St. John's University - College of Pharmacy & Health Sciences

RHO PX CHI post

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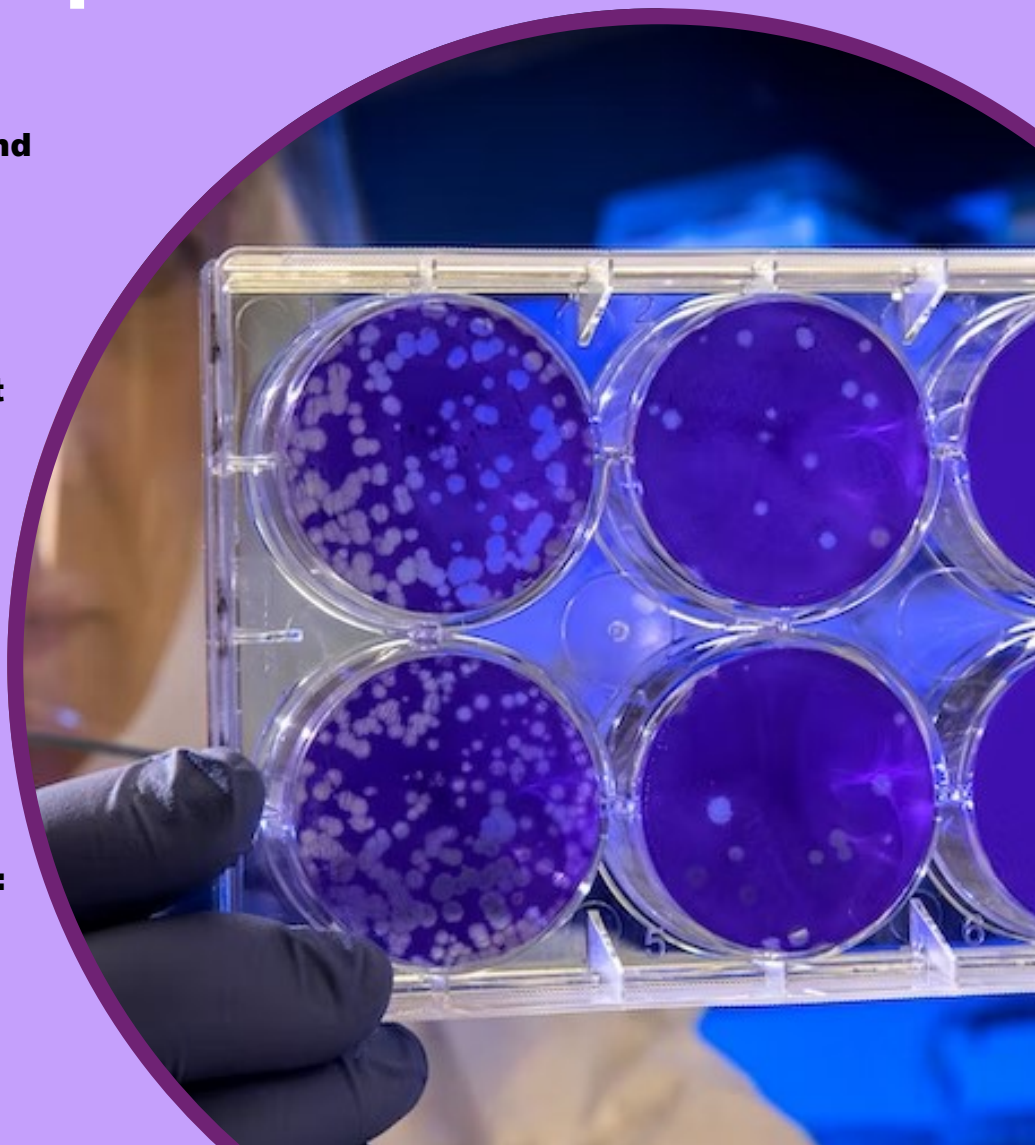
Balancing Early and Appropriate Antibiotic Therapy and Antimicrobial Stewardship Efforts in Sepsis and Septic Shock



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A Message from the Editor-in-Chief

This academic year, I have the pleasure of taking on the role of Editor-in-Chief for the Rho Chi Post. Our editorial team is made up almost entirely of new talent, and I'm excited to see how each member will carry out the legacy and mission of our organization. We are proud to present our first issue of the 2022-2023 academic school year that includes a total of seven articles, featuring faculty and student interviews and a variety of clinical articles. Additionally, we look forward to hosting an array of events in collaboration with the Rho Chi Beta Delta Chapter to promote scholastic excellence within our student body. As the fall semester unravels, we would like to wish all students a successful semester as they embrace new challenges and embark on their studies.

Frequently Asked Questions

Who can write for the Rho Chi Post?

Anyone can write for the Rho Chi Post! Our newsletter is not exclusive to St. John's University students. The Rho Chi Post accepts articles on a daily basis!

How do I submit an article?

You can submit an article by creating an account on our website! Go to www.rhochistj.org/RhoChiPost, click the login button from the upper menu bar, and click register. Upon making an account, you will be able to submit articles to our author inbox.

Who determines article topics?

You are free to choose an article topic of your choice. Take a look at our "Author Guidelines" and "Sign Up" sections for writing ideas.

What happens after I upload my draft article on the Rho Chi Post website?

Our Editor-In-Chief (EIC) will either edit the article directly or assign the article to a staff editor. If any revisions are needed, the editor will upload the article back to the portal, notifying the author via email. The author can then download the edited article, make the suggested revisions, and reupload the draft back to the portal. Additional drafts will be reevaluated by either our copy editor or EIC. Once no further revisions are needed, the article is accepted for publication and reviewed by our faculty advisors.

Is there a deadline for authors to send revisions?

There is no deadline to submit revisions for an article. However, the quicker revisions are made, the quicker the article can move through our editing process. Once an article is accepted for publication, it will be moved into a queue to be placed into an upcoming issue.

About the Rho Chi Post

The Rho Chi Post was developed by the St. John's University Rho Chi Beta Delta Chapter in October 2011 as an electronic, student-operated newsletter publication with a team of three student editors and one Editor-in-Chief. Today, our newsletter boasts 11 volumes, over 86 published issues, and more than 600 unique articles with a staff of second to sixth year student pharmacists, as well as returning PharmD graduates.

The newsletter is distributed by St. John's University College of Pharmacy and Health Sciences to more than 1,500 students and faculty members. Our monthly electronic mailing lists continues to extend readership far beyond campus.

Mission

The Rho Chi Post is an award-winning, electronic, student-operated, faculty-approved publication that aims to promote the pharmacy profession through creativity and effective communication. Our publication is a profound platform for integrating ideas, opinions, and innovations from students and faculty.

Vision

The Rho Chi Post aims to become the most creative and informative student-operated newsletter within St. John's University College of Pharmacy and Health Sciences. Our newsletter continues to be known for its relatable and useful content. Our editorial team continues to be known for its excellence and professionalism. The Rho Chi Post sets the stage for the development of individual writing skills, collaborative team work, and leadership.

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Different Dietary Fats and their Association with Cardiovascular Disease

By: Justin Budz, PharmD Candidate c/o 2023

In the United States (US), heart disease is the leading cause of death for both men and women of most racial and ethnic groups, followed by cancer and coronavirus disease 2019 (COVID-19).[1] About 659,000 people in the US die from heart disease each year, which encompasses about 1 in every 4 deaths.[2] From 2016-2017, the total cost of health care services, medications, and loss of productivity due to heart disease was approximately $363 billion.[2] Heart disease broadly categorizes several heart conditions, the most common being coronary artery disease (CAD).[3]

CAD, also referred to as coronary heart disease (CHD), is caused by plaque buildup on the walls of the arteries. A major component of plaque is cholesterol. As the amount of plaque increases, the arterial lumen begins to narrow which can limit or completely block blood flow.[3] Risk factors for heart disease include hypertension, hyperlipidemia, diabetes, obesity, an unhealthy diet, physical inactivity, and excessive alcohol use.[3] Patients with heart disease are advised to make necessary lifestyle modifications such as increasing physical activity, quitting smoking, and eating a diet low in sodium and fat. Medications may be initiated to treat different risk factors. Depending on disease severity, surgical procedures may be considered to help restore blood flow to the heart.[3]

The Impact of Dietary Patterns on Cardiovascular Disease

According to the American Heart Association (AHA), poor diet quality is strongly associated with increased risk of cardiovascular disease (CVD) morbidity and mortality.[4] Adherence to a heart-healthy diet is associated with optimal cardiovascular health. A heart-healthy diet consists of fruits, vegetables, whole grains, healthy sources of protein, liquid plant oils, and minimally processed foods.[4] The Dietary Patterns Methods Project found a 14-28% lower CVD mortality among adults with high adherence compared with low adherence to heart-healthy dietary patterns.[5] A suspected culprit behind worsening CVD is dietary fat. A diet high in fat can increase low-density lipoproteins (LDL). Guidelines for reducing CVD risk recommend limiting dietary cholesterol to decrease LDL levels.[4]

It is a common misconception to assume that all fats are unhealthy. Dietary fats are essential nutrients that provide energy for the body, support cellular function, protect organs, provide insulation, absorb nutrients, and produce certain hormones.[6] There are four types of dietary fat: saturated, trans, monounsaturated, and polyunsaturated fats. Saturated and trans fats are solids at room temperature and are known to increase LDL levels. Saturated fats are mainly found in animal-based foods like beef, pork, poultry, full-fat dairy products, eggs, and tropical oils (coconut and palm).[6]

Trans fats are naturally produced in the gut of certain animals and artificially produced by hydrogenated vegetable oils.[6] In June 2015, the Food and Drug Administration (FDA) determined that partially hydrogenated oils are no longer Generally Recognized as Safe (GRAS)

in human food.[7] Trans fats are typically found in fried foods, baked goods, and stick margarine. The AHA recommends limiting calories to 5-6% from saturated fat while also cutting out foods containing partially hydrogenated vegetable oils to reduce consumption of trans fats.[6]

Polyunsaturated and monounsaturated fats are both liquid at room temperature and are known to decrease LDL levels. Polyunsaturated fats are mainly found in plant-based oils (soybean oil, corn oil, sunflower oil) but can also be found in walnuts, sunflower seeds, tofu, and soybeans.[6] Monounsaturated fats are mainly found in plant-based oils (olive oil, canola oil, peanut oil, safflower oil, and sesame oil) but can also be found in avocados, peanut butter, and many nuts and seeds.[6] The AHA recommends having a nutritionally balanced diet where the majority of saturated and trans fats are replaced by polyunsaturated and monounsaturated fats to lower the risk of heart disease.[6]

Observational Study: Analyzing Risk of Cardiovascular Disease from Vegetable, Dairy, and Animal Derived Fat

The AHA's Scientific Sessions 2021 is a premier global exchange of the latest scientific advancements, research, and evidence-based clinical practice updates in cardiovascular science.[8] At this event, Dr. Fenglei Wang, Ph.D., a postdoctoral fellow in the Department of Nutrition at Harvard's T.H. Chan School of Public Health, presented a study which indicated that the type of fat and food source are more important than the total amount of dietary fat in the prevention of CVD. The study, funded by the National Heart, Lung, and Blood Institute of the National Institutes of Health, analyzed 27 years of follow-up data from 117,136 participants in the Nurses' Health Study (1984-2016) and Health Professionals Follow-up Study (1986-2016).[8] The average age of participants was 50 years old. Of the participants, 63% were women, 97% were white, and all were free of heart disease at enrollment. At the beginning of the study and every 4 years after, participants completed food frequency questionnaires that were used to calculate the amount, source, and types of fat in their diets.[8]

Throughout the duration of the study, 6,189 participants had strokes. Participants who consumed high amounts of non-dairy animal-derived fat were 16% more likely to experience a stroke than those who ate less amounts of non-dairy animal-derived fats. Those who consumed one additional serving of total red meat daily had an 8% higher risk of stroke while those who consumed one additional serving of processed red meat had a 12% higher risk of stroke. In comparison, participants who ate the most vegetable-derived fat and the most polyunsaturated fat were 12% less likely to experience a stroke compared to those who ate the least. Dairy fat was not associated with a higher risk of stroke.[8] Based on these results, it can be assumed that CVD risk is decreased when saturated and trans fats in red and processed meat are replaced with polyunsaturated and monounsaturated fats in non-tropical vegetable oils.[8] It should be noted that this study was observational, and therefore, results cannot establish a cause-and-effect link between fat consumption and stroke risk. Additionally, this study primarily included health care professionals of European descent, and thus the findings may not be generalizable to diverse populations.[8]

Meta-Analysis Study: Systematic Review of Associations Between Cardiovascular Disease and Intake of Saturated and Trans Fats

The authors of a meta-analysis, funded by the World Health Organization (WHO), conducted independent searches for relevant observational studies assessing the association between saturated and trans fats and health outcomes up to May 2015.[9] Eligible studies included any observational study conducted in humans that reported a measure of association between intakes of saturated or trans fats and all-cause mortality, CHD, stroke, or type 2 diabetes.[9]

In the analysis of saturated fats, 20,413 potentially eligible articles were identified. After full text review, the analysis included 73 of those publications.[9] The authors used risk ratio to analyze the health effects caused by a high intake of saturated fat. For saturated fats and all-cause mortality, the risk ratio was 0.99 (95% CI 0.91 to 1.09; P=0.91; I2=33%).[9] For saturated fats and CHD mortality, the risk ratio was 1.15 (95% CI 0.97 to 1.36; P=0.10; I2=70%).[9] For saturated fats and total CHD, the risk ratio was 1.06 (95% CI 0.95 to 1.17; P=0.29; I2=47%).[9] Interpretation of these results indicates that there is no significant association between a higher intake of saturated fats and all-cause mortality, CHD mortality, and total CHD.[9] However, the authors acknowledge that other meta-analyses have found that foods high in saturated fats have been associated with increased mortality.[10] This could relate to the LDL raising effect of saturated fat; replacing saturated fats with polyunsaturated and monounsaturated fats improves LDL levels.[11]

In the analysis of trans fats, 18,835 potentially eligible articles were identified. After full text review, the analysis included 50 of those publications.[9] The authors used risk ratio to analyze the health effects caused by a high intake of trans fat. For trans fats and all-cause mortality, the risk ratio was 1.34 (95% CI 1.16 to 1.56; P<0.001; I2=70%).[9] For trans fats and CHD mortality, the risk ratio was 1.28 (95% CI 1.09 to 1.50; P=0.003; I2=0%)[9]. For trans fats and total CHD, the risk ratio was 1.21 (95% CI 1.10 to 1.33; P<0.001; I2=0%)[9]. Interpretation of these results indicates that consumption of trans fats was significantly associated with a 34% increase in all-cause mortality, a 28% increased risk of CHD mortality, and a 21% increased risk of CHD.[9]

Conclusion

Heart disease currently reigns as the leading cause of death in the US, inciting lifestyle modifications to prevent future development of various heart conditions.[1] Results indicating which macronutrient is associated with CVD varies. Out of the four dietary fats, trans fat is the only nutrient known to be directly associated with an increased risk for CVD and should therefore be limited to < 1% of total calories from a daily diet, as per AHA guidelines.[6,8,9] To obtain a nutritionally balanced diet, the AHA recommends approximately 5-6% of calories are from saturated fat; any remaining sources of fat should be replaced by polyunsaturated and monounsaturated fats to lower the risk of heart disease.[6] In addition to dietary fat consumption, Americans should implement adherence to heart-healthy diets, increased physical activity, and smoking cessation to see benefits in cardiovascular health.[6] Implementation of these lifestyle modifications can help towards decreasing heart disease mortality in the US.

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Interested in learning more about healthy food options, recipes, and tips for weight loss? Check out the American Heart Association's "Healthy Eating" guidelines at:

www.heart.org/en/healthy-living/healthy-eating

Rho Chi Talks: The Pharmacist's Role in a Drug Information Center

Featuring: Nicole Maisch, BS, PharmD
By: Justin Budz, PharmD Candidate c/o 2023

Growing up with close relatives in healthcare, Dr. Nicole Maisch was inspired to pursue a career in pharmacy practice. Dr. Maisch graduated from Albany College of Pharmacy and Health Sciences with her PharmD and then completed a PGY1 residency at the University of Massachusetts Memorial Health Care. Dr. Maisch currently serves as a clinical faculty member at St. John's University College of Pharmacy and Health Sciences. In addition to her didactic teaching, Dr. Maisch serves as the co-director of the Drug Information Center at Long Island Jewish Medical Center where she precepts sixth year pharmacy students undergoing advanced pharmacy practice experiences, as well as pharmacy residents.

Tell us about your education experience.

I graduated from Albany College of Pharmacy with both my Bachelor of Science and my Post-Baccalaureate PharmD. After that, I went over to Massachusetts and completed a PGY1 residency at the University of Massachusetts Memorial Health Care. During residency, I was looking for all sorts of things; I liked psychiatry, pediatrics, and ambulatory care. At the time, you could go right into a PGY2 if you wanted to do a specialty, so I did get an ambulatory care residency in Buffalo, but I chose to do the PGY1 because I felt like I needed to be more well-rounded. Actually, that was a good choice because through the year I did focus a little bit in ambulatory care to try to explore it…and similarly, I did do community just to try it out. So yeah, I found that I liked to work with healthcare practitioners more directly.

How did you find yourself at the LIJ Drug Information Center?

When I started, I was in internal medicine at LIJ rounding with physicians and with the medical teams. LIJ was a community teaching hospital at the time, so we had rounds every morning with the residents. After morning rounds, they would have teaching rounds where the attending that was a hospitalist would come and discuss different topics. At the time, Dr. Laura Gianni was the director of the Drug Information Center and was hiring a faculty co-director. She asked for a faculty line to come and help her, so I just officially applied for it and then transitioned from internal medicine to Drug Information. It was a great fit because I was always listening to the questions the students got and helped them while Dr. Gianni was teaching.

For a student who's never been in a drug information center, how would you describe a typical day?

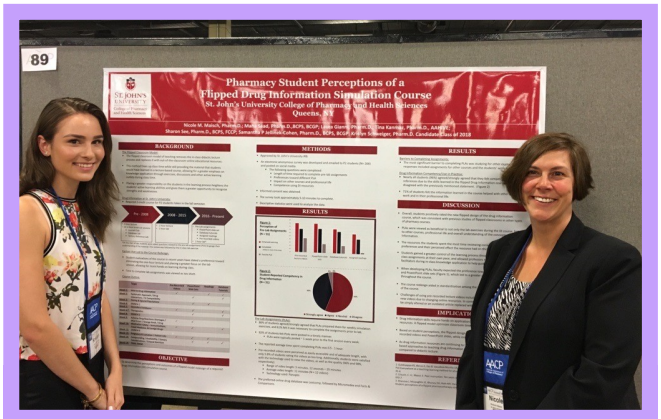
A day in the life of a student is checking the phones and emails for new questions. The phone is a LIJ phone number, but anyone can call it. We have our Northwell email system and then our St. John's email system, so we check those as well. Those are the mechanisms through which we get questions. If one of the faculty members gets a question from another faculty or practitioner, then they will forward the question to our email and the students check them. Once the student starts working on the question, they'll start their research and formulating their draft. We have a standardized mechanism for formulating responses, especially if it requires a literature search. We also run the adverse drug reaction reporting service. So nurses on the floor or the pharmacists will enter their adverse drug reactions. We check the electronic system, evaluate the reports, and then that gets sent to medication safety on a quarterly basis. LIJ also asked us to help out with the Paxlovid hotline…helping the health system has been rewarding for us.

Asides from the LIJ Drug Information Center, what roles do you have at St. John's?

At the college, I teach didactically in the drug information and literature evaluation courses. There's a drug information and laboratory course in the fall for fourth year students and then in the spring, there is a drug literature evaluation course. That's where I primarily teach. I have committee work that I've been involved with through the years. The college has a Library and Learning Resources Committee. I've also been the chair of the Assessment Committee, the co-chair of the Accreditation Council for Pharmacy Education Self-Study Steering Committee, …and I'm also a member of the Personnel and Budget Committee for the CHP department.

With all the drug literature you read every day, do you find yourself working on your own publications or research?

There are three pillars that we (faculty) have to fulfill: scholarly activity, teaching, and service. Right now, I'm actually working with two students on a research project on the timing of aPTTs in patients on a Heparin standardized dosing protocol. They did a research elective with me in the spring of their fifth year. We started with the IRB process in the spring, got them on board with Northwell, …and now we're working on evaluating the data. We had an adverse drug reaction where an aPTT wasn't drawn appropriately; now we're having data pulled to see if that's happening more often. We (faculty) can also write review articles…we actually wrote a book chapter on herbals. One of the North Shore physicians was editing a supplement to the Journal of Therapeutics and then she made that supplement into a book.



Nicole Maisch, BS, PharmD (right), and Krislyn Schweiger, PharmD (left), presenting research at American Association of Colleges of Pharmacy

Any tips for pharmacy students when approaching a drug info question?

The first tip is to remember that the answer might be known! So look at your tertiary resources! Do not just jump to PubMed. You should also verify the information that you find by looking for it in more than one place.

Any tips for pharmacy students looking to do residency?

Get involved…do those things that make you stand out! If you want a research opportunity, try to connect with a faculty member. Maybe something they say runs true with you and is in your interest area, or you just think their personality meshes well with yours. If you're on rotation, look for those opportunities. Maybe you could write a case report. Get involved in organizations!

On behalf of the Rho Chi Post, we would like to thank Dr. Nicole Maisch for taking the time to share her experiences with our community!

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Mark Your Calendars!

Join the Rho Chi Post this Fall Semester as we prepare to host the following events:

Sep. 8th: Activities Fair

Sep. 26th: RCP Informational

Oct - TBT: Writing Workshop

Follow us on our Instagram and Facebook pages to get the most up to date information on all our semester events!

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Paxlovid, the First Oral Antiviral Treatment for Covid-19

By: Kirby An, PharmD Candidate c/o 2023

Coronavirus Disease (Covid-19) is a virus that took the world by storm with its initial discovery in Wuhan, China in December of 2019. On January 20, 2020, the Centers for Disease Control (CDC) confirmed the first case of Covid-19 in the United States (US) after a 35 year old man presented with cough and fever after returning to Washington from Wuhan, China.[1] By the end of 2020, Covid-19 had infected over 82 million people worldwide, leading to a death toll of over 3 million people.[2] As of August 2022, there are 94,268,241 total cases of Covid-19 infection in the US, with a death toll reaching 1,040,314.[3] Despite the grueling numbers, the US has made great strides in combating the pandemic through prevention. While mask mandates and social distancing played a huge part in diminishing Covid-19 rates in the US, the rapid development of nationwide vaccination initiatives was a key component to slowing down the spread of the virus. Today, thanks to the accessibility of vaccinations, about 224 million people are fully vaccinated and the CDC records that about 84% of people aged 5 and older have received at least the first dose of a vaccine series.[3]

While vaccines have proved to be efficacious in preventing Covid-19, therapeutic options are still necessary for post-exposure treatment. To date, there are only a few approved and emergency authorized antiviral medications available for use. The drugs currently recommended target either the conserved viral RNA-dependent RNA polymerase (RdRp), the conserved viral main protease (Mpro or 3CL protease), or block SARS-CoV-2 entry.[4] In the treatment of hospitalized patients with Covid-19 that do not require oxygen supplementation, the drug of choice is a RdRp-specific antiviral medication known as remdesivir.[5] Remdesivir was the first antiviral medication approved for the treatment of Covid -19 and has been proven to improve clinical outcomes of hospitalized patients and slow disease progression.[4] Despite the effectiveness of remdesivir, it requires intravenous administration which limits its access to the inpatient setting. In order to continue making strides in combatting the pandemic, oral antiviral medications, like Paxlovid, were developed to provide accessibility in the outpatient setting.

Paxlovid, co-packaged nirmatrelvir and ritonavir, is an oral antiviral medication approved by the Food and Drug Administration (FDA) for emergency use authorization on December 22, 2021.[6] Nirmatrelvir is a peptidomimetic inhibitor of the SARS-CoV-2 main protease, Mpro (or 3CL protease). Mpro is a cysteine protease that cleaves polyproteins pp1a and pp1ab, which are key components of viral replication for SARS-CoV-2. By irreversibly inhibiting Mpro, viral replication is hindered. Ritonavir is an HIV-1 protease inhibitor that is not directly active against SARS-CoV-2 Mpro. However, ritonavir inhibits CYP3A activity, the enzyme that metabolizes nirmatrelvir, which increases the plasma concentration and half-life of nirmatrelvir.[7]

Clinical Trial Results

Pfizer conducted an international, phase 2-3 double blind, randomized controlled

trial to assess the efficacy, viral load, and safety of Paxlovid in preventing disease progression in unvaccinated adults with mild to moderate Covid-19 who were at high risk of progression to severe infection. This study consisted of 2,246 adults aged 18 years or older with confirmed SARS-CoV-2 infection.[8] Patients who were included in the trial had more than 1 comorbidity associated with increased risk of developing severe Covid-19 illness. These characteristics included age ≥ 60 years, BMI > 25 kg/m^2, cigarette smoker, immunosuppressive disease or suspected/confirmed active systemic infection, and comorbidity requiring hospitalization and/or surgery or considered life threatening ≤ 7 and ≤ 30 days, respectively, prior to study entry.[8] 61% of participants had two or more conditions listed in the inclusion criteria.[9] The study excluded patients who were pregnant or breastfeeding, or who had active liver disease, moderate to severe renal impairment, known HIV, previous confirmed SARS-CoV-2 infection, anticipated need for hospitalization within 48 hours after randomization, and prior receipt of convalescent Covid-19 plasma or SARS-CoV-2 vaccine.[8]

Eligible patients were randomly assigned to the experimental or control group in a 1:1 ratio. Participants were given either nirmatrelvir 300 mg plus ritonavir 100 mg or placebo every 12 hours for 5 days, starting within 5 days of the onset of symptoms. The primary objective was to assess the efficacy of Paxlovid by comparing the percentage of patients with Covid-19 related hospitalizations or death from any cause through day 28. The primary endpoint focused on a modified intention-to-treat population which included 1,379 of the 2,246 patients in the full analysis population. Secondary end points looked to quantify SARS-CoV-2 viral loads, as well as assess adverse events that occurred during or after treatment before day 34.[8]

In the analysis of patients who received treatment within 3 days after symptom onset, 5 of 697 patients (0.72%) in the Paxlovid group and 44 of 682 (6.45%) in the placebo group were hospitalized for Covid-19 or died from any cause through day 28. The study also used the Kaplan-Meier method (statistical analysis of survival probability) and found estimated rates of Covid-19 associated hospitalization or death from any cause at 28 days to be 0.72% in the Paxlovid group and 6.53% in the placebo group, corresponding to a difference of −5.81% (95% CI –7.78 to –3.84; P<0.001) and an 88.9% relative risk reduction in Covid-19–related hospitalization or death from any cause. Looking at mortality rates, nine deaths were reported in the placebo group, and none were reported in the Paxlovid group.[8] A secondary analysis included patients who received treatment within 5 days after symptom onset to evaluate hospitalization for Covid-19 or death from any cause. In the analysis of this population of study, 8 of 1,039 patients (0.77%) in the Paxlovid group and 66 of 1,046 (6.31%) in the placebo group were hospitalized for Covid-19 or died from any cause through day 28 (P<0.001), corresponding to an 87.8% relative risk reduction.[8]

The incidence of adverse events that occurred during the treatment period was similar in both experimental and control groups. Incidence of any adverse event occurring was 22.6% with Paxlovid vs. 23.9% with placebo. Serious adverse events occurred in 1.6% with Paxlovid vs. 6.6% with placebo. Any adverse events leading to discontinuation of the drugs or placebo were 2.1% in Paxlovid vs. 4.2% in placebo. Dysgeusia (5.6% vs. 0.3%) and diarrhea (3.1% vs. 1.6%) were two adverse reac-

tions that had been found to occur more frequently with Paxlovid than with placebo.[8]

Clinical Use of Paxlovid

Currently, Paxlovid is a preferred therapy in those who do not require hospitalization or supplemental oxygen, and are at higher risk of progression to serious infection. In those aged 12 years and older who weigh ≥ 40 kg, guidelines recommend Paxlovid at a dose of 300 mg of nirmatrelvir and 100 mg of ritonavir by mouth twice daily for 5 days.[9] Treatment is recommended as soon as possible and within 5 days of the onset of symptoms. The recommended dose reduction in patients with moderate renal impairment and an eGFR between 30 -60 mL/min is 150 mg nirmatrelvir and 100 mg of ritonavir twice daily for 5 days.[5] In patients with severe renal or hepatic impairment, Paxlovid should be avoided. A major concern for Paxlovid is the concomitant use of drugs highly dependent on CYP3A clearance that may otherwise lead to serious adverse reactions; dose adjustments and additional monitoring may be necessary. Paxlovid is currently only authorized in those 12 years and older weighing at least 40 kg. There is currently no human data on nirmatrelvir during pregnancy that evaluated the risk for birth defects, miscarriage, or adverse fetal or maternal outcomes.[7] The most common side effects correlated with the use of Paxlovid include dysgeusia, diarrhea, hypertension, and myalgia.[7]

Conclusion

While the medical field continues its efforts to keep up with the pandemic, guidelines and new treatments are changing and developing. On July 6, 2022, the FDA recognized the importance of pharmacists in the pandemic and authorized pharmacists to prescribe Paxlovid. Under the revised emergency use authorization, pharmacists can prescribe Paxlovid except for when modification of other medications is necessary due to drug-drug interactions, renal or hepatic function is undefined, or if there is not enough information to assess for the potential of drug interactions.[10] With Paxlovid being an oral antiviral medication that can be dispensed at any community pharmacy and taken from home, we come closer to tackling Covid-19 by providing increased accessibility to treatment.

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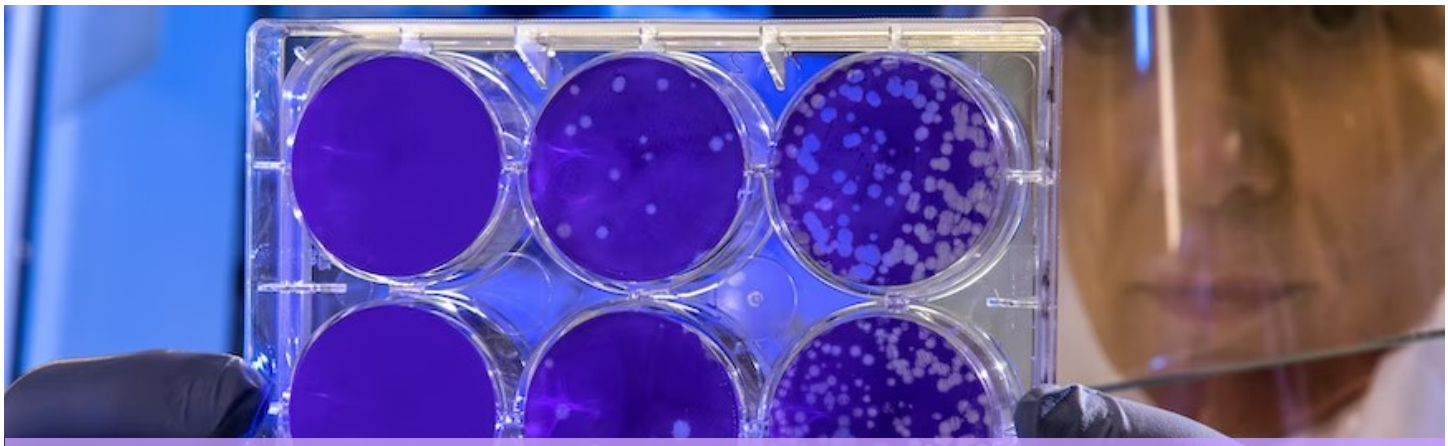

Balancing Early and Appropriate Antibiotic Therapy and Antimicrobial Stewardship Efforts in Sepsis and Septic Shock

By: Angela Basir, PharmD Candidate c/o 2023 and Muatasem Jaser, PharmD Candidate c/o 2023

Sepsis is a clinical syndrome defined as a life-threatening organ dysfunction caused by a dysregulated host response to an infection.[1] Septic shock is a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality.[2] Being that sepsis is a medical emergency, early identification for treatment is essential. Signs and symptoms of sepsis are generally nonspecific and include confusion, disorientation, tachycardia, fever, chills, and diaphoresis.[2] It is crucial to administer antibiotics in a timely manner and utilize antimicrobial stewardship efforts in order to avoid progression to septic shock and increased mortality rates.

The underlying pathophysiology of sepsis is very complex and not completely understood. The host response to infection results in the release of excess pro-inflammatory mediators which spread throughout the entire body and cause systemic inflammation, organ dysfunction, and tissue damage. Cellular injury occurs through tissue ischemia, cytopathic injury, and alterations in the rate of apoptosis. Almost all organ systems are impacted, including the circulatory, pulmonary, gastrointestinal, hepatic, renal and central nervous systems. The circulatory system responds with diffuse vasodilation and increased endothelial permeability secondary to inflammation. These alterations can ultimately lead to hypotension, intravascular hypovolemia, and hypoperfusion.[3] An array of clinical screening tools, including the quick Sequential Organ Failure Score, Sequential Organ Failure Assessment, Systemic Inflammatory Response Syndrome Criteria, and National Early Warning Score (or Modified Early Warning Score), are important for initiating empiric treatment.[1]

In October of 2021, revisions were made to the *Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock.*[1] Multiple recommendations were discussed in comparison to the previous guidelines published in 2016. Major changes were made regarding the recommended optimal time for antimicrobial administration. For *definite* or *probable* sepsis, with or without shock, the initiation of antimicrobials should be within 1 hour of recognition. For adults with *possible* septic shock, or a high likelihood for sepsis, antimicrobials should be administered within 1 hour of recognition. Additionally, the current recommendation for adults with *possible* sepsis, in the absence of shock, is to ad-

minister antimicrobials within 3 hours from the time of sepsis recognition.[1]

The rationale for the timing of antimicrobial administration comes from a retrospective cohort study conducted by Kumar et al. which analyzed adults aged 18 years and older with septic shock.[4] This study took place in 14 intensive care units across the United States and Canada, involving 2,154 patients with septic shock and similar acute physiology and chronic health evaluation (APACHE II) scores. APACHE II uses a point score based upon initial values of 12 routine physiologic measurements, age, and previous health status to provide a general measure of severity of disease.[5] The average score was 26 (range 0 to 71), with an increasing score ultimately depicting an increase in the risk of hospital mortality.[5] The average age of participants was 63 years old with an approximately equal distribution between males and females. Roughly 66.5% of the infections occurred within the respiratory system, gastrointestinal tract, or intra-abdominal area.[4]

Kumar et al. sought to see if there was any association between early effective antimicrobial therapy and increased survival rates in patients with septic shock. In order to evaluate this, the time of antimicrobial therapy initiation following an onset or recurrence of hypotension was recorded. The study defined hypotension as one of the following: a mean arterial blood pressure of 65 mmHg or less, a systolic blood pressure of 90 mmHg or less, or a decrease of 40 mmHg from baseline. According to figure 1, antimicrobial therapy administered within 30 minutes of the initial signs of hypotension was associated with an 82.7% survival rate. When antibiotics were administered within the first hour of hypotension, the associated survival rate was 77.2%. Of note, over the first 6 hours after the onset of hypotension, each hour of delayed antimicrobial therapy was associated with a reduction in survival rates by 7.6% (range 3.6 to 9.9%). Furthermore, figure 2 represents the time of hypotension onset and mortality rates, expressed as an odds ratio. Within the first 2 hours of delayed antimicrobial therapy, the odds ratio for mortality was approximately 1.7 (95% CI 1.12 to 2.48), and showed a statistically significant increase to a maximum odds ratio of 93 when therapy is delayed for more than 36 hours.[4]

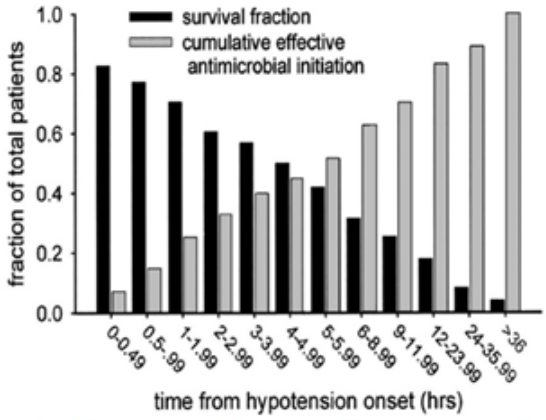

Figure 1: The cumulative effective antimicrobial initiation following onset of a septic shock associated hypotension and associated survival.[4]

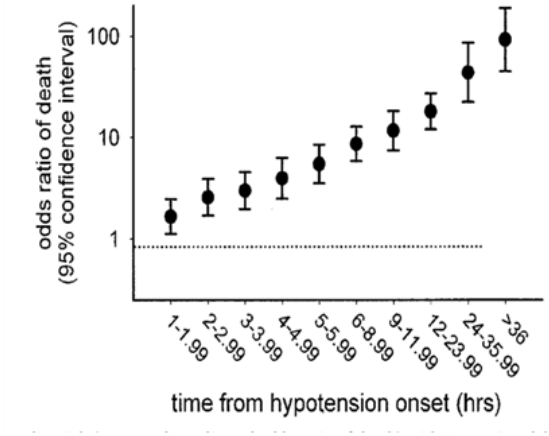

Figure 2: The mortality risk, expressed as adjusted odds ratio of death, with increasing delays in initiation of effective antimicrobial therapy.[4]

The above data suggests that early administration of antimicrobial therapy in patients with septic shock is associated with a decrease in hospital mortality, length of stay, and organ dysfunction.[4] Therefore, it would be of best practice for the medical team to make a maximum effort in ordering, delivering, and administering effective antibiotics as quickly as possible for patients with presumed sepsis or septic shock.

Extending the time frame for the administration of antimicrobials in possible sepsis to 3 hours allows for a time-sensitive course of rapid investigation to rule out other causes of illness, which may be beneficial in the management of antimicrobial stewardship.[1] Antimicrobial stewardship is a coordinated set of interventions which are designed to improve and to measure the appropriateness of antimicrobials.[6] Antimicrobial stewardship promotes the selection of optimal drug regimens, doses, duration of therapies, and routes of administration to prevent the overuse of broad-spectrum antibiotics. Limiting therapy to the shortest duration prevents resistance and improves patient outcomes.

Sepsis diagnoses are subjective in nature, and signs and symptoms are overall nonspecific. Questions may arise as to how to pick an appropriate empiric antibiotic regimen in such a limited timeframe. This is where antimicrobial stewardship efforts play a vital role, especially when broad spectrum antimicrobial coverage, or empiric therapy, is needed. Empiric therapy refers to antibiotics that are administered during the period prior to the receipt of blood cultures and antibiotic susceptibility test results.[7] Once more information is known about the infection, several antimicrobial stewardship efforts can be made by clinical pharmacists to optimize treatment and minimize the risk of resistance. For example, once the pathogen is identified and susceptibility results are known, antibiotic de-escalation should be implemented, and definitive therapy should be used. Definitive therapy is defined as using the narrowest spectrum antibiotic that a bacteria is susceptible towards.[8] The use of de-escalation protocols and susceptibility reports are major advancements in improving resistance. Examples include switching from double coverage combination therapy to monotherapy or discontinuing empiric antibiotics for bacteria found not to be isolated in cultures.[9]

Rapid diagnosis and administration of appropriate antibiotics is essential for the improvement of mortality in patients with sepsis. Strategies including de-escalation and discontinuation should be implemented as well, especially in situations where illnesses are due to noninfectious causes or when susceptibility test results are available. The allowance of a 3-hour interval prior to starting antimicrobial therapy in patients with possible sepsis in the absence of shock will more than likely have a positive impact on the rates of resistance patterns as this prevents the overuse of broad-spectrum antibiotics in situations where use may not be warranted. Additionally, it is essential to understand the importance of implementing a multidisciplinary approach to patient care which adheres to the standards of antimicrobial stewardship programs. This is where the role of pharmacists becomes vital in the treatment of infections requiring multiple courses of antimicrobial therapy.

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Standing Order for Naloxone in Pharmacies in New York State: A Step Closer in Pharmacy Advocacy

By: Helen Li, PharmD Candidate c/o 2023

On August 15, 2022, the New York State Commissioner of Health, Dr. Mary T. Bassett, implemented a statewide pharmacy standing order for naloxone.[1] With this authorization, all pharmacists can assist in reducing mortality from opioid abuse, while optimizing the pharmacists' continuous role in public health.

In 2017, the Department of Health and Human Services (HHS) officially declared opioid overuse as a public health emergency in the United States. On average, approximately 10 million people misuse opioids per year, with approximately 50,000 of those cases resulting in death from opioid overdose.[2] During the COVID-19 pandemic, the number of opioid-related deaths accelerated. The Centers for Disease Control and Prevention (CDC) found that 81,000 opioid-related overdose deaths occurred in the 12 months ending in May 2020.[3] Increased public access to naloxone can help decrease mortality associated with opioid abuse.

Naloxone is available by the Food and Drug Administration (FDA) in two approved forms: as an injectable and as a nasal spray. Naloxone, an opioid antagonist, is an easily administered medication that can rapidly reverse life-threatening adverse effects of opioid overdose when used in a timely manner.[1] Naloxone displaces receptor-bound opioids and inhibits opioid receptors, which not only reverses opioid-induced adverse effects but also blocks any additional opioid action. Naloxone quickly restores an individual's normal breathing in those with respiratory depression, preventing any corresponding cardiac arrest, brain damage, and death.[1] Naloxone can be used in individuals suspected of opioid overdoses. Signs and symptoms of opioid overdose include loss of consciousness, unresponsiveness to stimuli, slurred speech, shallow or slow breathing, skin color changes, and choking sounds.[4] Naloxone has no effect on individuals who have not consumed opioids. Naloxone should not be used as a treatment option for opioid-use disorder.[5]

A standing order is a written protocol that authorizes designated health care professionals to complete a clinical task without having to first obtain a physician order.[6] The New York State Department of Health issued a non-patient specific prescription standing order for naloxone. Pharmacists and supervised pharmacy interns can now dispense naloxone to anyone who requests it, without a patient-specific prescription.[7] Naloxone and any necessary supplies for its administration can be prescribed and dispensed to individuals under this standing order. Naloxone can also be administered to individuals experiencing an opioid overdose and who encounter or witness an opioid overdose. Patients can obtain naloxone at their local pharmacies without a written prescription by requesting the medication at the pharmacy counter with their insurance information.[1]

Currently, pharmacists play a crucial role in improving public health with their ability to administer vaccines without a written pre-

scription. With the implementation of the standing order for naloxone in New York State, the role of pharmacists continues to evolve. Pharmacy advocacy has not only expanded the role of pharmacists, but also promotes the involvement of student pharmacy interns. Most importantly, it allows pharmacists to become key accessible solutions to driving down mortality rates from opioid abuse.

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6th Year Perspective: Experiences in the Pharmaceutical Industry

Featuring: Khushbu Doshi, PharmD Candidate c/o 2023
By: Justin Budz, PharmD Candidate c/o 2023

Khushbu Doshi is a sixth-year pharmacy student at St. John's University. During her time at St. John's, Khushbu has served on the boards of a variety of campus organizations and has had invaluable internships and APPE rotations pertaining to the pharmaceutical industry. Khushbu's goal after graduation is to obtain a post-doctoral fellowship in Regulatory Affairs. Her interests in the pharmaceutical industry stem from a curiosity into the legal side of pharma, specifically to how laws and regulations are applied to the medications pharmacists and healthcare professionals utilize so frequently.

Why did you choose to go to pharmacy school?

I wanted to be a part of healthcare, but I wasn't sure what I wanted to do. I found managing the diagnosis to be a little bit more interesting than actually making the diagnosis. While I was in pharmacy school, I saw all the different avenues that you could take… and it was cool that you weren't stuck in…one therapeutic area. You could kind of move around and learn about different things. And I liked that sense of learning and constant growth that came with the profession.

What clubs and organizations have you been a part of at St. John's?

I was Historian and then Vice President of CPNP (College of Psychiatric and Neurologic Pharmacists), Vice President of Rho Chi, and currently I'm the President of Student Congress.

Tell us about your internship experience with Merck.

I was the Regulatory Planning and Publishing Intern at Merck for the summer…so my role was with onboarding and getting familiar with the role as a Regulatory Submission Manager (RSM). That's the person (RSM) who's planning all of the submission timelines. They also execute the strategy portion of regulatory, so they work with the GRL (Global Regulatory Liaison) to come up with the timelines. I was part of the onboarding team so my role was more like, "how do we get the RSM up to date" or "what information do they need to execute the job properly". I was looking at everything through the perspective of a new hire and at what they might need to support themselves. I think Merck is unique in that they really emphasize networking and finding your place within the company. My manager was really supportive of me learning about different functional areas and networking with people…to learn about their roles.

Tell us about your internship experience with Novartis and how it differed from Merck.

My internship at Novartis was in Labeling Strategy, so both internships were in Regulatory Affairs but in different areas. With Novartis, …I worked on projects that were actually going to be submitted as part of their IND (Investigational New Drug) or NDA (New Drug Application), whereas at Merck, I was focused more on what someone being new to the role would need. So I was a little bit more on the back end at Merck. At Novartis, I was more involved in the actual things that my manager was doing; he was the Global Therapeutic Area Lead, so he was writing these documents which would become the USPI (United States Prescribing Information). Also at Novartis, I think I had more of an opportunity to meet within regulatory and within my team…whereas at Merck, I had a little bit more opportunity to experience other areas. That might have come down to the fact that I was in my sixth year of pharmacy school while at Merck, so they really wanted me to have the opportunity to see all the other functional areas to make sure that when I was applying for fellowships, that's what I really wanted to do. At Novartis, I was in my fourth year, and they knew that I liked regulatory, so they fostered my growth within that functional area itself. So overall, two different experiences but both really good and very fitting.

What was the most valuable lesson you learned from these internships?

At Novartis, …my manager was a very big proponent of me taking the time to attend meetings and sit with him. So I didn't start with projects right from the beginning. I spent the first week or two fully sitting in meetings with him and then he would set up meetings with me afterwards and we would talk about what happened, what I learned, and if I had any questions. At the beginning, I didn't understand that because I thought that I wanted projects right from the beginning to be helpful and make a difference on the team. But in those first two weeks, I thought it was so valuable, now looking back on it, that I gave myself the time to learn and understand the dynamics of the team and…what the role actually was. And I think if my first experiences were doing projects all the time, …I wouldn't have been as successful in the role as I had been. It taught me to slow down and kind of level myself before I got too ahead of myself.

Asides from your internships, you also had an APPE rotation with the FDA. Can you tell us more about this experience?

At the FDA, I was in the Division of Drug Information. The first portion involved these write ups for advisory committee meetings where we would basically create documents from the meetings for internal use. The other portion was answering drug information questions from different stakeholders using the FDA website and their regulations and guidance to see what was applicable to the questions. So that was really interesting to see how the agency looks at the questions that come in, and then how you're trained to answer them. With the write ups, you'd present to the whole division and everybody would come and listen to what happened at the meetings, because a lot of times if a stakeholder asked you a question, they would use those internal documents to see if a recording of that advisory committee would help that person understand more about the question they had.

What was the most valuable lesson you learned from the FDA rotation?

I think it was really good for presentation skills. I had a really hard time prioritizing information for write ups. My write ups would be like 30 pages long, and that's not an easy thing to go through for someone to quickly see if the information they need is actually going to be in that committee meeting. I worked a lot on prioritizing information to what was actually applicable. I think this was a great way for me to hone in on those writing and comprehension skills in order to answer drug information questions.

What tips do you have for students who may be interested in pursuing an internship in the pharmaceutical industry?

When I was applying for internships in my third year, the only company that I heard back from was Novartis and the only team that I heard back from was my labeling team. I think that the more you apply to, that's great, but I would also advise to apply for positions that you're actually interested in. I always loved the legal side of pharma and how laws and regulations applied to the medications we put out, so regulatory, in that sense, was kind of my interest right from the beginning. So yes, I do recommend applying to all places, because the more chances you have, the better, but I also recommend having actual thoughts as to why what you're applying to matters to you and why you would be well fit for that role. I also think that getting involved in campus is not only good for your resume but on top of that, it gives you a lot of skills that you probably wouldn't have developed otherwise. For me, it was time management and leadership. I was able to put those two skills together in a lot of the roles that I've done when I needed to present to people, lead a team, or lead a submission. But I think that having those leadership experiences and that positive reinforcement from your peers really helped me in being able to speak to that in interviews. Lastly, start early! You might think that you're too young to do this stuff, but there's no harm in trying. There are people that will teach you the role if you want to do it and you're willing to put in that time. I feel like that an openness to learn really carries you through and that's kind of why I have been successful to a certain degree in the roles that I've had.

On behalf of the Rho Chi Post, we would like to thank Khushbu for taking the time to share her APPE experiences with our community!

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Wegovy® (Semaglutide): New FDA Approval for Use in Obesity

By: Pauline Choi, PharmD

There has been an increase in the prevalence of obesity, and it has become an international health problem amongst all age-groups, including children, adults, and adolescents. According to the World Health Organization (WHO), the definition of obesity for adults and children is a BMI $\geq$ 30 kg/m^2, and a weight-for-height greater than 2-3 standard deviations above the WHO Child Growth Standards.[4] Obesity is one of many risk factors for metabolic syndrome, which itself is not a disease, but rather a collection of risk factors. These risk factors include dyslipidemia, type 2 diabetes mellitus (T2DM) and hypertension (HTN).[2,5] As obesity is associated with both a widespread of diseases and a widespread of age groups, it is imperative that healthcare professionals direct their attention at addressing this pressing health issue.

On June 4, 2021, the Food and Drug Administration (FDA) approved Wegovy® (semaglutide) for chronic weight management. This medication is indicated for obese patients with a BMI $\geq$ 30 kg/m^2 or overweight patients (BMI of > 25 kg/m^2) with at least one weight-related comorbid condition (HTN, T2DM, dyslipidemia).[2] Obesity is a disease that can be prevented by making healthier food choices and engaging in regular physical activity.[4] When patients lose 5-10% of body weight through diet and exercise, it is associated with a reduced risk of cardiovascular disease in patients with obesity.[2] Wegovy® should be used in addition to a reduced-calorie diet and increased physical activity to achieve optimal therapeutic outcomes.[2]

Wegovy® is a glucagon-like receptor agonist (GLP-1 RA), making it an incretin-based drug. When the GLP-1 receptor is prompted, it not only has a significant role in the stimulation of secreting insulin postprandially, but it also aids in enhancing satiety and delaying gastric emptying, eventually leading to decreased body weight.[5] Prior to its approval for the treatment of obesity, semaglutide was previously indicated for the treatment of T2DM as a subcutaneous injection (Ozempic) and oral pill (Rybelsus). Wegovy® comes as a pre-filled, disposable, single-dose pen with a clear, colorless solution. The pen can deliver doses of 0.25 mg, 0.5 mg, 1 mg, 1.7 mg, and 2.4 mg.[6]

Wegovy® should be administered according to the dose-escalation schedule; starting with 0.25 mg injected subcutaneously once weekly and gradually increasing to 2.4 mg. However, if the patient is not able to tolerate a dose during the escalation period, consider delaying escalation for 4 weeks. The maintenance dose the patient would be on thereafter is 2.4 mg injected once weekly. If the patient does not tolerate the maintenance dose of 2.4 mg once weekly, the dose can be temporarily decreased to 1.7 mg once weekly for a maximum of 4 weeks. After those 4 weeks, increase back to the maintenance dose, and if the patient is still unable to tolerate the maintenance dose, discontinue the medication. Some common side effects are nausea, diarrhea, vomiting, constipation, and abdominal pain. In order to minimize gastrointestinal adverse reactions, it is recommended to follow the dose escalation schedule.[6]

Safety and efficacy studies were conducted as four 68-week trials. Three of those studies were randomized, double-blind, placebo-controlled trials. The fourth study was a double-blind placebo-controlled, randomized withdrawal trial in which patients receiving Wegovy® either continued with the treatment or were switched to a placebo. More than 2,600 patients received Wegovy® and more than 1,500 patients received placebo. In study 1 (the largest trial), patients with diabetes were not included. The average body weight and BMI of the population was 231 pounds (105 kg) and 38 kg/m^2, respectively. Patients who received Wegovy® lost nearly 12.4% of their initial body weight on average compared to the patients who did not receive Wegovy® (95% CI -11.6 to -13.3). Study 2 included patients with diabetes, and the average body weight and BMI of this population was 220 pounds (100 kg) and 36 kg/m^2, respectively. In this study, patients who received Wegovy® lost about 6.2% of their initial body weight on average compared to those who did not receive Wegovy® (95% CI -5.2 to -7.3).[2] Study 3 and 4 included patients classified as obese (BMI $\geq$ 30 kg/m^2) or overweight (BMI 25-29.9 kg/m^2) and at least one weight-related comorbid condition; however, patients with T2DM were excluded. Study 3 randomized patients in a 2:1 ratio to receive either Wegovy® or placebo. In study 4, every patient received Wegovy® during the run-in period of 20 weeks, which included the 16 weeks of dose escalation, and then were randomized thereafter. Patients in study 3 who received Wegovy® lost about 10.3% of their initial body weight on average compared to those who got the placebo (95% CI -8.7 to -11.8). In study 4, patients lost about 14.8% of their initial body weight on average compared to those who received the placebo (95% CI -13.5 to -16.0).

Contraindications to semaglutide include anyone with a history, whether familial or personal, of medullary thyroid carcinoma or Multiple Endocrine Neoplasia syndrome type 2. Caution should be taken because of the potential risk of thyroid C-cell tumors. In rodents, semaglutide caused thyroid C-cell tumors that are dependent on dose and the length of treatment. It is vague as to whether the medication itself causes thyroid C-cell tumors in rodents as well as humans. Wegovy® also has a warning for acute pancreatitis. Both fatal and non-fatal hemorrhagic or necrotizing pancreatitis has been seen in patients on GLP-1 receptor agonists, including Wegovy®. Signs and symptoms of acute pancreatitis include persistent severe abdominal pian, sometimes radiating to the back, which may or may not be accompanied by vomiting. Wegovy® should also not be prescribed in conjunction with other products containing semaglutide, other GLP-1 receptor agonists, or other weight loss products, including prescription drugs, over-the-counter medication, or herbal products.[6]

Wegovy® may be a great option to aid in the minimization and prevention of future health complications associated with obesity. As obesity becomes more prevalent, health care providers can find eligible candidates for Wegovy® to decrease the rates of obesity while also promoting lifestyle changes.

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Follow us on our socials to stay up to date with new articles and upcoming events!

http://fb.com/RhoChiPost

@sjurhochipost

The Rho Chi Society

Membership in The Rho Chi Society is a privilege accorded to the very few who distinguish themselves by their academic and professional achievements and who aspire to the mission and vision of the Society. Members may be elected as professional or graduate students in pharmacy, as members of faculties of schools and colleges of pharmacy, as alumni who distinguish themselves in the profession, or as honorary members by special action of the society's Executive Council. By its very existence, the honor society reflects Western cultural belief in education and the pursuit of intellectual excellence. The honor society aims to recognize and reward outstanding scholarly attainment, and encourages and stimulates outstanding scholarship.

RHO Rx CHI post

Meet Our 2022-2023 Editorial Team

Editorial Team & Production

Justin Budz
Editor-in-Chief

Over the past year, I had the pleasure of serving as the Development and Outreach Coordinator for the Rho Chi Beta Delta Chapter. The most invaluable aspect of serving a role on their executive board was to continue the tradition of developing and distributing resources to stimulate intellectual leaders in our college of pharmacy student body. As the new Editor-In-Chief, I look forward to working alongside the talented students and graduates to produce publications that will follow advancements in healthcare and pharmaceutics in order to continue that same tradition of promoting intellectual leadership among our readers.

Jason Ifeanyi, PharmD
Senior Content-Focused Copy Editor

Last year I had the pleasure of serving as Editor-In-Chief for the Rho Chi Post. It was amazing to see the growth we had as an organization, and the many students, faculty, and pharmacists we were able to connect our content with. I aim to continue and expand upon this growth as a content-focused Copy Editor this academic year. I look forward to working alongside this group of talented and driven students to effectively deliver newsletter publications that keep readers up to date on advancements made within the field of pharmacy.

Mandy Zheng

Senior Graphics-Focused Copy Editor

I am excited to be a part of Rho Chi Post, a place for pharmacy students to share insights, opinions, and new discoveries. As future pharmacists, the issues that exist in the US healthcare system will have to be addressed and improved by us. Rho Chi Post informs students on all aspects of pharmacy and serves as an example and inspiration for others. Pharmacy is an ever-changing and dynamic field, and there are vast career opportunities and pathways for pharmacy students. I look forward to working, listening, and learning from my fellow students and future colleagues; and I hope to serve as a guidance to others as others have done for me.

Ruksabha Zaman

Graphics-Focused Copy Editor

It is an honor to be able to contribute to the Rho Chi Post, a publication that promotes intellect, values, and inclusivity in order to allow student voices to make an impact, not only in our school, but in the pharmacy profession as a whole. The role of pharmacists is constantly evolving and it is more important than ever for us to not only be aware of the changes and new discoveries that are occurring in our field of practice but to be able to collaborate with other professionals on our team as well. The Rho Chi Post serves as a bridge between students, faculty, pharmacists, and other healthcare professionals outside of the classroom. I look forward to gaining new knowledge on current events from my peers and providing my own insight to further the excellence of this newsletter.

Helen Li

Staff Editor

The Rho Chi Post allows pharmacy students the opportunity to be well informed about the amazing contributions in the field of pharmacy. It is a great platform for students to report current advancements in healthcare. My passion for writing began at a young age as I began to understand just how powerful words can be to communicate. I look forward to being a part of the editorial team and to share new information to my peers. I am so excited to be a part of the Rho Chi Post team.

Sana Ahmed

Staff Editor

I believe the Rho Chi Post is a means to serve the university and impact its professional and health-oriented student community through its various stories. With exposure to a myriad of areas of the healthcare field throughout my work experience, I have secured much knowledge from assisting a diverse array of patients. I will prioritize staying up to date and aiding student writers in presenting the latest pharmaceutical and medical advancements. Through the Rho Chi Post, I intend to promote the pharmacy profession through creativity and effective communication. I am honored to serve as a Staff Editor for this organization and hope it will facilitate meaningful connections with my peers.

Geraldine Ciaccio

Staff Writer

The pharmacy profession is constantly growing as it drives for discovery. The Rho Chi Post allows student pharmacists to expand their knowledge of pharmacy while offering a space of collaboration and encouragement. I have always enjoyed writing, and I am so honored to be a Staff Writer for the Rho Chi Post this year. This opportunity will allow me to explore my personal interests within the pharmacy profession as well as encourage my peers to do the same. I am excited to collaborate with and learn from faculty, alumni, and my fellow students. These conversations are vital for change and discovery to occur. Taking a step beyond the classroom and building on previous knowledge is all it takes to grow as professional student pharmacists

Jennifer Galvet

Staff Writer

With the pharmacy profession constantly evolving and shifting its focus to advanced patient care, it is important to be knowledgeable of these changes. Although never formally part of the Rho Chi Post e-board before, I was able to utilize this platform in the past to share my writing on various pharmacy topics. I am looking forward to serving as a staff writer this upcoming year and continuing to share my passion about vital developments in healthcare through my writing. As I enter my fifth year of pharmacy school, I hope to keep fellow students informed, while simultaneously inspiring them to expand their knowledge on our ever-changing profession.

Anjali Rana

Staff Writer

My desire to learn about medicine and its effect on the human body began with a nebulizer. I had asthma as a young girl. Seeing the vaporous gases from the pump never ceased to amaze me. My sickness fueled my interest in the functions, limitations, and exploitations of drugs. I have always had a passion for advocating for change and believe the Rho Chi Post adds great value to the community. Having the chance to be a Staff Writer provides me an opportunity to learn about my peers and advancements in healthcare. Combining concepts learned from pharmacy school with the mission to help those in need will create a stronger foundation for future healthcare professionals.

Imaan Sekhery

Staff Writer

As students in pharmacy, it's our responsibility to educate and update, not only our peers on new medical advancements, but also educate ourselves. Being apart of the Rho Chi Post team allows us to consistently keep up to date with the ongoing improvements and innovations within the pharmaceutical field. There is only so much we can learn from our day-to-day classes; the Rho Chi Post stands as another gateway to familiarizing ourselves with the professional world we will soon enter. The world around us continues to evolve, it is up to us to remain in the know. As a staff writer, I am delighted to join the editorial team and look forward to contributing in the aspect of benefitting the pharmacy community as a whole.

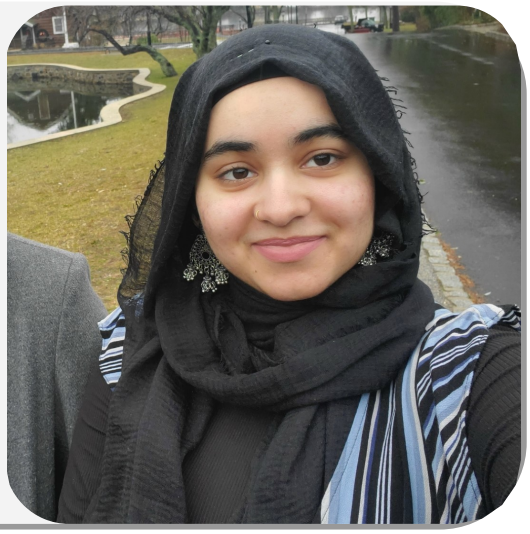
Sairah Sheikh

Staff Writer

Ever since I was little, writing has always been a passion of mine. I would find joy in editing my friends' and family's works of writing. I would create short stories and eagerly read them out loud to entertain guests at social gatherings, which they would take great joy in listening to. As a staff writer now for the Rho Chi Post, I am excited to merge the knowledge I have gained in pharmacy school with my love for writing to create thought-provoking pieces for our community to read. Since pharmacy is an ever-evolving profession, it is important for our community to stay informed on the latest events in our field and I am looking forward to playing a small part in that as a member of the incredible editorial team.

Noor-ul-ain Buksh

Engagement & Outreach Manager



I am incredibly grateful to be serving as an Engagement and Outreach Manager for the Rho Chi Post. As someone who has frequently seen people silenced in the media, I strongly feel that it is important that our newsletter displays diverse perspectives on pharmaceutical topics and I hope to play a meaningful part in helping that happen. Oftentimes, it is easy to lose connection with the student community. I want to avoid that and prioritize the opinions of our readers and writers. While upholding the Rho Chi Post's mission, I plan to work my hardest to promote inclusivity and stay connected with the student body. The pharmaceutical world is never static so I am excited to learn and work alongside my peers.

Anjali Thykattil

Engagement & Outreach Manager

I am beyond grateful for this opportunity, and I am excited to have the honor of serving on the executive board as the Engagement and Outreach Manager. The Rho Chi Post is not only a creative outlet for students, but also one that is invariably relevant to the ever-changing world of healthcare. In this position, I aim to further expand the growth of the Rho Chi Post among pharmacy students here at St. John's. Let's not forget, it is us as students who will become the healthcare leaders of tomorrow.

Rukhsar Farheem

Social Media Manager

I am beyond honored and excited to serve on the executive board as Social Media Manager. Since my first year of pharmacy school, I always knew I wanted to be a part of the Rho Chi Post and contribute to this excellent platform, as it allows students, faculty and alumni to share their knowledge and insights on the current events in the pharmacy world. I love how this organization provides multiple mediums to voice our opinions and explore our interests in the various aspects of pharmacy. Since high school, I have been a social media enthusiast and have participated activities revolving around graphic design. I'm excited to see this organization continue to grow, and I hope that I can encourage more students to join and contribute to the Rho Chi Post.

Advisors

Elsen Jacob

PharmD, MS, BCPS, BCGP, CPPS

As the faculty advisor for the Rho Chi Society and the Rho Chi Post, I've had the opportunity to work closely with exceptional students who have a genuine passion for learning, service, leadership, and innovation. I look forward to what Rho Chi will accomplish this year!

Joseph Etzel

PharmD

Dr. Joseph Etzel is serving as the Rho Chi Post's interim faculty advisor for the 2022-2023 academic school year. Dr. Etzel is not new to our organization, as he has previously served as the faculty advisor for the Rho Chi Honor Society. He has been a huge influence to the success of Rho Chi in the past, and we look forward to working with him this year!

Mohammad Rattu

PharmD, BCOP, BCPS, BCGP

I am thankful to have been the 2012 Editor-in-Chief of the Rho Chi Post newsletter, as well as on the 2019 alumni honor roll of the national Rho Chi organization. This is one of the most successful longitudinal projects at my alma mater, as evidenced by its decade-long persistence and teams of highly-motivated students. I remain available for professional support and assistance with the new year's initiatives.

Meet Our 2022-2023 Rho Chi Executive Board

Executive Board

Vassilia Plakas
President

Rho Chi represents academic excellence, professional development, and service to our younger peers and fellow colleagues. Our programs and events reflect the value of scholastic leadership. Being part of Rho Chi has been such a wonderful experience so far; I am humbled and grateful to work with a strong executive board and a dedicated fifth year class.

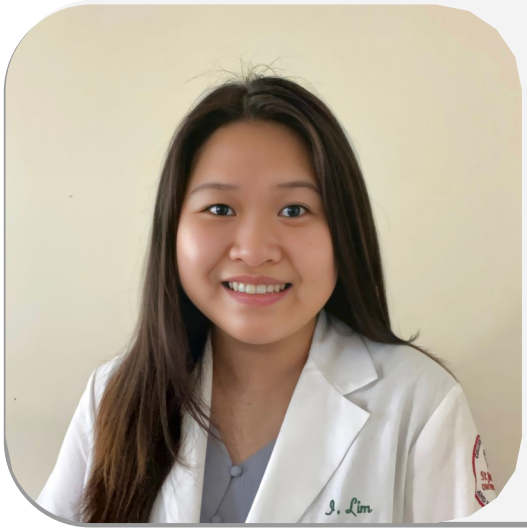
Frances Alexis Dela Cruz
Vice President

Rho Chi is a community that promotes academic excellence and service to others. By providing academic assistance and professional development opportunities, we strive to foster a supportive space for our members and younger peers to succeed. Rho Chi has played a significant role in my pharmacy journey thus far, and I am honored and humbled to be a part of this organization.

Rachel Kneitel

Secretary

Rho Chi to me is a collaborative space where students can encourage and support each other to excel. This organization allows students to spark stimulating conversations about pharmacy and healthcare as a whole.



Isabelle Lim

Treasurer

Rho Chi serves as an opportunity for students to academically support and collaborate with one another. Over the years, I personally have come to appreciate Rho Chi's study materials and review sessions as an integral resource when preparing for exams. I am honored to be a part of Rho Chi in a way where I can help other students just as Rho Chi has helped me in previous years.

Amanda Schleider

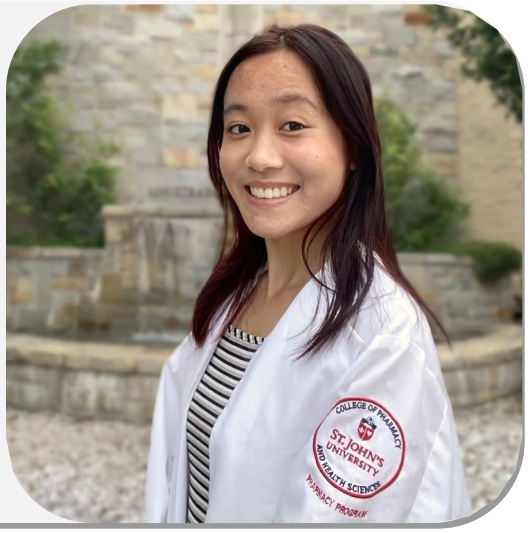
Historian

As the top students in our class, we have a unique opportunity to help our fellow classmates and younger pharmacy students succeed. This is a challenging program, and we all want to get through it. I am proud to be part of an organization that values assisting pharmacy students with their studies and connecting them with alumni and faculty members at our famous coffeehouse chats!

Joanne Fung

Development & Outreach Coordinator

To me, Rho Chi is a great opportunity for all pharmacy students to advance themselves. This society offers something to everyone, whether you are a member of the society, a part of the newsletter staff, or a student taking advantage of the resources offered by Rho Chi. The effort put forth by every person affiliated with Rho Chi is amazing, and I will always appreciate this society's mission and values.



Shankun Lin

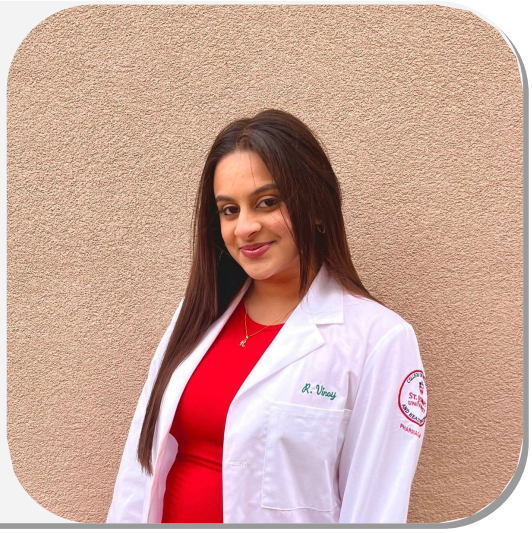
Academic Committee Coordinator

Rho Chi is an honor and an accomplishment that I am proud of. As a Rho Chi member, we should be humble and give back to our community for intellectual and professional success.

Riya Vinoy

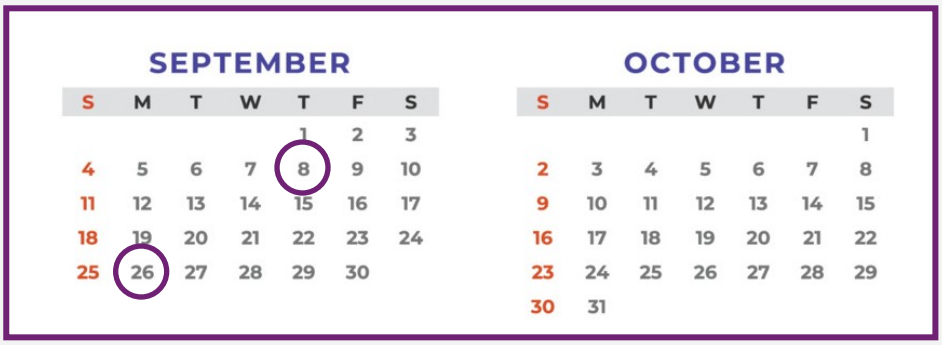
Academic Committee Coordinator

Rho Chi is a collaboration of individuals that are committed to advancing the field of pharmacy that recognizes and promotes intellectual leadership. This collaboration fosters the growth of intellectual leaders by providing resources that can assist in achieving academic excellence.



RHO CHI post

Mark Your Calendars!



Sep. 8th: **Activities Fair**

Sep. 26th: **RCP Informational**

Oct - TBT: **Writing Workshop**

Interested in writing for the Rho Chi Post?

Go to http://rhochistj.org/RhoChiPost and click on the login option from the menu bar to make an account! With an account, you'll have access to the article submission portal where you can submit your writing for publication in an upcoming issue!

Remember, you do NOT have to be a member of Rho Chi, a member of the editorial team, or a student of St. John's to write for our newsletter!

Interested in joining our Editorial Team?

The Rho Chi Post currently has positions open for staff writers, staff editors, and content-focused copy editors. Scan the QR Code below to learn more about these positions and to apply for a spot on our editorial team!