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PROVIDING THE HELPING HAND

by Maria Sorbera, PharmD Candidate c/o 2013

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

A famous American author, Alan Loy McGinnis, once said, “There is no more noble occupation in the world than to assist another human being - to help someone succeed.” Helping student pharmacists do well in school, careers, or their personal lives allows us and our society to advance in unison. It is especially important for us to support others’ goals, whether they are our patients or colleagues.

My name is Maria Sorbera, and I am the president of Rho Chi Beta Theta chapter at the Arnold & Marie Schwartz College of Pharmacy and Health Sciences at Long Island University. I believe that assistance is a crucial aspect of the pharmacy profession. Teaching and mentoring future generations of pharmacists, counseling patients, and optimizing drug therapies are just some of the ways that we can achieve our objectives. As professionals, we help each patient succeed in his or her drug therapy, and this effect does not simply stop at that one patient - it continues onto the next. A pharmacist’s helping hand is never felt by just one person, whether it be a mother, father, grandparent, sibling, or friend. When patients achieve key pharmacotherapeutic goals, they live healthier lives that they can share with loved ones.

Similarly, through Rho Chi’s tutoring sessions, student pharmacists have helped others become successful. Each week, there are scheduled sessions, and students are able to make appointments, as well. At LIU, we are also involved in health fairs and fundraisers for various causes. Helping our fellow peers achieve academic success forms a sense of unity amongst the students - we are always there to lend a hand. I hope each member applies these learned skills in his or her future career, and continues to help others.

Overall, improving our patients’ lives will be a team effort. It is evident that pharmacists working toward a common goal will greatly improve patients’ outcomes. Through consistent communication, patients will also develop feelings of confidence and trust in our profession. My goal for pharmacy is a sense of unity, and I believe it will be achieved through our future generations’ pharmacists. By working together, we can become a stronger profession with a unique, clinical niche in society. Pharmacy will have a stronger voice, and its professionals are always willing to extend their helping hands.

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COVER—by Christian Baude—The community pharmacist dispensing a product of pharmaceutical research. Originally from Rho Chi's "Recipe" newsletter published in November 1966.

ALUMNI SPOTLIGHT: REDUCING MEDICATION DISPENSING ERRORS

by Joseph Saffi, RPh



Joseph Saffi is a St. John's University College of Pharmacy graduate, class of 1985. He is currently the supervising pharmacist at Pathmark Pharmacy of Franklin Square in Long Island, New York, and has been working for Pathmark pharmacies since 1988. Mr. Saffi is also a community pharmacy preceptor with St. John's University and Rutgers University schools of pharmacy.

I would like to discuss medication dispensing errors. One of my least favorite tasks as a supervising pharmacist is filling a variance report or what is known as the dispensing error report. Dispensing errors are inherent to our profession. With longer work hours, lack of meals and rest breaks (a topic of future discussion), and reduced staffing, errors are something every pharmacist will experience at some time. It is not a matter of "if" - but when. Hopefully, the error will cause no or minimal harm to the patient. In my experience, all errors cause some degree of mental duress to the pharmacist involved.

When filing these reports, two things continue to bother me: lack of documentation and the failure to communicate with the patient. Many times, I find that pharmacists place calls to a prescriber to verify prescription information and fail to document pertinent information (vital information such as who you spoke with and the date/time). Some pharmacists also fail to document the outcome of an intervention or doctor call. These pieces of information are important, both, to the legal team and a fellow pharmacist, and are impossible to recall after-the-fact or even minutes later.

Many of these errors, some serious, could have been prevented if the pharmacist had asked a few simple questions, such as "why did you go see the doctor?" or "have you received this medication in the past?" In fact, another great opportunity to prevent errors is during the counseling session with a patient. Questions such as "how were you told to use this medication?" or "what were you told to expect from this medication?" can provide pertinent information that can prevent or help catch a prescription error. I have found that many times, patients will produce an old vial or some other type of information that can clarify or justify why they are taking a medication at an unusual dose or if they are using the medicine for an off-label use.

In some cases, pharmacists made unsuccessful attempts to reach a prescriber, failed to question the patient or guardian, and dispensed what was thought to be the correct medication. The patient may not be your best source of information, but he or she is the best available source at the moment in our pharmacy. By engaging with the patient during a counseling session or during the process of filling a prescription, a wide range of errors can be prevented. This also highlights the need for a pharmacist to have a positive relationship with the patients and how we play a crucial role in the community as primary caregivers.

Hopefully, electronic prescribing will help reduce prescription errors due to legibility issues; however, keep in mind that these are not error-proof either. These "e-scripts" are as good as the person inputting the information and may be prone to mistakes. As a pharmacist, I have come across many prescribing errors associated with these electronic prescriptions.

To reduce the incidence of prescription errors, it is essential to adopt good work practices earlier in your professional careers. The skills you learn during your school, experiential rotations, and intern work hours will enable you to become a more proficient pharmacist. Remember to document all interventions and doctor calls with appropriate information, as well as build a strong relationship with your community and your fellow professionals. Community pharmacy is a scattered and hectic work environment, but we need to remain organized, energized, and focused.

A DAY IN THE LIFE OF A CARDIAC CARE UNIT PHARMACIST

by Dr. Manouchkathe Cassagnol



Dr. Manouchkathe Cassagnol is an Assistant Clinical Professor at St. John's University College of Pharmacy and Allied Health Professions and a Clinical Coordinator of Internal Medicine and Cardiology Pharmacotherapy at Long Island Jewish Medical Center.

About 81 million people in this country suffer from cardiovascular disease. Therefore, as pharmacy practitioners, we will all be providing care for many of these patients, either through health-systems, ambulatory care clinics, or community pharmacies. My clinical rotation at Long Island Jewish Medical Center (LIJMC) is a 14-bed cardiac care unit (CCU) that provides intensive care for patients suffering from acute coronary syndromes, acute decompensated heart failure, and cardiac arrhythmias.

Student pharmacists will be incorporated as part of an interdisciplinary team of cardiology faculty and fellows, medical residents, nurses and nurse practitioners, and physician assistants. Pharmacy students engage in discussions (about clinical pathology of heart disease and the pharmacology of cardiovascular treatment), collaborate with various healthcare professionals (to tailor pharmacotherapy), and provide education (to patients, families and other allied health professionals). During educational rounds, students will have opportunities to interact with patients and providers, see minor bedside procedures, and view/discuss cardiac monitor and various cardiac procedure findings (catherizations, ECGs, etc).

Part of this rotation helps to highlight the impact that pharmacists have on medication compliance and adherence. Students can also be involved in activities surrounding a patient's discharge from the hospital. It is often the case that patients come into the institution without ever being on medications. After certain procedures, these patients are often placed various medications that will help protect their heart. This time of transition is where we, as pharmacists, can help patients navigate the difficult landscape.

From the time students walk through the doors of LIJMC to the time they leave, they are engulfed in an environment that places patients' needs first and learning second. These two elements help to build students' empathy and compassion for patients, and allow them to hone their skills as future practitioners.

EVENT SPOTLIGHT: WHO WANTS TO BE A PHARMD GAME SHOW

by Marie E. Huang

As the studio lights dimmed and the dynamic music played in the background, many students gathered in St. Albert Hall B75 in anticipation of who will be crowned the game's next "PharmD." A competitive air dangled, but the crowd chattered excitedly as a generous lunch was provided. Four seats lined the front of the amphitheatre – three for team members and one designated for Mohammad A. Rattu, our returning game show host. Mr. Rattu discussed the rules of this year's game, as well as the three lifelines: ask the audience, consult a pharmacist (Dr. Maidhof or Dr. Patel), or use the textbook ("Applied Therapeutics: The Clinical Use of Drugs" by Koda-Kimble or the "Drug Information Handbook" by LexiComp).

All questions and participating teams were randomly selected. The first team to step up to the plate was **Chak de India** (Marina Chamakala, Stanley Saji, and Shawn Varghese), who struck out after five questions on a question regarding α_2 -adrenergic receptor agonism of brimonidine, thus sealing their places as "first semester aces." It was then **Team Weapon Rx**'s (Gokul Kalla, Jonathan Chan, and Jay Chadderwala) turn to play their luck on the board. When asked, "Which medication does not usually induce hypokalemia?" they sought the audience's advice. Indeed, digoxin was the answer! After speeding their way to the tenth question, **Team Weapon Rx** encountered their most challenging question yet: "Which of the following may cause up to a 20% increase in cholesterol within a few months of initiating therapy?" Upon choosing "methylprednisolone" as their (incorrect) final answer, they left the hot seat with great dignity.

Next came **Team Roflcoxib** (Albert Bergagnini and Nicholas Caselli), two of the three 6th year PharmD candidates who were first place winners in last year's over-the-counter-themed version of the game. When asked, "Which of the following drugs exhibits Michaelis-Menten Kinetics?" they were lucky to be sitting in a room half full of 5th years who just recently took their second advanced pharmacokinetics exam. Mr. Bergagnini and Mr. Caselli cruised through 11 questions while wisely using up the three lifelines they were provided. Unfortunately, the initial replacement dose of nicotine that should be given to a patient who smokes more than 10 cigarettes per day is 21mg, not 14mg. **Team Roflcoxib** then returned as the highest scoring team thus far.

The lottery selected **Team MR.N** (Mickey Aggarwal, Raymond Wu, and Neal Shah) to take the hot seat next. Six questions in and no lifeline exploited, Dr. Maidhof was eventually prompted with the question, "Which of the following does not increase INR when taken with warfarin?" A tricky question like this stumped our pharmacist lifeline and even the whole crowd as the correct answer, "green tea" (instead of "melatonin"), flashed on the screen.

Team 3.14 (Feroze Karanjia, Jena Marion, and Rane Jabonillo) soon asked Dr. Maidhof, "Which of the following is not a notable side effect of amphotericin B?" and correctly responded with "hepatitis." Unfortunately, the group claimed their place as "second semester aces" after using the audience lifeline for "Which of the following is a second-generation protease inhibitor?" - a question that barely anyone in the room knew the answer to.

The second round of “Who Wants to be a PharmD?” took place one week later in order to break a tie and to give the two remaining teams the opportunity to play. **Group A** (Marina Ermolaeva, Alex Martinez, and Nick Scapelito) stepped up first to the plate. Six questions in, they consulted Dr. Patel when asked, “What is the recommend elemental iron intake (mg/day) required for treating iron deficiency anemia?” Their final answer turned out to be incorrect when 200mg appeared on the screen. Next, it was **Team Vitamin M**’s (Sharon Janak, Yi Liu, and Lauren Kaveski) turn to have a shot at the questions. With ease, they breezed through nine stages and were faced with a stumper: “Which of the following is an anaerobic, infectious organism?” Confidently, **Vitamin M** chose “Pseudomonas,” but it was incorrect.

To conclude the game show, **Team 3.14** and **Vitamin M** competed in a tie breaker. After six extremely perplexing questions and many held breaths, the members of **Team Vitamin M** sealed their spot as 3rd place winners!

THE FINAL SCOREBOARD:

- 1st Place: Roflcoxib (11 points) – receiving \$35 Macy’s gift cards
- 2nd Place: Weapon Rx (10 points) – receiving \$25 Amazon.com gift cards
- 3rd Place: Vitamin M (9 points) – receiving \$15 Dunkin’ Donuts gift cards
- 4th Place: Team 3.14 (9 points)
- 5th Place: MR.N (6 points)
- 6th Place: Group A (6 points)
- 7th Place: Chak de India (5 points)

Congratulations to all the winners, participants, and others who attended this riveting event! Many thanks to the faculty members and students who made this event possible.

Tune in next year to see who will be crowned the next “PharmD” of the game!



FACULTY SPOTLIGHT: DR. CHARLES R. ASHBY

by Neal Shah

Dr. Ashby is a well-known Pharmacology professor for student pharmacists studying in their professional years. He graduated from the University of Louisville with a BA in Biology and Psychology in 1983. After obtaining his PhD in Pharmacology from the University of Louisville in 1987, he continued his education by obtaining a Post-Doctorate in 1991 from SUNY Stony Brook. He was employed at Brookhaven Labs as an Associate Scientist from 1991-1995, and has taught classes at St. John's University since 1995.

I recently had the opportunity to interview Dr. Ashby for our faculty spotlight.

Q: What does your laboratory primarily focus its research on?

A: Our lab is interested in finding compounds that will reverse multi-drug resistance (MDR) in cancer cells. Specifically, this would include drugs that block ATP-binding cassette (ABC) transporters, as they actively transport drugs from the cell, thereby attenuating their therapeutic efficacy.

Additionally, I collaborate with Dr. Sandra Reznik on research designed to reduce pre-term birth caused by inflammation. We serendipitously-discovered that a solvent known as N,N-dimethylacetamide (DMA) significantly decreased lipopolysaccharide (LPS) -induced pre-term birth in mice. Originally, we were using DMA as a solvent for another compound that was an inhibitor of the enzyme p38a mitogen-activated protein kinase (MAPK). The injection of DMA alone (control group) dose-dependently decreased pre-term birth and levels of certain inflammatory mediators.

I am also working with a colleague from Furman University in South Carolina on a model of binge-drinking mice. In this model, we are determining if the acute and chronic administration of dopamine D₃ receptor antagonists decreases binge drinking. Currently, the compound SB-277011A produces a significant decrease in binge drinking after acute and chronic administration.

Q: Why did you choose to teach Infectious Diseases and Respiratory?

A: The Drugs and Diseases sections were created by College of Pharmacy and Allied Health Professions. Subsequently, I was assigned to teach the Infectious Diseases and Respiratory Drugs and Disease modules by my Chairman, Dr. Louis Trombetta. I was not an expert in either subject, but through teaching them, I gained an interest in antimicrobial drug resistance and inflammation.

I have also worked with Dr. Talele and Dr. Hardej in synthesizing and testing rhodanine analogues against methicillin-resistant *Staphylococcus aureus* (MRSA) strains *in vitro*. One of the compounds had efficacy against MRSA similar to what we have seen with vancomycin.

Q: Antibiotic resistance has become more rampant recently, especially in hospitals. If we continue to overuse antibiotics—even in empiric therapy—do you think complete resistance will occur?

A: Absolutely. If broad-spectrum antibiotics are incorrectly prescribed or overused, antibiotic resistance will occur; thus, in terms of therapeutic options, it will force us to continually “up the ante.” This is problematic, as over the last 30 years, the number of pharmaceutical companies developing antibiotics has decreased. Although resistance will inevitably occur, the rate and extent of resistance will be difficult to predict. Many practitioners who I have spoken to generally do not give antibiotics immediately; they typically wait for positive culture identification via throat swabs, urine, or blood samples.

A decrease in the misuse of antibiotics can help decrease the incidence of resistance. In countries like Norway and England, a meta-analysis paper looked at a ten-year period decline in antibiotic prescribing and use. It showed that when the use of antibiotics decreased, especially wide spectrum drugs, there was a significant decrease in the incidence of resistance. This approach, “effective antibiotic stewardship,” should be used globally.

Q: When you are not teaching or working in your lab, what do you do?

A: My wife and I like to travel. Over the past 20 years, we have gone to Iceland, as well as toured the Scandinavian countries of Denmark, Sweden, Norway, and Finland. We also went above the Arctic Circle at one point. During a cruise of Mediterranean, we visited the island of Crete and Mykynos. We have done tours of Germany, Switzerland, Italy, and France, as well as three cross country trips in the United States – New York to California. The canyons in the southwestern Utah were among the most memorable sites.

Q: What do you think about Occupy Wall Street? On one hand, people shouldn't expect handouts because hard work is the backbone of success. On the other hand, what bankers did to the world economy cannot be justified.

A: Americans have the right to lawfully protest what they think is wrong. The freedom of speech, with some reasonable restrictions (e.g. not allowing slander or libel) is important. I do not know the exact position of the protesters. However, I think that most protestors do not desire to get rid of the free market or capitalism; they want corporations to be held accountable for the events that lead to the market collapse in 2007. Corporations and capitalism can and do co-exist, but they both must have fidelity to the law. If they break the law, they have to be held accountable.

Q: You are infamous for drinking Nesquik - what is your favorite flavor? What is your favorite fast food? And if you had to have one meal for the rest of your life, what would it be?

A: Chocolate is the best flavor of Nesquik, without a doubt. I have tried banana, strawberry, vanilla - they're not for me. I do not eat that much fast food; so, this question is hard to answer. I do like Chinese food, particularly the spicy variety, as well as Italian cuisine. If I had one meal to eat the rest of my life, I would have to say lobster with a baked potato and butter, with some type of salad.

Q: Do you think the FDA is being too restrictive on criteria for accepting drugs, or do you think instances like Vioxx® are justifications?

A: The use of any drug involves examining the benefit/risk ratio. The FDA has to consider these two parameters in the drug approval process. If a drug used to treat mild headaches causes severe diarrhea, it probably would not get approved due to the low benefit/risk ratio. However, if a developed drug significantly decreases mortality for leukemia while causing severe diarrhea, this benefit/risk ratio may be acceptable due to the final outcome. Additionally, by mandating that companies submit Phase IV post marketing data, the FDA can monitor for adverse effects with low incidences (and were not detected in Phases I-III).

Q: Do you have any words of advice to current pharmacy students?

A: As Shaquille O'Neal said, "Excellence is not a singular act." Success depends on habits; you are what you repeatedly do. Also, "learning is a repetitive process that occurs over time." It is a pleasure teaching students in pharmacy school - their background intellectual level is outstanding, but nothing takes the place of repetition. Sitting down and repeatedly studying is important, as this will increase the likelihood of retention. I repeatedly go over my notes before teaching to ensure that I am giving an accurate and updated lecture.

Q: If you could go back and choose another major (besides Pharmacology), which would you choose?

A: I would choose one of my hobbies: Meteorology. At home, I have a large collection of meteorology books and videos. In particular, I have always been interested in tornado formation. I would study it and try to improve warning systems so we can decrease the mortality that tornadoes cause.

Q: Who do you like better: Batman or Superman?

A: Obviously being familiar with both fictional characters, I prefer Batman. The underlying persona is at least human – he has to learn, hone his skills, design creative "gadgets," and use psychological techniques to fight crime. At some level, it is something we all can relate to. Superman has powers like X-ray vision, flying, and tremendous strength. Sure, we can marvel at his abilities, but he is not relatable. We can relate more to Batman.

Q: We all know of famous scientists whose names are engraved in history: Einstein, Edison, Newton. Who is your scientific hero?

A: My father. He is the one that taught me how to look up things in dictionaries and encyclopedias. I had limited knowledge and many questions when I was younger; so, my dad would encourage me to read and derive answers for myself. He placed an emphasis on reading and talking to other people to obtain answers. But he also made it a point to tell me not to believe something because it was spoken by a famous person or found in any book or journal. He taught me another important mindset: people are people, and never believe something someone says about another group. Do not accept stereotypes because one person does not represent the whole of the group. This taught me not to be prejudiced and seek out answers that are based on reason.

FINDING YOUR NICHE IN PHARMACY

by Nandini Puranprashad

As primary advocates of patient care, student pharmacists and pharmacists are well on their way in changing the public's impression of us staying behind the counter at the corner drugstore doing nothing but "counting, licking, and sticking." It is time to step out of the classroom and from behind the counters - you must see what the pharmacy world has to offer!

So, what are your choices? Well, the next generation has a plethora of career paths to choose from. You will be surprised with what opportunities exist for PharmD graduates. While community (or "retail") practice has been the dominating career path, the reality is that pharmacists play critical roles in many other areas related to health care. How about careers in information technology companies, government and regulatory bodies, ambulatory clinics, the pharmaceutical industry, public health, managed care, law, and inpatient institutions (hospitals)? The list goes on.

"Pharmacists can be found in virtually every aspect of health care."

An exciting new field that has seen recent growth (and is a great way to practice clinical pharmacy) is specialty pharmacy practice. This field will continue to develop as new products such as biotechnology/biotech medications (e.g. monoclonal antibodies) arrive into the market. Biotech products typically require clinical management due to more rigorous FDA regulations. The FDA and biotech pharmaceutical manufacturers mandate clinical programs such as Medication Therapy Management (MTM) and Risk Evaluation and Mitigation Strategies (REMS). Therefore, pharmacists who practice in this area essentially become specialists in disease state management and cutting-edge biotech products.

A career path in managed care allows a pharmacist to work in mail order pharmacies, where he or she reviews drug utilization, counsels physicians on appropriate use of medications, or negotiates formularies. Pharmacists are also employed by health maintenance organizations (HMOs), pharmacy benefit managers (PBMs), and insurance companies.

The pharmaceutical industry is another option. Manufacturers employ many pharmacists to conduct research and develop new compounds. Pharmacists also act as medical science liaisons by communicating specific drug information to a variety of health care providers.

If you thirst for a broader role, consider a career in public health by joining the US Public Health Service (USPHS). This offers jobs in advanced pharmacy practice, health policy development, emergency and humanitarian responses, public health leadership, global health, and much more. As part of the USPHS, you will be able to work for the Food and Drug Administration (FDA), Health Resource and Services Administration (HRSA), Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), and a variety of other organizations.

Community pharmacy is also exciting because of increased patient care initiatives and pharmacists' involvement in patients' health. National giants (Walgreens, CVS, and Rite Aid) have increased their priorities in delivering services through individualized patient care programs. These programs primarily involve MTM, which increases patients' disease state awareness and medication adherence, as well as promotes cost-effective generic medications.

To conclude, one of my professors asked me to imagine a pharmacy environment in which everything is perfect. I am sure we have passionate thoughts on what changes we would like to see in pharmacy. My advice to you is to let those thought-provoking ideas guide and shape your career paths and drive you to create this utopian dream. Whatever career path you choose, I hope it is fulfilling and rewarding.

PUZZLE: CROSSWORD

by Mahdiah Danesh Yazdi



Stumped? The solution is available on page 25.

Across

3. Cardura
6. Commonly used loop diuretic
7. Often used for acute angina
8. First statin drug to find wide clinical use
12. Oral direct thrombin inhibitor
13. Altace active metabolite
16. First line thiazide diuretic
17. Anticoagulant with 4-hydroxycoumarin group
18. Cardiac glycoside derived from foxglove plant
19. Amlodipine + Benazepril
20. Low molecular weight heparin

Down

1. Commonly used selective beta 1 receptor blocker without ISA
2. Suffix indicative of the ARBs
4. Procordia
5. Class Ia antiarrhythmic
9. Class III antiarrhythmic which may cause hypo- or hyperthyroidism
10. Non-DHP calcium channel blocker
11. Simvastatin + Ezetimibe
14. Synthetic Factor Xa inhibitor
15. First ACEI developed

HAPPY HOLIDAYS AND BEST WISHES FOR 2012!

by Ebey P. Soman

Dear Sir or Madam,

Christmas is just a few days away, and an amazing year of great challenges, pleasant surprises, and endeavors is coming to a close. From working on Drugs & Diseases courses to simply having the privilege of being part of the profession at the White Coat Ceremony, students have endured much and achieved more than what was expected. Of course, we cannot forget to mention our faculty members, professors, teaching fellows, and administrative staff who toiled (without ceasing) to provide us unforgettable learning experiences this past year.

So on behalf of the entire Rho Chi Post editorial staff, I have the pleasure, nay the privilege, to wish our readers – the Faculty Members, Professors, Guest Authors, Pharmacists, University Staff, and last but not least, the Student Body – a Merry Christmas, a beautiful festival of rededication (Hänukkāh), a plentiful celebration of the harvest with Kwanzaa, and a blessed New Year.

I wish to offer some tips that will make the holidays full of merriment and ensure a healthy celebration. The holidays, especially Christmas, are filled with gifts; so, early preparation is important if you want to avoid last-minute stress during the holiday rush. Children should be given age-appropriate toys as gifts, and these should only be from appropriate vendors (to avoid lead contamination or other hazardous conditions). It is very important that everyone in the home gets plenty of rest in between the festivities to avoid sickness.

The birth of Jesus Christ is a reason to be merry, but that does not mean it should warrant excessive consumption of alcohol. Please watch your alcohol intake, and have a designated (sober) driver, even it is just a “few drinks.” At parties, eat healthy foods, such as fruits and vegetables, and avoid eating the junk foods loaded with sodium and fat. Remember to stay hydrated with plenty of water, and keep in mind that nothing beats a cup of hot chocolate during a frosty day!

It is also important to slow down a little when everyone else around you seems to be in a rush to get elsewhere. How about a walk in the park with a friend -or- fox-trot across the room with your partner? These small things help you get the 30 minutes of exercise needed to maintain a healthy lifestyle. Stubbing out your cigarettes and eating foods with plenty of omega-3 fatty acids (e.g. fish) is another great idea.

For some, the holidays may not be filled with merriment. The key thing to remember is that it does not matter how expensive or how big your gift is; it is the meaning behind that gift – the fact that you considered the other person when you bought it. So do not overcharge your credit cards or be burdened with the season; instead, being simple can have its rewards, as well. In addition, GriefShare (grief recovery support groups) programs held in many community centers and churches are a good way to deal with the loss of a loved one. Perhaps you can visit their graves, lay some flowers, or play a favorite musical melody of your loved one to remember their love and joy.

And finally, be yourself! The purpose of the season is not to pretend to be someone you are not or be anxious around other people. So, rejoice, relax, and be thankful for this year. Be thankful for the good and the bad, and look forward to a new year filled with new adventures, joy, and peace.

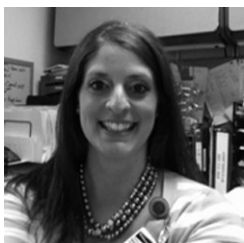
Once again, we wish you Happy Holidays. May your Christmas be jolly, your Hänukkāh full of light, and your Kwanzaa bountiful. May the New Year be a year of more blessings in your life and a year of greater achievements and milestones. We look forward to hearing your feedback, publishing your article submissions, and seeing all of you next year.

On behalf of the Editorial Team and Sincerely,

Ebey P. Soman

INTERVIEW WITH DR. ELIZABETH PALILLO

by Mahdiah Danesh Yazdi



Dr. Elizabeth Palillo graduated from the University of Connecticut in 2006. She then worked as a manager at CVS for a year and a half, and eventually moved to New York, where she worked at two other CVS stores. Dr. Palillo then left CVS and joined Bronx-Lebanon Hospital as a staff pharmacist, where she became IV room manager after six months. She left that position and began working at Beth Israel Medical Center in June of 2010. Dr. Palillo is currently a clinical pharmacy manager at Beth Israel Medical Center. She also serves as the residency program contact and the pharmacy ambassador.

Q: Please describe the residency program at BIMC.

A: We have four positions every year. The program has been in existence for about 15 years or so at least; so, it is an established program. I am the critical care preceptor, as well as the overall program contact. We have four faculty members from St. John's University and one faculty member Touro College. Dr. Cohen just joined the emergency department; so, starting next year's residency, she will be taking residents. Lina [Ngai] (clinical pharmacy manager), I, and others are preceptors. We have an ambulatory care practice, oncology ambulatory care practice, ambulatory care practice through our HIV clinic over at St. Luke's-Roosevelt (SLR), and then we have the standard inpatient floors: infectious diseases, general medicine, and critical care units: pediatrics, MICU, NICU, and basically everything else you can think of.

Q: What rotations do the residents have to do? What are their core rotations and what are their elective rotations?

A: Our core rotations are family medicine, one critical care unit, pediatrics, an infectious disease (ID) capacity or an antimicrobial stewardship, and one ambulatory rotation. Electives could be geriatrics, administration, and investigational drugs. Residents can repeat any previous rotation that they enjoyed, and can experience another critical care unit as an elective. Pain management / palliative care is also available as an elective.

Q: What is the responsibility of a pharmacy resident on the rotations?

A: It varies based on who the preceptor is. I can give you information specific to my rotation and in general. When pharmacy residents are on the floor, they are always with their preceptor or have their preceptor nearby to supervise. You round with the team; so, you are responsible for your pre-round on your patients, and need to be adequately prepared with all profiles and all drug problems before you even start. When you go on rounds with the team, you actively participate, make recommendations, and field questions from the team. Then, you would be responsible for following up with any issues that came up during rounds throughout the day. You are a liaison to the unit.

So, for example, Nicole Glasser is a resident currently on her surgical intensive care unit (SICU) rotation. We round in the morning, and she spends the rest of the day following-up on issues discussed in the morning and answering any questions that come up. The rest of the medical team reaches out to her, and she is responsible for answering their questions.

Q: The Beth Israel Medical Center residency program is known for having an extensive managerial portion. Can you please give us some details about this aspect of the residency?

A: The way we have set up our program is that we utilize our weekend staffing component and make it managerial. Our residents divide the weekends; we have four residents; so, each resident ends up working every fourth weekend.

For the first month or two, in July and August, two residents work on each weekend with a manager, and learn how to run the department. In September, we break it down to two residents each weekend. By October, or sooner if the residents are ready, one resident works solo. They are responsible for triaging every issue that comes up during the weekend: sick calls, doctors' questions, Pyxis problems, borrowing medications from other hospitals, approving non-formulary requests, and answering drug information questions.

Anything that comes up from Friday 9 PM to Monday 8 AM is the residents' responsibility. They have a pager, and can be paged by the staff. They always have a manager who works as their backup off-site. If they have any issues, they can call the back-up manager for help. But, really, they run the entire department. So, by the time they graduate, they would have had 10 months of solo experience and a full year of managerial experience, which is an experience most facilities do not offer.

Most institutions utilize the weekend for staffing; what we do instead is have them staff for four hours one night each week. ASHP requires some kind of service commitment as part of the program, as well. In order to be an effective clinical pharmacist you need to know the "nuts and bolts" of staffing and how things work. Our residents staff between 4 to 8 PM or 5 to 9 PM, depending on their rotation, one night per week.

Q: Beth Israel does not currently have a PGY-2 residency. Is the hospital considering a PGY-2 residency program?

A: Dr. See and the family medicine department are very interested in doing that. They have gotten as far as drafting proposals, and I believe that that is the most current level. It takes at least one year to go as an unaccredited program. So, you would have to pull in someone to do your program for a year, and then get accredited.

At this point, we are at least three years out before we have a PGY-2 program.

Q: Do you think that a residency is something that every pharmacy student should look into? How do you think it could impact one's career?

A: Yes, I do believe that it is something that every pharmacy student should consider. It should at least be something that they are informed about (to know exactly what it entails) so that they can make an informed decision. If they want to work in a hospital in any capacity, they should consider it. If they are interested in working outside of community pharmacy one day, even if not right away, they should consider it. Now, they even do community residencies, which make you a better community pharmacist.

So, all students should consider it. However, it is going to be competitive because there are not enough positions out there.

Q: Rho Chi recently hosted a mock residency interview event and students received interview feedback from several faculty members. What do you look for as an interviewer in an applicant? What would you suggest for underclassmen considering residency?

A: In as much control you have over your experiential rotation selection, select challenging rotations. I know you have core rotations and very little flexibility, but do not take the same rotation twice. I see many curriculum vitas (CVs) with two ambulatory care rotations or two internal medicine rotations or two general practice rotations. I want to see some specialty, oncology, or pediatrics. I want to see that you took the initiative to take something outside of the mandated list. If there is any way to get involved in research (and I know it is challenging as a student to shadow in a lab, do a poster presentation, or present a clinical pearl), experiences like that matter. Outside involvement is also important to me, as I want to see people who will give back to the profession and have other interests. I want them to show me that they can multi-task and have leadership qualities. Your interview will develop as your CV builds and you go on rotations. Much of the interview will be in the context of your CV, and you should be able to speak about your experiences. So, pick good rotations - try to have at least one major clinical rotation so that you can speak about journal clubs and case presentations and things of that sort. If you have not done any of those, it will be hard in the interview to show that you have clinical skills.

In terms of a future residency, I would tell students that studying is important but developing one's self is more pertinent. Your A's and 100's will not get you through an interview - you need to learn how to communicate. Time in pharmacy school should be spent expanding outside the books, learning how to communicate, involving yourself in activities, and networking because these are things that are going to get you through an interview. You may have a 4.0 on paper, but what is different about you? If you cannot speak to me, I am not going to want you as a resident. The only way to develop those kinds of skills is to spend time outside the school, even if it is just attending a professional event, or going on to the ASHP website and familiarizing yourself with professional developments. I believe these are the things that would set you apart.

Q: Finally, how do students apply for the Beth Israel residency program?

A: All ASHP accredited programs must have a set application process for students, which is available on the ASHP website. For our program, by January, you must submit: an essay stating your reasons for doing a residency, three letters of recommendation, your official transcript from school, and your professional CV. Those should be mailed to me by January 13th. Once we receive all the materials, we sort through them internally. We try to interview about 30 or so candidates, and this depends on the number of applicants. Last year, we had approximately 60 candidates.

We interview applicants within a two-week timeframe. An on-site interview is required for our program. In the end, through the Matching process, we make a list of people we are willing to take and submit it to ASHP (and the prospective resident does the same). ASHP takes both lists and favors the residents' choices.

For more residency information please visit: www.ashp.org

For information about the Beth Israel residency program, please visit:
http://www.wehealnewyork.org/professionals/bi_pharmresidency/program.html

HIV TRANSMITTED FROM A LIVING ORGAN DONOR: NYC, 2009

by Alisha Kumar, PharmD Candidate c/o 2012

HIV transmission via organ transplantation is rare in the United States. However, after a public health investigation in 2010, a case of HIV transmission via kidney transplantation was confirmed.

The kidney recipient had no history of sexually transmitted infections (STIs), injection drug use, sex with injection drug users, or other high-risk sexual activity. The recipient tested negative for HIV infection via serum enzyme immunoassay (EIA) pre-transplant day 12 and negative via serum nucleic acid test (NAT) pre-transplant day 11.

The donor underwent evaluation consistent with hospital protocol for determination of eligibility with immunologic compatibility with the recipient. His evaluation revealed a previous diagnosis of syphilis and history of intercourse with male partners. He tested negative for HIV infection via serum EIA pre-transplant day 79. He also tested negative for Hepatitis B infection by HBV surface antigen testing and negative for Hepatitis C via anti-HCV serology. A rapid plasma regain (RPR) test for syphilis was positive with a fluorescent treponemal antibody absorption (FTA-ABS) test, consistent with previous syphilis episode.

Post-transplantation, the recipient experienced complications including multiple hospitalizations for fevers, renal insufficiency, and evaluation for possible kidney transplant rejection. One year after the transplant, this patient was hospitalized for refractory oral and esophageal Candidiasis and was positive for HIV infection via EIA test. The donor was also tested one year after revealing positive HIV results via EIA confirmed by Western blot.

During the investigation, the donor reported unprotected sex with one male partner during the one year before the transplant. This time included the time between the initial evaluation and organ recovery period; therefore, it is unclear when the transmission took place. Moreover, post-transplant day 404, whole blood specimens were obtained from both donor and recipient for phylogenetic analysis at the CDC. The results revealed the two viruses as being highly related.

Conclusively, this documented case implicates a repeat test for HIV should be as close to the time of organ donation as possible, but no longer than 7 days. NAT availability now permits detection of HIV infection prior to antibody development and detectable by serology. The window with NAT (or the “eclipse period” for time from infection to detection of virus in blood) is estimated to be 8-10 days. Meanwhile, the window between time of HIV infection and time of development of detectable HIV-specific antibodies ranges from 3 to 8 weeks.

Therefore, the best option would be donor screening using a combination of HIV serology and NAT to rule out acute or recent HIV infection.

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DIFFERENCES BETWEEN ANTAGONISTS AND INVERSE AGONISTS

by Neal Shah

There are two major classifications of drug-receptor activity: agonism and antagonism. Agonism occurs when a molecule binds to a receptor, causes an exertion of normal receptor operation, and eventually causes a response. Antagonism of a receptor occurs when a molecule binds to the receptor and does not allow activity to occur.¹ Further divisions of these broad categories leads to a rich classification of molecular activity. **Figure 1** provides a short, albeit incomplete, pharmacologically-relevant classification of agonism and antagonism relevant to this discussion, with drug examples.

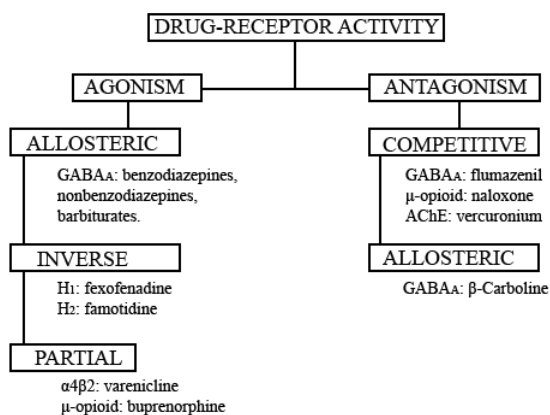
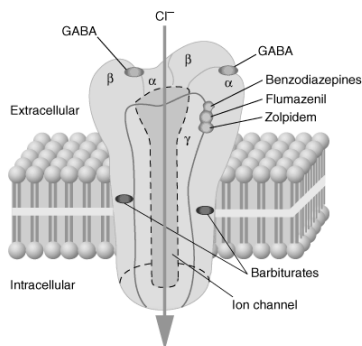


Figure 1.¹

Activation by benzodiazepines and barbiturates on GABA_A receptors occur on sites where the natural ligand GABA does not bind. Since they do not share the same receptor site as the endogenous substance, this is defined as allosteric activation.¹ Similarly, GABA_A is allosterically inhibited by β-carboline, and subsequently causes seizures.² **Figure 2** shows the GABA_A receptor binding pockets and drugs involved in activation.

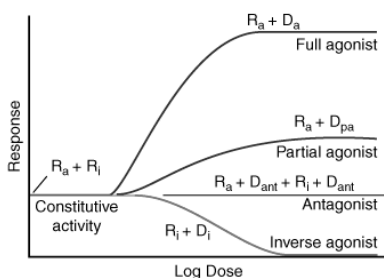


Source: Katzung BG, Masters SB, Trevor AJ: *Basic & Clinical Pharmacology*, 22th Edition.
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Figure 2.¹

Partial agonism by drugs like varenicline is helpful in overcoming addictive substances, such as nicotine (for smoking cessation). By providing a small release of dopamine in the mesolimbic region of the brain, nicotine withdrawal effects are diminished. An additive effect occurs when varenicline binds to the receptor, as it prevents nicotine from exerting its effect and makes smoking unnecessary.³ Similarly, buprenorphine partially activates the μ -opioid receptor, making opioid addiction treatment more tolerable and easier to overcome. Naloxone, a μ -opioid receptor antagonist, can be used to prevent abuse of buprenorphine.⁴ There are reports that naloxone may possess inverse agonist activity, as well.⁵

It should also be noted that antagonism is defined by some sources as “producing no effect when administered alone, but blocks the effects of agonists and inverse agonists.” This brings up a stimulating and difficult conceptual discussion as to how drugs are truly classified. For this definition to be true, it implies that some receptors are active at all times.⁶ If so, an antagonist would simply reduce receptor activity to a basal level. **Figure 3** displays receptor activities after binding of an agonist, a partial agonist, an antagonist, or an inverse agonist.



Source: Katzung BG, Masters SB, Trevor AJ: *Basic & Clinical Pharmacology*, 12th Edition.

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Figure 3.¹

For basal activity to occur, a small portion of receptors should be exhibiting some activity. There are receptors in the body that, in the absence of a ligand, exert an effect.⁷ These receptors respond to inverse agonists. When antagonists are administered, the receptors cannot exert any effect beyond its constitutive activity. Flexibility of receptor activity is preferred, rather than a traditional “on” or “off” receptor type that is commonly described. An analogy can also be drawn to a light switch and a dimmer switch. In this situation, the light switch is a receptor which can only exist in either an “on” or “off” state. When an agonist binds, an increase in the effect of the receptor is seen because it is in the “on” state, and when an antagonist is administered the receptor is in the “off” state so no effect is observed. An inverse agonist had no role in this situation.

On the other hand, constitutively-active receptors are more like dimmer switches: when an agonist is administered, the action a receptor exerts increases. When an inverse agonist is administered, effects seen would decrease from basal tones. Blood vessel activity is a physiological example of this analogy. Sympathetic innervations keep blood vessels partially constricted, representing basal or constitutive tone. Increases of sympathetic mediators act as full or partial agonists in **Figure 3**, constricting blood vessels further. Decreases in concentrations of the mediators would lead to vasodilation, represented by inverse agonists in **Figure 3**.⁸

Other pharmacologic examples are seen in the case of β_1 receptors on cardiac tissues. β_1 receptors have constitutive activity.^{9,10} Blocking β_1 receptors with a competitive antagonist should not exert any effect, as per **Figure 3**. However, β_1 blockers like nebivolol, carvedilol and bisoprolol—traditionally classified as competitive antagonists—cause bradycardia, thus exerting inverse agonist activity in human ventricular muscle.¹¹⁻¹⁴ Upon discontinuation, exacerbation of β_1 activity—termed as beta blocker withdrawal—is seen due to up-regulation of β_1 receptors.

Another pharmacologic example of inverse agonists includes H_1 anti-histamines. Histamine is a crucial endogenous transmitter in the body, mediating wakefulness and cognitive ability, modulating appetite and maturation of immune cells, and participating in other physiologic processes.¹⁵ Histamine also mediates allergic responses to antigens, causing traditional urticaria, pruritis, and anaphylactic reactions (such as difficulty breathing and hypotension).¹⁶ Histamine can also increase secretions of gastric acid, leading to gastroesophageal reflux disease (GERD).¹⁷ Thus, histaminic receptors are constitutively active, and the H_1 anti-histamine agents are rightfully termed “inverse agonists” instead of “competitive antagonists”.¹⁸

Diphenhydramine is a first-generation H_1 anti-histamine that acts as an inverse agonist at H_1 receptors.¹⁹ It penetrates through the blood brain barrier, but it is not a substrate for the P-glycoprotein efflux pump. Inhibition of central histamine receptors causes the traditional sedative side effect, and it is for this reason that diphenhydramine is FDA approved for mild insomnia.²⁰ It is also widely used to suppress allergic reactions. The desire to create an anti-histamine agent that did not cause sedation lead to fexofenadine. Fexofenadine is a second generation H_1 anti-histamine that decreases allergic reactions mediated by histamine by acting as an inverse agonist to H_1 receptors, similar to diphenhydramine. However, it is a P-glycoprotein substrate; so, if it does cross the blood brain barrier, it is pumped back out.^{21,22} This allows the same effects as diphenhydramine in terms of allergic reactions, but without sedative effects.

The H_2 anti-histamine drug famotidine follows the same concept as its H_1 anti-histamine relatives. By decreasing basal/nocturnal secretions and large volumes of gastric acid, it can help with short term heartburn and gastroesophageal reflux disease treatments.²³ Besides H_1 and H_2 inverse agonists, there is ongoing research on H_3 and H_4 receptors to treat neurological disorders. An H_3 receptor inverse agonist known as pitolisant has been shown to increase alertness, and may prove beneficial for dementias, schizophrenia, or attention deficit hyperactivity disorder.²⁴

Cannabinoid receptors, like histamine receptors, mediate appetite. Agonists, such as dronabinol, are used last-line in wasting diseases like cachexia.²⁵ Cannabinoid agonists also have deleterious bone effects, and have been linked to impaired bone formation via the CB2 receptor.²⁶ Inverse agonism of CB1 receptors in the central nervous system (CNS) and peripheral tissues suppresses food intake and promotes weight loss.²⁷ A drug known as rimonabant has been developed as a CB1 inverse agonist; it is an anti-obesity agent for this reason.²⁸ Cannabinoid receptors, again like histamine receptors, also modulate attentiveness. Rimonabant has been proven to increase cognitive ability, and may also be used for Parkinsonian disease states.²⁹ CB2 inverse agonists are used to decrease bone loss by inhibition of osteoclastogenesis.^{30,31}

The 5HT_{2A} receptor has been implicated heavily in the psychosis model. Atypical antipsychotics act as inverse agonists of 5HT_{2A}, and additionally act as inverse agonists at the 5HT_{2C} receptor.³² A new 5HT_{2A} inverse agonist, pimavanserin, acts to help with Parkinson's disease psychosis where atypical antipsychotics may be contraindicated. It successfully reduced psychosis without causing significant decline in motor function in a small clinical trial conducted by Vanderbilt University.³³ It is also being investigated for insomnia.³⁵

In conclusion, inverse agonism is wholly different than antagonism. Whereas antagonism will return a receptor back to its **basal** activity, inverse agonism will **depress** receptor activity - thus

providing advantages in pathological states of receptor hyperactivity. Currently, inverse agonists are commonly used for sedation and seizure control (with benzodiazepines) and allergic reactions (with anti-histamines). With further investigations, there will be increased utilization of inverse agonists.

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STUDENT PHARMACIST STAR OF THE MONTH: JENA MARION

by Marie E. Huang



Each month, Rho Chi Post editors have the wonderful opportunity to sit down with an inspiring leader among the student pharmacists here at St. John's University – someone who is not afraid to stand apart from the crowd and can be the change he or she wants to see in the world. This December, Jena Marion, a 5th year PharmD candidate and previous American Pharmacists Association - Academy of Student Pharmacists (APhA-ASP) Regional Member-at-Large, talks about networking techniques, advocacy, and the importance of time management.

Q: You have quite the impressive run! Tell me something about the projects you are currently working on. What is your secret?

A: I have always believed that being involved in professional organizations is critical for student pharmacists as they go on to become competent and professionally-aware pharmacists; and for that reason, I have made my involvement in organizations (such as APhA-ASP, LKS, and PLS) a priority. While one's in-class education is crucial to his or her path in becoming a pharmacist, there are so many things that simply cannot be taught in a lecture or a laboratory. Everything that I have learned from my participation, leadership positions, and experiences will come into play in the future and help make me a better pharmacist. At a recent California Pharmacists Association meeting, a pharmacy leader urged students: "Don't let pharmacy school get in the way of your pharmacy education," and there are few quotes that resonate with me more about my time here as a student pharmacist.

Q: You seem really close to those you network with "on the field" at fairs / conventions / meetings. One of our readers wanted to know how you find that natural connection with others. Networking itself is known to be very formal, especially since you are interacting with people who can help you professionally. How are you able to take that to a new level and develop a great friendship with the people you encounter?

A: Networking is actually one of my favorite things about pharmacy school, along with attending different meetings and conventions. I love speaking with people and hearing about their experiences in their field, as well as the paths they walked to arrive where they are today. Pharmacists and student pharmacists alike often have truly interesting and inspiring stories. And on that same note, I love sharing my experiences and some of the things that I have learned with my fellow students.

However, networking can definitely be intimidating! Try starting out by speaking about things that you are interested in. For example, I love social media and use Facebook and Twitter to share different articles I read regarding the profession of pharmacy. When I spoke with the pharmacists representing PSSNY and LIPS at Pharmacy Organization Day last month, we spoke about how the organization could use social media to reach out to

and engage student pharmacists. Following up with your contacts is also really important! Even a simple email to a student pharmacist you met at a recent conference could keep the lines of communication open from year to year. Another tip is to practice your “elevator speech” - being able to tell people you meet a little bit about yourself in 30-60 seconds will not only make you memorable, but will often prompt people to want to know more about you. Finally, practice makes perfect! Between national, regional, and campus-wide events, there are new opportunities each week to practice your people skills and make new contacts in your professional network.

Q: What are you looking to do after graduation? Would you be interested in working full-time for a professional pharmacy advocacy organization?

A: After graduation, I am hoping to complete a community pharmacy practice residency that will help me refine my patient care and communication skills, work towards becoming a preceptor, and obtain a teaching certification. Down the road, I would like to work as a pharmacist in the community setting, teach at a local university, and precept advanced pharmacy practice experience (APPE) rotation students. While the thought of being involved in professional organizations full-time and getting paid to do so would be a dream come true, I also would find it hard to lose the connections that I have with my patients. One of the best things about being involved in professional organizations in college is seeing how they can grow with you as you become a new practitioner and a pharmacist. There are continuous opportunities for involvement and leadership far into the future of your career, and with the many disciplines across the field of pharmacy, there is no telling where each of us may end up in the future.

Q: It appears as you have paved the road for yourself already! According to one of our readers, the American Medical Association (AMA) is the largest association of physicians and medical students that can rightfully claim that they unite and represent a whole profession. In your opinion, is APhA playing a role similar to what the AMA plays for physicians?

A: That is a great question! I think that, first and foremost, pharmacists and student pharmacists need to realize what APhA is, and what it is not. It can advocate for the profession of pharmacy, unite the voices of pharmacists and student pharmacists across the country (and in all fields of discipline), and guide the profession as we move into the future. It can lobby for certain laws, but it cannot make laws, enforce laws, or mandate any position it supports. Once we realize that, we can look at how APhA compares to organizations like the AMA. According to the Bureau of Labor Statistics, there were nearly 270,000 pharmacists working in the US in 2008, yet APhA reports around 60,000 members. This means that only about 22% of pharmacists belong to the oldest and largest professional organization here to represent them. And in my opinion, that is where the problem lies. APhA and APhA-ASP can only operate with the membership and participation of the professionals that it represents. Membership pays for itself, and it opens so many doors to learn, educate others, network, travel, and have fun, too! APhA definitely mirrors the AMA in its mission, vision, and day-to-day activities - but it is now up to pharmacists and student pharmacists to support that.

Q: As last term's APhA-ASP Member-at-Large of our region, I can only imagine how hectic the workload must have been. What were your duties and responsibilities? More importantly, how did you manage your time wisely during the semester? Could you offer us any specific tips?

A: My position as APhA-ASP Region I Member-at-Large allowed me to work closely with the Regional Delegate and the Midyear Regional Meeting Coordinator to help promote membership, Patient Care Projects, and the International Pharmaceutical Students Federation (IPSF) to student pharmacists across our region. I worked to coordinate the regional newsletter (we published three issues last year), and I had duties at the Annual Meeting (serving on the APhA-ASP Reference Committee and taking notes during the Open Policy Forum), as well as the Midyear Regional Meeting (as recording secretary at the Closing Business Session). Finally, I served as a resource to chapter officers and helped to answer questions about planning events, writing Chapter Achievement Award Reports, and promoting attendance at the various meetings throughout the year.

Although it seems like a lot of work, my day-to-day responsibilities were not too demanding, and I had the incredible support of my fellow regional officers (as well as APhA Staff) to ensure that things ran smoothly. It was truly an honor to be able to serve my region in this capacity, and was one of the most challenging, and rewarding, experiences I've had in my education so far.

I credit early involvement with the time management skills I learned while at St. John's University. I became actively involved in two professional organizations during the Fall semester of my freshman year, and I learned to adjust to commuting to school and adapting to different teaching styles while learning the "ins and outs" of student leadership on campus. The truth is that school is not my number one priority 100% of the time. Each week presents different activities and challenges for me; I have to ensure that my assignments are completed and that I am on track with my studying. However, I believe that it is pertinent to maintain a balance - some days, studying takes precedence; other days, I might put schoolwork off for a day to catch up on emails and extracurricular items. And some days, still, a few hours of relaxation or a mental health day will leave me refreshed enough to return to work.

Essentially, the key is to become a well-rounded pharmacist after graduation.

Q: I am certain that many pre-professional students would find your advice useful, especially when they reach their professional years. And now for our most important question yet: Superman or Batman?

A: Batman - I am a sucker for sports cars!

Q: Thanks for sitting down with us! It has been a pleasure. Do you have any last words for our readers?

A: Yes. Pharmacy school is tough. Class schedules, labs, and examinations can be downright exhausting, especially because many of us have work and rotations in conjunction. Regardless of what organizations you involve yourself with and career path you choose to take in the future, please make sure you are passionate about what you do. There are endless

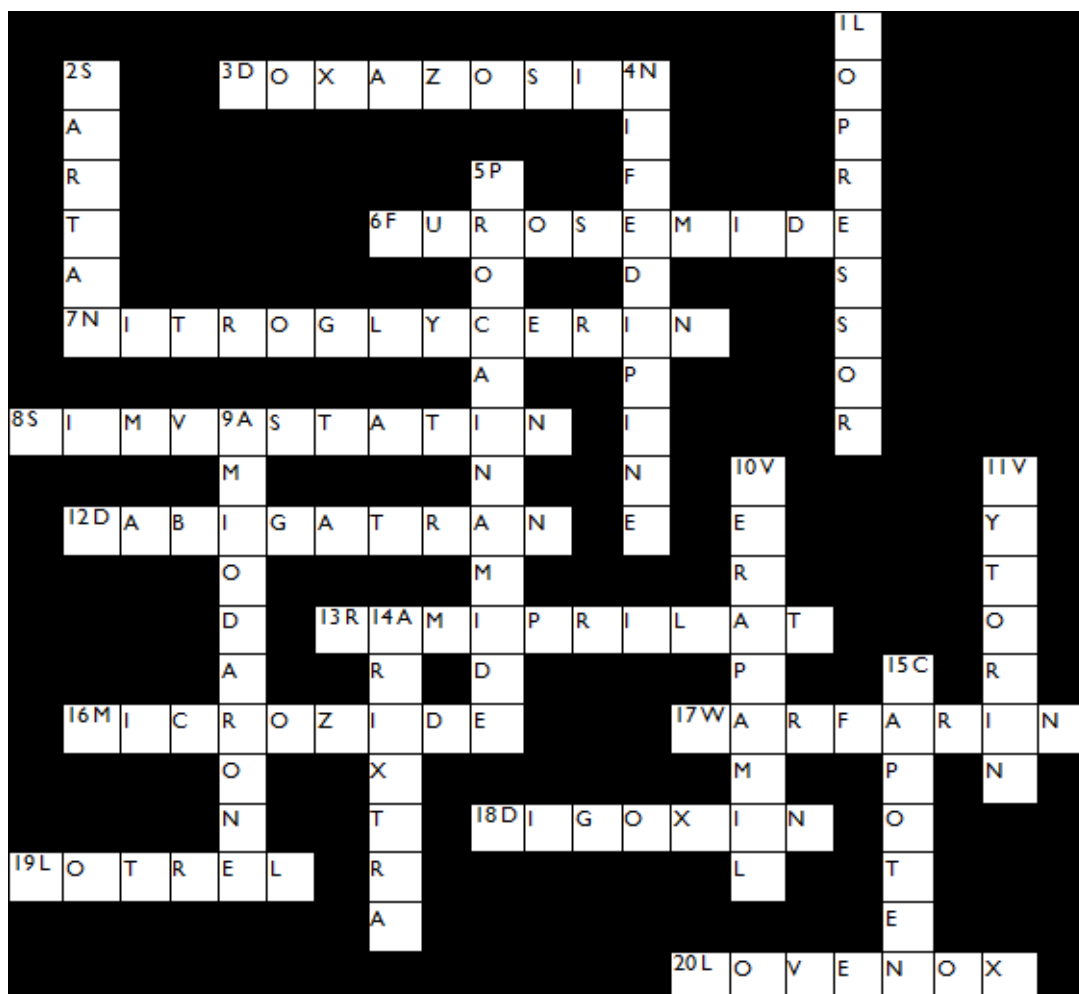
possibilities for a future when you have a PharmD degree, and as Confucius said, “Choose a job you love, and you will never have to work a day in your life.”

Additional questions for Ms. Marion can be directed to jena.marion07@stjohns.edu.

Know an influential colleague with extraordinary accomplishments?
Tell us at rhochis@gmail.com!

PUZZLE: CROSSWORD (SOLUTION)

by Mahdiah Danesh Yazdi



FEDERAL GOVERNMENT TO ATTEMPT LIMITING DRUG SHORTAGES

by Mahdiah Danesh Yazdi, with special thanks to Dr. Tomasz Jodlowski

Drug shortages have plagued health care institutions in recent years; they present a serious problem to health care delivery on a national scale. In 2004, there were 58 drug shortages; now, in 2011, this number has increased to 198. Due to limited access to the most effective drugs for their illnesses, patients experienced negative effects and decreased quality of care. Vital chemotherapy drugs, such as leucovorin, cytarabine, methotrexate, paclitaxel, bleomycin, vincristine, daunorubicin, and doxorubicin are in short supply. Important analgesics (such as fentanyl) and antibiotics (such as Amikacin) also fall under the umbrella of drug shortages. This issue not only compromises patient care, but may also increase medication errors. Recently, the legislative and executive branches took steps in an attempt to ameliorate this growing problem.

On February 7th of this year, Senator Amy Klobuchar (D-MN) introduced a bill in the Senate known as the Preserving Access to Life-Saving Medications Act (S.296). Subsequently, on June 21st, Representative DeGette (D-CO) sponsored the same bill in the House of Representatives (H.R. 2245). The bill requires manufacturers to alert the Secretary of Health and Human Services (HHS) about any upcoming drug shortages at least six months before the shortage is predicted to occur. If not possible, the manufacturer must provide a good reason for why they could not alert the federal authorities sooner or they will face penalties for violating the law. It also asks the Secretary of HHS to publish such notices on the FDA website (to inform health care professionals). The bill would also obligate the Secretary of HHS to inform drug manufacturers of drugs suspected to be in low supply, as well as to consult on methods to increase production of such drugs.

In the Senate, the bill has been referred to the Committee on Health, Education, Labor, and Pensions for review. In the House of Representatives, the bill was presented to the House Committee on Energy and Commerce, which then referred it to the subcommittee on Health (where it is currently under review).

In light of the extensive problems caused by drug shortages in recent years and the protracted legislative process, President Obama released an executive order addressing the issue on Monday, October 31st. In his executive order, President Obama addressed the potential causes of the shortages, and would like to resolve some of the problems that are within the authority of the federal government. While he did credit the Food and Drug Administration (FDA) with preventing 137 drug shortages last year through expedited review processes, he stressed further action. He attributes the cause of the drug shortages to demand that exceeds manufacturing capacity, along with inadequate dissemination of information to federal authorities and the public regarding shortages. The President specifically called attention to the shortage of certain cancer treatments.

The demand for these types of drugs has increased, while manufacturers' capacities to produce the drugs have lagged.

The president, therefore, instructed relevant authorities to make adjustments.

- The FDA should use its enforcement authority to ensure drug manufacturers timely-report terminations (of drug products that are “life supporting or sustaining, or that prevent debilitating disease”) to both federal agencies and the public. This would allow health care organizations and workers adequate time to plan for alternative treatments.
- The FDA should expedite reviews of suppliers and manufacturers as much as possible without compromising safety standards in cases which a drug shortage may be addressed or attenuated.
- The FDA should look at market behavior that may lead to amassing drugs or selling them at unreasonably high prices. The FDA is then obligated to report this to the Department of Justice (DOJ) which will pursue an investigation to determine whether any unlawful activity was involved.

It is hoped that both, the executive order and congressional action, will alleviate drug shortages. The American Society of Health-System Pharmacists (ASHP) supports the bill, and is working with both parties in the House of Representatives and the Senate to gain backing for it. There are also online petitions in support of the bill, which ask citizens to write letters to their congressional representatives. The coming months will reveal the effect of these actions.

In the meantime, health care professionals must work diligently to come up with alternative treatment plans to meet patients’ health demands.

For a current listing of drug shortages please visit:

<http://www.fda.gov/Drugs/DrugSafety/DrugShortages/ucm050792.htm>

-or-

<http://www.ashp.org/drugshortages/current>

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DRUG SHORTAGES: IMPACTS AND PREVENTION MEASURES

by Jimmy Johnson, PharmD Candidate c/o 2012



Drug shortages have become more and more of an issue in the health care industry. There are over 200 drugs on the Food and Drug Administration's (FDA) drug shortage list - a number that has tripled in the last five years.¹ The largest impact has been on anesthesia and oncology drugs. Injectable agents, such as propofol (a drug commonly used to induce anesthesia and sedation), are more likely to be in short supply because of the complexity in their production and storage, as well as their likelihood of contamination.² But who is to blame for the increase in drug shortages, and what can we do to resolve this situation?

First let us consider who benefits at a time of drug shortage. Contrary to popular belief, the drug manufacturers that normally supply these medications do not profit in these circumstances. Their goods are unable to be produced / sold, and profits stagnate. Small wholesalers, on the other hand, commonly practice price gouging. There have been instances where \$12 dollar leukemia drugs were sold for \$990 per vial.³ And if you think that is bad, well, it gets worse.

Most people have never heard of the term "grey market." This refers to the legal, yet questionable, practice of purchasing medications from unofficial and / or unoriginal sources. It has been associated with reports of dosage errors, improper storage, and drug counterfeiting. Although this seems unethical, it is what some institutions resorted to in order to obtain medications for their patients. However, drug shortages are not limited to hospitals - let us not forget that clinical research trials require medications to formulate guidelines and make recommendations for optimal treatments. The shortages can also extend to compounds in the pipeline (in development). Newer drugs are compared to drugs currently on the market to determine benefits versus the current standard of therapy.

The people who ultimately suffer the most are the patients. Some drugs on the shortage list can be therapeutically-substituted until more supplies come in. Alas, what about medications that cannot be so easily replaced? Patients undergoing chemotherapy treatments are on strict regimens with medications specific for the type of cancer they have. Is it fair to make them wait when every missed dose is a step closer to metastasis? When Hospira, the global market leader for generic injectable pharmaceuticals reported a shortage on Levophed®, intensive care units (ICUs) had to allocate their supplies to the most critical patients. And will giving everyone else a therapeutic substitute produce the same outcomes? In many of these situations, the answer is inevitably no.

On November 1st 2011, President Obama made an executive order in an attempt reduce the instances of these shortages. His plan includes "broadening reporting of potential shortages of certain prescription drugs, speeding up reviews of applications to begin or alter production of these drugs and providing more information to the Justice Department about possible instances of price gouging."³ Although it might not solve everything, it's a start.

So, what can manufacturers do? Communication seems to be a major factor in whether a drug shortage occurs or not. Logically, it would make sense for drug manufacturers to alert

the FDA that there may be some sort of problem with production or quality control, and that they may run low on supplies in the foreseeable future. Realistically, this does not always happen. There is currently no rule that forces manufacturers to alert the FDA about possible shortages (but it has been proposed). It is up to both the drug companies and the FDA to work together to establish better lines of communication. If this cooperation does not pan out, laws may be necessary to enforce better compliance from drug manufacturers to report this important information to the FDA. If so, the FDA would be able to respond by informing other drug manufacturers and asking them to prepare for the shortage (by increasing production of the scarce drug). Furthermore, this would allow alerts to be sent out to hospital pharmacists sooner, eventually leading to regulations on drug dispensing.

The FDA cannot force companies to produce more of a drug. It can, however, provide some sort of financial incentive, such as waiving certain fees. Largely, complaints from drug companies seem to be “regulatory compliance and product quality issues.”² Although drug manufacturers are trying to meet the FDA’s guidelines for good manufacturing practices (GMPs), remediation of a drug can cause significant delays in its production. However, this is not something that should be compromised. If the FDA finds an issue with the manufacturing process at a drug company, its actions serve to protect the patients.

As outlined in President Obama’s plan, the FDA could also expedite the review for a drug manufacturer who has altered the drug manufacturing process in order to meet good manufacturing practices (known as remediation). Remediation is where a lot of the delay in drug production occurs. Many manufacturing facilities are in India and China, and are making the review of these facilities more arduous and time consuming. According to an article in the New York Times, “nearly half of all shortages followed inspections that found serious quality problems, including injectables that had glass shards, metal filings, and bacterial and fungal contamination.”³ It is obvious that the FDA’s policies are there for good reason. The generic drug industry is working with the FDA by providing nearly \$300 million (annually) to hasten inspections and drug applications.

Finally, if the government can regulate price hikes for gasoline, then should it not do the same for life saving medications? Perhaps a law could be enacted to prevent price gouging by small wholesalers who take advantage of emergency situations like drug shortages.

All in all, resolving the increase in drug shortages is not something that can be done overnight. Neither is it something that can be fixed by the actions of the drug manufacturers alone. It will take a combined effort from both, the FDA and drug companies, to fend off the rising tide of drug shortages.

Only time will tell if these recommendations can make a difference in preventing future drug shortages.

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IVABRADINE: A NOVEL I_F BLOCKER FOR STABLE ANGINA

by Neal Shah

- Part I: Preface.
- Part II: Brief review of cardiac electrophysiology.
- Part III: Ivabradine as a novel I_f blocker for the use of stable angina.
- Part IV: On the horizon: trimetazidine.

PREFACE

When viewed anatomically, the heart may seem like a simple organ. However, the electrophysiological aspects of the heart are somewhat complex. As pharmacists, in part, we not only need to understand how drugs exert their actions in pathological settings, but also how they can interfere with normal physiological functions to create adverse effects. As researchers, we always strive to discover new pathways that have the potential to revolutionize current therapies or rekindle interests in old pathways to discover new effects. I have had a significant interest in cardiac physiology since my first course in Anatomy and Physiology years ago. In addition, I have read several books and papers dealing with the electrophysiological conductive system of the heart. I hope that readers of this article are familiar with the basics of cardiac conduction and terminology. If not, I have provided a review of pacemaker and ventricular electrical activity, as the drug discussed in Part III does not work by a commonly-known pathway.

There are at least five different types of calcium channels in human physiology: L-, N-, P/Q-, R-, and T-type channels.^{1,2} These voltage-gated channels are distributed throughout the body. N-type calcium channels in the nervous system are inhibited by drugs such as ziconotide (Prialt®), gabapentin (Neurontin®), and pregabalin (Lyrica®).³ These medications are used for intrathecal anesthesia or neuropathic pain.³ T-and-L-type calcium channels are discussed in Part II, and are targets in the treatment of absence (petit mal) seizures⁴ and cardiovascular diseases, respectively. P/Q-type channels are located in the Purkinje cells of the cerebellum, and R-type channels are also located in the brain and cerebellum, but will not be discussed here.⁵

Verapamil is a calcium channel blocker (CCB) that causes negative inotropy (a decrease in the force of contraction) and negative chronotropy (a decrease in heart rate). Since multiple calcium channel subtypes are present throughout the body, does verapamil exert its effects by blocking a single subtype of calcium channel? Or does it block multiple calcium channels? The answer may surprise you, as it did me. Its mechanism for causing bradycardia is different from ivabradine, which is discussed in Part III.

ELECTRICAL CONDUCTION AND EKG OF THE SINOATRIAL NODE

The sinoatrial (SA) node is commonly referred to as the “pacemaker” because, under normal physiological conditions, it has the most rapid rate of depolarization, and, thus, determines the heart rate. The SA node depolarizes rapidly because it possesses an interesting property: the pacemaker potential.⁶ The pacemaker potential allows the SA node to spontaneously depolarize due to a lack of stable resting membrane potential, thereby expressing autorhythmicity. This is due to the combination of the “funny channel” (I_f), and T-type Ca channels. The L-type channels also control SA depolarization, overall pacemaker activity, and excitation-contracting coupling in cardiac, smooth, and skeletal muscles.⁷ Figures 1 and 2 show the SA node’s electrical channel components. Figure 3 correlates SA node and EKG readings when negative chronotropy is induced.⁸

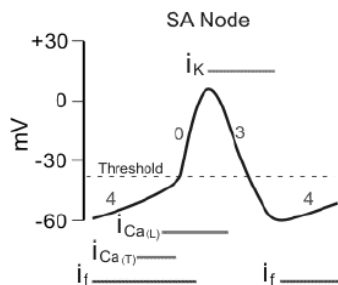


Figure 1

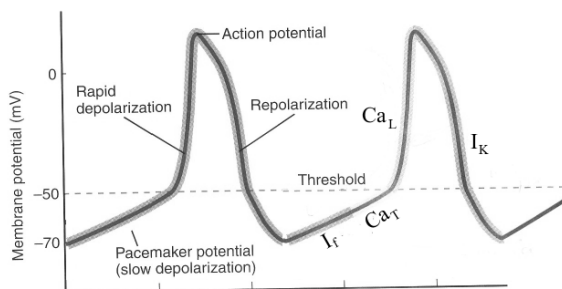


Figure 2

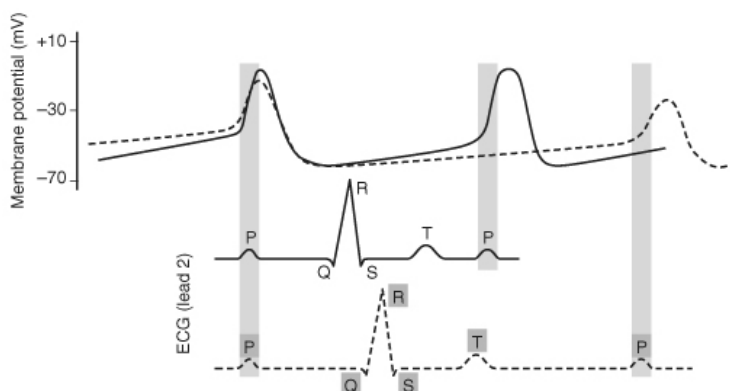


Figure 3

Legend for Figures 1-3:

- I_f – Na^+/K^+ “funny” channel.
- $I_{\text{CaT}}/\text{CaT}$ – T-type calcium channel.
- $I_{\text{CaL}}/\text{CaL}$ – L-type calcium channel.
- I_K – outward potassium rectifier.

It is interesting to note that the T-type calcium channel is involved in the pacemaker potential, whereas the L-type is involved in rapid depolarization activity. From Figures 1 and 3, we can infer that the L-type channel is most affected by traditional non-dihydropyridine (non-DHP) CCBs like verapamil—that is, verapamil is an L-type calcium channel blocker. Verapamil possesses T-type calcium channel blockade as well, but only a small fraction of its L-type channel blockade (and this inhibition does not contribute significantly to its negative chronotropy).^{9,10} Negative inotropy is not shown graphically, but is presumed to occur since L-type calcium channels control cardiac muscle contractions, and their blockade would decrease such activity. A potential target for drugs in the future should also focus on the T-type calcium channels in the heart, especially if molecular specificity against the brain’s T-type channels can be found. But the T-type calcium channel only controls the latter portion of the pacemaker potential, where blockade may prove unimportant if the first part is not first controlled.

This brings us to the I_f , otherwise known as the “funny” channel. I_f is an inward Na^+/K^+ current, activated by hyperpolarization of the membrane potential of the SA node.¹¹ The I_f channel dictates the slope of the pacemaker potential depolarization, and, thus, the rate at which the SA node fires action potentials. It is interesting to note that I_f is also inhibited by beta-adrenergic antagonists (such as propranolol or metoprolol), and this may contribute to their bradycardic effects.¹²

Angina is a cardiovascular disease where the heart's supply of oxygen cannot meet the oxygen demand of the heart. The goal of treatment is to restore the imbalance between oxygen supply and demand. Mitigation of angina can occur by decreasing heart rate, contractility, or increasing oxygen supply. Traditionally, angina has been pharmaceutically treated by use of nitrates, non-DHP CCBs, and beta blockers.¹³ However, these drugs do not act solely on the SA node and have adverse cardiovascular and non-cardiovascular side effects (such as insomnia and constipation).¹⁴ Therefore, it would be beneficial to have a specific I_f channel inhibitor - and ivabradine is currently the only drug to have this effect.

IVABRADINE

Ivabradine (Procoralan®, Servier) is a selective I_f channel inhibitor.^{11,12,15-18} It was internationally approved in 2005 for the treatment of stable angina, and is not currently available in the United States (US). Ivabradine inhibits the SA node's I_f current and induces negative chronotropy. Since ivabradine is selective for the I_f , it avoids the non-cardiac side effects of agents that can also block the I_f , like beta blockers. This is crucial in patients who cannot tolerate beta blocker therapy, such as those with uncontrolled asthmatic or peripheral vascular disease, or those who are sensitive to fatigue, depression, and sexual dysfunction.¹⁶ Unlike beta blockers, ivabradine selectively reduces heart rate without altering myocardial contractility, cardiac conduction, or coronary vascular tone.¹⁷

Interestingly, ivabradine's neutral inotropic effects were not initially seen in animal experiments. Ivabradine was shown to have positive inotropic activity, stemming from its bradycardic activity. A parallel can be drawn between ivabradine and digoxin in this sense, as they both decrease heart rate yet increase ventricular ejection. These positive inotropic effects were converted to negative inotropic effects in the additional presence of the verapamil, proving that calcium was the mediator for the effects.¹⁵ Unfortunately, ivabradine is not a true replacement for digoxin.

The INITIATIVE trial was a large multicenter trial in which 939 patients with stable angina were randomized to ivabradine or atenolol. Ivabradine, at doses of 5 and 7.5 mg twice daily, was shown to be at least as effective as atenolol 50 and 100 mg once daily, respectively.¹⁶ In another study, 120 patients were randomized to receive either ivabradine 15 mg or metoprolol 50 mg directly before coronary computed tomographic angiography. It was shown that although heart rate was greatly decreased compared to metoprolol, neither the systolic or the diastolic blood pressures were significantly affected.¹⁹ A smaller trial compared the effects of ivabradine and bisoprolol on exercise tolerance. Initially, both groups had a decreased resting heart rate; however, patients on ivabradine (but not those on bisoprolol) overcame exercise induced fatigue and tolerance.²⁰

It is possible that ivabradine may be used in patients that are intolerant of (or refractory to) beta adrenergic receptor antagonists or CCBs. For example, ivabradine normalized the heart rate of a patient presenting with heart failure induced by acute right ventricular pacing with a concomitant COPD exacerbation.²¹ It was reported that a hospitalized, 75-year old female presenting with severe acute angina and tachycardia did not respond to both IV diltiazem and propranolol. However, ivabradine (used off label in this emergency situation), upon titration from 2.5 mg twice a day to 5 mg twice a day, significantly reduced the heart rate and allowed the patient to be discharged one week later. Even after three months, this patient remained asymptomatic.²²

The BEAUTIFUL trial indicated that ivabradine may also possess beneficial cardiac effects. Ivabradine, at either 5 mg or 7.5 mg twice a day produced a slight increase in the left ventricular (LV) ejection fraction. This was believed to have resulted from reversing detrimental LV remodeling in patients with CAD and LV systolic dysfunction.²³ In the biggest trial of ivabradine to date (the SHIFT trial), ivabradine (in 793 out of an initial 3268 patients, 24.2%) produced a lowered heart rate with fewer adverse side effects.²⁴ The most common side effect was symptomatic bradycardia. Visual side effects, presenting as increased light sensitivity, were also reported, but these were transient.²⁵

Clinical trials are being conducted to determine if ivabradine can be used for other indications. One recent trial focused on using ivabradine in multi-organ dysfunction syndrome (MODS), where beta blockers have been shown to be efficacious but problematic, as they produced negative inotropism.²⁶

ON THE HORIZON: TRIMETAZIDINE

Data from clinical trials suggest that ivabradine is efficacious in treating angina. Another drug that has been available outside the US is trimetazidine (Vastarel MR®, Servier), which acts as a partial fatty oxidase (PFOX) inhibitor, forcing the heart to utilize glucose.²⁷ A similar mechanism was previously suggested for ranolazine (Ranexa®, Gilead), before it was known that it produced late sodium inhibition mechanism. However, a number of case reports indicated that trimetazidine produces extrapyramidal symptoms, which disappeared upon treatment discontinuation. This is likely due to the antagonism of striatal D₂ dopaminergic receptors, as this compound is a phenothiazine derivative (like the D₂ antagonist, chlorpromazine).²⁸

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STOOL TRANSPLANTS TO TREAT C. DIFFICILE INFECTIONS

by Ebey P. Soman

Many living organisms occupy our intestines to aid us with metabolism, recycling of hormones, and, most importantly, protection against foreign pathogens. When this normal flora of bacteria is altered or eliminated via antibiotic use, there is an opportunity for *Clostridium difficile* to infect us. Stool transplant, or fecal bacteriotherapy, is a procedure intended to replenish the normal flora of the colon in patients with pseudomembranous colitis caused by *C. difficile* or ulcerative colitis.

Patients with *C. difficile* infections are primarily treated with oral vancomycin (Vancocin®) or oral / intravenous metronidazole (Flagyl®). However, due to recurrent *C. difficile* infections and emerging resistance patterns, alternative therapies are under investigation. Stool transplan-

tation is an alternative treatment that restores the normal flora in the colon from stool donated from a healthy patient. The procedure has been used since the late 1950s and despite its initial misgivings, it may be safe to use. Alas, acceptability among the patient population may be a problem. Well-published guidelines and hospital compounding procedures are available; these help to provide and standardize a treatment protocol for this procedure.

Stool donated by a healthy person, such as a close family member or relative, is extensively tested to rule-out any pathogens. Tests include blood-borne pathogen exams that try to detect HIV, Hepatitis A/B/C, and other pathogens (e.g. *Treponema pallidum*, which can cause syphilis). The stool itself is tested for *C. difficile* cytotoxin, other entero-bacteria, and parasites. In some institutions, the patients may undergo *Helicobacter pylori* antibody testing as well.

When the donor and recipient “pass” their respective tests, the sample is collected and prepared as an enema according to pre-established institutional protocols. The stool is usually mixed with sodium chloride (saline) in a ratio specified by the hospital. Some institutions utilize 30 grams in 70 mL (42.8% w/v), while others may opt to use 50 grams of stool in 200 mL of saline (25% w/v). Before the prescription is compounded, the recipient receives antibiotics, such as oral vancomycin 500 mg twice per day for seven days (prior to fecal transplant with the last dose given the evening before the stool transplant). The patient also must consume four liters of polyethylene glycol-electrolyte solution (PEG-ES, such as GoLyteLy®) after treatment with vancomycin. The recipient is given oral loperamide (Imodium®) 4 mg followed by 2 mg after each loose stool to help with enema retention (for a maximum of 60 mg per day). Then, about 200 to 300 mL of the compounded enema is administered into the terminal ileum (retained for up to six hours per day) for a total of five days.

Recipients may also receive a nasogastric (NG) tube, which, upon insertion, must be radiographically confirmed. Oral vancomycin 500 mg is given twice per day about four days prior to the stool transplant, with the last dose given the evening before transplant. Oral esomeprazole (Nexium®) 20 mg is provided the evening before and the morning of the transplant. About 25 mL of stool suspension is then aspirated into a syringe and instilled into the NG tube. The NG tube is flushed with normal saline and eventually removed. Patients are encouraged to follow-up within two to four weeks, and can resume a normal diet and eating habits during this period.

Overall, with this procedure, many patients have experienced vast improvements in their conditions. The lack of complete evidence and the inability to ensure the safety of the stool makes stool transplantation a last-line therapy consideration. Despite the initial repulsion and invasiveness of the procedure, long-lasting relief can be achieved in patients with extremely recurrent *C. difficile* infections.

I would like thank to Mr. Jeff Huffman, Clinical Pharmacy Specialist for Infectious Diseases at Freeman Health Systems in Joplin, MO for providing his institution's guidelines for this procedure (via the ACCP Infectious Diseases PRN list).

SOURCES

- Aas J, Gessert CE, Bakken JS. Recurrent *Clostridium difficile* colitis: case series involving 18 patients treated with donor stool administered via a nasogastric tube. *Clin Infect Dis*. 2003 Mar 1;36(5):580-5.
- Silverman MS, Davis I, Pillai DR. Success of self-administered home fecal transplantation for chronic *Clostridium difficile* infection. *Clin Gastroenterol Hepatol*. 2010 May;8(5):471-3.

PUZZLE: WORD SEARCH

by Marie E. Huang

A	E	N	N	E	T	D	B	I	E	O	C	T	U
M	E	N	D	D	N	A	E	L	D	R	O	I	E
I	N	E	I	I	C	I	O	T	N	N	I	E	B
I	I	A	T	M	C	Z	D	D	B	E	E	N	C
B	D	Z	P	A	A	Y	D	I	C	L	O	R	L
I	I	D	E	R	F	L	C	T	T	L	I	E	O
S	T	M	P	P	E	L	A	L	E	I	R	A	D
A	E	E	L	O	D	P	A	S	O	A	N	M	L
C	M	D	T	L	O	M	I	R	E	M	D	A	M
O	I	A	R	C	O	C	I	T	C	M	I	D	R
D	C	M	T	O	O	I	I	T	A	U	T	N	O
Y	I	T	A	T	S	I	L	R	O	N	S	E	E
L	E	O	L	E	A	C	M	M	T	L	T	E	A
R	C	P	E	M	I	F	E	R	M	A	E	L	S

FIND THE FOLLOWING WORDS:

ORLISTAT
RANITIDINE
METOCLOPRAMIDE
DICYCLOMINE
OMEPRAZOLE
BISACODYL
CIMETIDINE
APREPITANT
SUCRALFATE
MESALAMINE

NOTICE A THEME?

ABOUT US

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.

UPCOMING EVENTS

Dec. 1st: PharmFLIX Submission Deadline (11:59pm)
Dec. 2nd: Patient Counseling Competition (TBA)
Dec. 4th-8th: ASHP Midyear Clinical Meeting (NOLA)
Dec. 12th-16th: Final Examinations (N/A)
Dec. 19th: Competency Examination (TBA)

CURRENT EXECUTIVE BOARD



Pictured above (left to right): Tawfeek, Shannon, Nandini, Mohamed, and Lila at the 2011 Induction Ceremony.

President: Mohamed J. Dungersi
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MEET THE STUDENT EDITORS



My name is Mohammad A. Rattu, and I am a 6th year PharmD candidate at St. John's University. I have had profound experiences with media-related positions in pharmacy organizations at our university, and continue to support the utilization of technology to further our profession. As the first Editor-in-Chief of Rho Chi Post, I hope to instill motivation and leadership in our student body. Feel free to get in touch with me at: mohammad.rattu06@stjohns.edu



My name is Mahdieh Danesh Yazdi, and I am a 5th year PharmD candidate at St. John's University. I like to stay current with all the changes in our profession, both legal and clinical. I hope to keep you informed with all that I learn. Please enjoy Rho Chi Post, and provide us detailed feedback so that we may improve our newsletter. If you have any questions or concerns, you can reach me at: mahdieh.daneshyazdi07@stjohns.edu



My name is Marie Huang, and I am a 5th year PharmD candidate at St. John's University. I am in a continuous process of self-definition, and constantly testing the boundaries of this world. I enjoy channeling my inspiration through words and photographs. As a student editor and a witness to an evolving profession, I look forward to keeping you updated! Who knows where we will be tomorrow? If you'd like, you can reach me at: mary.huang07@stjohns.edu



My name is Neal Shah, and I am a 5th year PharmD candidate at St. John's University. I frequently assist several professors on campus with their research. My goal is to provide my fellow students with research-based information that correlates with clinical pharmacotherapy. If you have any topics of interest or comments on published articles, please do not hesitate to email me at: neal.shah07@stjohns.edu



My name is Ebey P. Soman, and I am a 5th year PharmD candidate at St. John's University. I enjoy writing very opinionated articles, and am excited to be an editor of Rho Chi Post. I encourage all readers of our newsletter (students, faculty, professionals) to respond with their own literary pieces. I look forward to hearing from you, and welcome your comments and constructive criticisms: ebey.soman07@stjohns.edu



My name is Carina Fung, and I am a 6th year PharmD candidate at St. John's University and Rho Chi's 2010 past Vice-President. Over the course of my academic and professional career, I aspire to discover, learn, hone, and embody the qualities that make up a true and trustworthy health care professional with integrity and further the profession of pharmacy. You can contact me at: carina.fung06@stjohns.edu

ATTENTION!

This newsletter is distributed to all undergraduate student pharmacists and faculty members. All of us are interested in hearing from you. Pass the word along. Send us an email at rhochis@gmail.com with any items you would like to see in upcoming issues.
