labels. On top of the medication label itself, the addition of an auxiliary label may frighten patients when they read labels such as "may cause drowsiness". There have been many patients that are worried

about the side effects that the labels forewarn about and tend to overthink these side effects. While labeling errors are not reflective of patients with low literacy, it does add to the confusion. Therefore, effective patient counseling and reassurance is especially crucial in this population.

A trial conducted at The General Medical Clinic in Atlanta, published in *The Journal of General Internal Medicine*, evaluated the effects of low literacy and medication management. According to the results of the trial, medication management and literacy are correlated ($P < 0.001$).⁴ The medication management capacity was measured using a grading scale of a patient's ability to identify, open, describe the dose and timing of their medications. Liter-

acy skills were accessed using the Rapid Estimate of Adult literacy in Medicine (REALM). Patients were tested on their ability to read 66 common health terms and were placed into three groups: inadequate, marginal, and adequate. Inadequate represented a reading level of less than a 6th grader, while marginal represented a level comparable to a 7th to 8th grader. Adequate indicated a reading level higher than a 9th grader. Much of the variability in scores came from medication identification. About 38% of the low literacy patients were unable to identify their medications even though they were looking at the bottle, label, or pills themselves.⁴

Adults with low literacy skills have a diminished ability to identify their medications, and steps must be taken to better educate them on their drug regimen. Healthcare providers should provide better communication to their patients on how to incorporate their medication schedule into their daily lives. If the physician misses the opportunity to go over a patient's prescriptions, the pharmacist is next in line. Counseling is key for successful medication management! However, if the pharmacist does not counsel, the prescription label is all that is left for the patient. Both physicians and doctors must be aware of these crucial checkpoints and account for literacy before starting a patient on medication therapy.

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1. American Academy of Pediatrics. AAP website. Available at <<http://www.aap.org/en-us/professional-resources/practice-support/Patient-Management/pages/Culturally-Effective-Care-Toolkit-Literacy-and-Health-Literacy.aspx?nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token>> Accessed October 19, 2013
2. ASHP. Poor quantitative skills of newly insured may affect ability to manage medications. ASHP website. September 1, 2013. Available at <<http://www.ashp.org/menu/News/PharmacyNews/NewsArticle.aspx?id=3939>> Accessed October 19, 2013
3. Jeetu G, Girish T. Prescription drug labeling medication errors: a big deal for pharmacists. *Journal of Young Pharmacists*. 2010;2(1):107-111. Available at <<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3035877>> Accessed October 19, 2013
4. Kripalani S, Henderson L, Chiu E, Robertson R, Kolm P, Jacobson T. Predictors of medication self-management skill in a low-literacy population. *Journal of General Internal Medicine*. 2006;2(8):852-856. Available at <<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1831567/>> Accessed October 19, 2013.

Now available at our NEWLY RE-DESIGNED website: <http://rhochistj.org/RhoChiPost/>

Check out our new options under the "For Authors" tab:

To sign up for a topic visit <http://rhochistj.org/RhoChiPost/article-signup/> and click sign up.

If you want to write an article that is not on our topic list, suggest the topic by visiting <http://rhochistj.org/RhoChiPost/suggest-articles/>

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*a login is required to view these features

RHO CHI POST

Are You Smarter than a 6th Year?

Crossword Puzzle: Drug Top 200 Challenge

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!

a m v b l n n r l i i a n c e s b
e i l l y y t l s c v l i a e r c
a u n r c s x c i i c r v c a i o
c c a n i p l o r e y f y g e c r
g s r e a s e i v t f l t c o a t
o x g p l r p l p e i a i e s i h
r e t n i s n e t o l g l t l p o
e e r r s e c a r o i y a c i r t
r n c p d i d n r d b l e h r l r
v a i a r i a t l e a l c r a l i
n e r a t l o v / m a l f a t a c
c c r l g c a d i p e x s c s r y
y t r e u t o c l o p i d i i e c
l o r l l a t e c g r a r n v d l
c c g a o a r i e n r d c e / d e
c v l i l r n r l e l v p b i a n
i d r y e o e a e e t c r r l e a

Tiotropium	Clindamycin
Benazepril	Metronidazole
Lamotrigene	Ethinyl Estradiol + Norgestimate
Olmesartan + HCTZ	Tadalafil
Donepezil	Phentermine
Risperidone	Levothyroxine
Glipizide	Hydroxyzine
Amphetamine + Dextroamphetamine	Diclofenac
Aripiprazole	Metoclopramide
Verapamil	Gemfibrozil

Answers



By Erica Dimitropoulos
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. This drug is a purine antimetabolite that inhibits adenosine deaminase, ultimately blocking DNA synthesis and causing cell death. It has an indication for the use in hairy cell leukemia.
2. Patients taking this medication need to be monitored for muscle weakness and changes in liver function
3. This drug is a reversible inhibitor of gastric and pancreatic lipases. It is indicated for weight reduction in patients with a BMI $\geq 30\text{kg/m}^2$ or $\geq 27\text{ kg/m}^2$ in the presence of risk factors such as diabetes, hypertension, or dyslipidemia
4. Due to its mechanism of action, use of this drug with mercaptopurine is contraindicated.
5. This drug is not an antiviral, yet it is a component of the HIV medication, Stribild. It is used for its enzyme inhibiting properties to achieve greater concentrations of other medications in the blood.
6. This drug works by inhibiting of 14-alpha demethylase and therefore prevents the conversion of lanosterol to ergosterol
7. This medication may be used in combination with an antibiotic regimen for the treatment of *H. Pylori*
8. Patients must be urged to avoid alcohol during and for three days after treatment with this medication.
9. This drug can be used for hormone receptor-positive breast cancer in postmenopausal women.
10. This drug is used for the treatment of hyperthyroidism and thyrotoxicosis

- A. Febuxostat
- B. Cobicistat
- C. Orlistat
- D. Pentostatin
- E. Pravastatin
- F. Fluconazole
- G. Letrozole
- H. Carbimazole
- I. Rabeprazole
- J. Metronidazole

How Did You Do???

Answers to Word search & Look Alike and Sound Alike

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

a m v b l n n r l i i a n c e s b
e i l l y y t l s c v l i a e r c
a u n r c s x c i i c r v c a i o
c c a n i p l o r e y f y g e c r
g s r e a s e i v t f l t c o a t
o x g p l r p i p e i a i e s i h
r e t n i s n e t o l g l t l p o
e e r r s e c a r o i y a c i r t
r n c p d i d n r d b l e h r l r
v a i a r i a t l e a l c r a l i
n e r a t l o v / m a l f a t a c
c c r l g c a d i p e x s c s r y
y t r e u t o c l o p i d i i e c
l o r l l a t e c g r a r n v d l
c c g a c a r i e n r d c e / d e
c v l i l r n r l e l v p b i a n
i d r y e o e a e e t c r r l e a

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



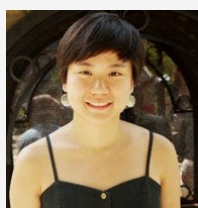
@ Katharine Cimmino (5th Year, STJ; Editor-in-Chief)

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.



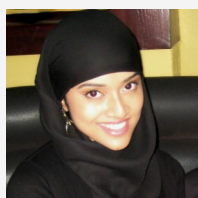
@ Bharat Kirthivasan (PhD Candidate, STJ; Co-Copy Editor [Content-Focused])

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.



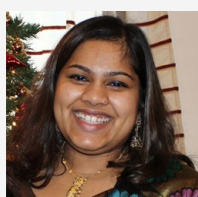
@ Erica Dimitropoulos (5th Year, STJ; Co-Copy Editor [Content-Focused])

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])

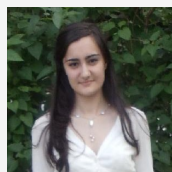
The Rho Chi Post has been a source of current information and great advice to students and professionals in this evolving profession. After years of experience in media and graphics-related work, it is now my privilege to be a part of this endeavor as a Co-Copy Editor. I hope you learn as much from future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



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

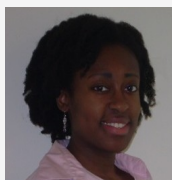
We as future healthcare professionals owe it to our patients and ourselves to become aware and current on the events affecting our profession. The Rho Chi Post is our way to learn new things and stay in touch with the pharmacy world, on- and off-campus. I have gained so much from reading previous publications 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



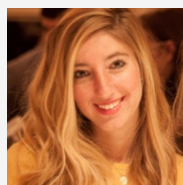
@ Tamara Yunusova (3rd Year, STJ; Senior Staff Editor)

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.



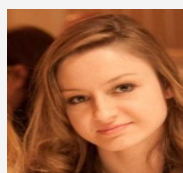
@Davidta Brown (3rd Year, STJ; Senior Staff Editor)

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.



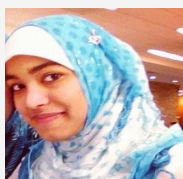
@ Ada Seldin (5th Year, STJ; Staff Editor)

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.



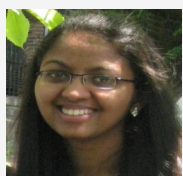
@ Sang Hyo Kim (2nd Year, STJ; Staff Editor)

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

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UPCOMING EVENTS

Mar 28-31: APhA Annual Meeting
Orlando, Florida

Apr 2-4: AMCP Annual Meeting
Tampa, Florida

Apr 3: Pharmacy Career Day
St. John's University

May 17-20: NABP Annual Meeting
Phoenix, Arizona