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Continuing Education

5 — *CE for Pharmacists & Technicians:* **Gene Therapies in Sickle Cell Disease: Review Article**

Letter From the Editor

4 — **Greetings from the Incoming *Journal* Editor**

Features

3 — *UpFront:* **Going Back to Places You Haven't Been in a Long While**

Meeting Recap

28 — **2025 PSW Legislative Day Recap**

Original Work

9 — **Prevalence and Intensity of Impostor Phenomenon in PGY1 Pharmacy Residents**

13 — **Post-Operative Antiemetic Use in Surgical Patients on Injectable GLP-1 Receptor Agonists**

19 — **A Cost Savings Quality Improvement Assessment of Rasburicase Dosing for Tumor Lysis Syndrome**

23 — **Preceptor Preferences: Optimizing Pharmacy Experiential Education Site Visits**

Spotlight

32 — **Business Member Spotlight: William Peppard**

The Journal of the Pharmacy Society of Wisconsin

The Journal of the Pharmacy Society of Wisconsin is a professional publication for original research, review, experience, and opinion articles that link science with contemporary pharmacy practice to improve patient care. Together we can inspire each other to advance our profession with the single purpose of enhancing the lives of our patients.

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Up Front: Going Back to Places You Haven't Been in a Long While

by Ryan Miller, PharmD, BCPS

It's been a busy few months, and it's wild to realize that my presidential term is already about half over. I know we're all out there, working very hard in a multitude of challenging situations to serve our patients and our communities. Amid all this activity, though, I think it's incredibly important for us all to do some reflecting on where we are, personally and professionally, as we enter spring, a time of annual renewal.

I haven't attended an American Pharmacists Association (APhA) national meeting since I was a student, but out of a combined sense of curiosity and the novelty of this year as an excuse, I made the effort to attend the APhA meeting in Nashville this spring. While I had a lot of fun, what I found to be the most striking part of the experience was a strong reinforcement of something I've been a loud advocate for over my career. It was a space for professional connection with friends, and for likeminded colleagues to connect and support each other, even though they don't see each other very often. Something as simple as a chance meeting with friends, former classmates, or professors you haven't seen in ages can truly be revitalizing.

Something I very firmly believe is that the value people find in organizations comes not only from the shared values, vision, and work that organization does, but also largely from the people in that organization. My encouragement to everyone in the coming months is to create the opportunity for yourself to find the people and the space you need to keep yourself sharp and growing and to help keep your professional and emotional cups full. Your colleagues and patients are counting on you, and they deserve the best you can deliver. If you haven't been to a meeting in a while, make an excuse to go. I'll shamelessly plug attending the PSW Annual Meeting in August. Meet up with people you haven't seen in years (or people you have), share a meal with them, laugh and share your burdens. Those are the moments that really fill me up and that I believe make us organizationally and individually great.

I've been incredibly fortunate to have the opportunity to be intimately involved in PSW in both appointed and elected leadership positions over the years. I've met so many people who are doing so many incredible things. As I've spent time thinking about all these relationships that I've had the privilege of being a part of, I realize that what I want most is for every pharmacy professional in Wisconsin to have similar opportunities to forge similar connections. It's truly been the greatest part of this journey for me and why I can say, without any reservation, that you and those like you are what makes PSW what it is, and what makes PSW great. That's true for the thought leaders who were here when PSW was created almost 30 years ago and built the foundations of what we are today; those who are currently trying to do the same for those 30 years from now; or those aspiring to be the leaders and the faces of the PSW of tomorrow. The challenges of working in pharmacy today are many, and it can sometimes feel like more than you can bear. You're not bearing it alone, though. Give yourself the permission you need to take care of yourselves and each other, and let's make the upcoming spring and summer the best they can be.

Ryan Miller is the President of the Pharmacy Society of Wisconsin in Madison, WI.

Letter to the Editor

Greetings from the Incoming *Journal* Editor

by Kate Rotzenberg, PharmD, MBA, BCPS

Hello there, reader! Perhaps this is your very first issue of the Journal, or perhaps you are a long-time reader or even a contributor. No matter where you are in your PSW journey, I'm excited to be on it with you in this new role as *The Journal's* Pharmacist Editor.

Let's start with a short biography (which is also a case study in the smallness of the world of pharmacy). I graduated from the University of Wisconsin-Madison School of Pharmacy, then completed a PGY1 residency at SSM Health St. Mary's Hospital. I was fortunate enough to stay on after residency as a clinical staff pharmacist, followed by a drug information pharmacist position and eventually management. It was at St. Mary's that I was mentored by the PSW powerhouses Russ Jensen and Kathy Skibinski, who were my role models in professionalism and integrity. Michael Nagy, the outgoing *Journal* Pharmacist Editor, was one of our APPE students during my time there, and I remember his enthusiasm well. In 2017, I transitioned to an academic role at the University of Wisconsin-Madison School of Pharmacy. I am currently a Teaching Associate Professor within the Social and Administrative Sciences division, teaching in the areas of healthcare ethics, financial management, medication safety, and pharmacy law.

As the incoming *Journal* Editor, I am particularly looking forward to strengthening the partnerships with PSW that have been building since 2007 when I joined as a pharmacist member during my residency. In addition to frequent conference attendance and presentations, I have served as a member of the Editorial Advisory Committee and the Diversity, Equity, and Inclusion Working Group, and as administrator of the PearlRx practice-based research network in collaboration with the Sonderegger Research Center for Improved Medication Outcomes. I am also honored to share that I was a co-recipient of the Curtis A. Johnson Award in 2018 (although my colleagues Mindy Bauer and Shab D. Sahebi really just pulled me along for the ride).

I am deeply appreciative of Michael's guidance during this transition; he has been responsive to my wide-ranging inquiries, patient with my many questions, and conscientious in making decisions and providing feedback. I am grateful to have gotten to know him better during this time. I see now that he is exactly the kind of person to lift up the voices of our pharmacy community, and we are lucky to have had him in this position as long as we did. I am also incredibly grateful to the PSW staff, who have been so welcoming!

Even in this short time, I am already thoroughly impressed with the quality of work I have seen—not only the written aspect of these manuscripts, but the actual impacts that the profession of pharmacy is making on a daily basis. Your contributions to *The Journal* positively influence how patient care is provided across the state and illustrate why we are "pharmacy proud" in Wisconsin. If you have thought about submitting a manuscript but weren't sure where to begin, please reach out! PSW is here to support you and help you be successful. PSW's Emerging Writers Course is a great resource for getting started.

If you'd like to be involved in *The Journal* in a different way, we are always accepting new peer reviewers to provide feedback on manuscripts prior to publication. More information about this role and a survey to submit interest are posted on *The Journal* website. In addition, the Editorial Advisory Committee (EAC) is accepting nominations for new members. EAC members meet two to three times per year to provide strategic direction to *The Journal* and also contribute to peer reviews. Check out the Self-Nomination Portal on the PSW website if you are interested!

I am so honored to have this opportunity to serve PSW and Wisconsin pharmacy as your *Journal* Pharmacist Editor. From new readers to long-time contributors alike, let's all continue this journey together and keep making a difference!

Kate Rotzenberg is the Pharmacist Editor of *The Journal of the Pharmacy Society of Wisconsin*.

Click here for more information about our the Peer Reviewer role and to fill our the interest form.

Continuing Education

PHARMACIST & TECHNICIAN CE:

Gene Therapies in Sickle Cell Disease: Review Article

by Anthony E. Rende, 2026 PharmD Candidate, Kevin A. Look, PharmD, PhD

Abstract

This article reviews sickle cell disease treatments with an emphasis on newly approved gene therapies. It examines the patient journey to achieving a potential cure with gene therapy while addressing its barriers. Additionally, it explores pharmacoeconomic considerations and the payer landscape, both of which play a large role in patients' access to these groundbreaking therapies.

Existing Treatments for Sickle Cell Disease

Approximately 100,000 people with sickle cell disease (SCD) live in the United States. Of those, over 90% affected identify as African American.[1] Individuals carrying this condition have a life expectancy that is 20 years shorter than the national average. SCD is a genetic disorder where red blood cells become sickle shaped and clump together, which can lead to blockages in blood flow, also known as vaso-occlusive crises. Vaso-occlusive crises are episodes that can cause severe pain or possible organ damage, as well as other serious complications due to a lack of oxygen-rich blood reaching the tissues. These complications can include leg ulcers, priapism, stroke, tissue death, kidney disease, and more.[2] Pain management can include the use of opioids, prescription pain medications, over-the-counter analgesics, and anti-inflammatory medications to help alleviate symptoms.

People with SCD would ideally be cared for by hematologists, but they are commonly seen by generalists, emergency nurses, and hospitalists who generally lack the expertise needed to handle this complex condition. Studies also suggest that healthcare providers may have more negative attitudes and increased frustration towards patients with SCD. Another survey found that only 20% of family physicians felt confident treating SCD.[3]

Available treatments to date are scarce, and until 2017, only a single medication—hydroxyurea—was available as a disease-modifying option. Hydroxyurea reduces red blood cell sickling and increases fetal hemoglobin. This drug is the first-line therapy and most prescribed medication for SCD. The main treatment effect involves lowering the number of vaso-occlusive crises. Despite the benefits of this medication, it is significantly underprescribed in eligible children and adults, partly due to societal factors such as mistrust in healthcare, stemming from historical and ongoing disparities.[2]

Other treatments include crizanlizumab and L-glutamine. Both of these medications are often reserved as second-line therapies or as adjunct for those not adequately responding to hydroxyurea alone. Crizanlizumab, approved in 2019, works against p-selectin, which may be involved in causing pain crises. L-glutamine, approved in 2017, is an amino acid supplement that can lower the amount of clumping and sickling of red blood cells.[2] Voxelotor was recently withdrawn from the market by Pfizer after almost 5 years, with the manufacturer stating that the "overall benefit no longer outweighs the risk." The decision was based on data suggesting an imbalance between vaso-occlusive crises and fatal events.[4] The high cost of these therapies also presents a challenge, with estimated annual net costs of $96,354 for crizanlizumab, $92,584 for voxelotor, and $30,046 for L-glutamine, according to a 2020 Institute for Clinical and Economic Review (ICER) report.[5] This in turn leaves even fewer options for SCD patients, highlighting the need for innovative therapies.

For very severe forms of SCD, blood transfusions can be utilized as needed. However, transfusions come with notable

CE FOR **PHARMACISTS & TECHNICIANS**

Learning Objectives

- Identify the current available treatment options for sickle cell disease and their limitations
- Describe the patient journey for receiving gene therapy for sickle cell disease
- Explain pharmacoeconomic and payer landscape challenges affecting access to gene therapies for sickle cell disease

risks, such as iron overload, and necessitate hospitalizations. SCD-related hospital admissions have increased over time. Patients with SCD frequently require inpatient care, and the total estimated costs of SCD are around $2.98 billion per year in the US.[2,3,6]

Before the arrival of gene therapies, the only possible cure was a hematopoietic stem cell transplant (HSCT). The main issue with an HSCT is finding an optimal donor. It is estimated that, at best, someone with SCD has a 25% chance of matching with a donor. For ethnic minorities, the chances are even lower—only between 6%and 10% of finding someone through a U.S. registry. Additionally, HSCT introduces the risk of graft-versus-host disease where the donor's immune cells attack the recipient's body. These findings emphasize the importance of developing alternatives.[2,7]

TABLE 1. Comparative Overview of Sickle Cell Disease Treatments

Treatment	Type	Key Benefits	Key Limitations/Challenges
Hydroxyurea	Oral Medication	Reduces frequency of pain crises and hospitalization	Underused, Requires ongoing administration
L-glutamine	Amino acid supplement	Reduces frequency of pain crises	Requires ongoing administration
Crizanlizumab	Monoclonal antibody	Reduces frequency of pain crises	Requires ongoing administration
Bone Marrow Transplant	Stem cell transplant	Potentially curative	Requires matching donor, significant risks of toxicity
Exagamglogene autotemcel	Gene therapy (CRISPR/Cas9)	Potentially curative	High cost, long-term efficacy unknown, intensive treatment, limited availability, requires extensive evaluation and support system
Lovotibeglogene autotemcel	Gene therapy (lentiviral vector)	Potentially curative	High cost, long-term efficacy unknown, intensive treatment, limited availability, requires extensive evaluation and support system

CRISPR: Clustered Regularly Interspaced Short Palindromic Repeats, Cas9: CRISPR-associated protein 9

Emerging Treatments for Sickle Cell Disease

While traditional treatments have helped with managing SCD, they fall short of offering a cure. However, recent significant advancements have been made in curing SCD through gene therapies, specifically with two new Food and Drug Administration (FDA)-approved treatments: exagamglogene autotemcel (Casgevy®) and lovotibeglogene autotemcel (Lyfgenia®).[8,9]

Gene therapies aim to offer a one-time cure by fixing the genetic defect at the root, unlike traditional therapies, which are used to manage symptoms. Despite their promising outcome, gene therapies have disadvantages. They are expensive, difficult to access, and don't have well-established safety profiles.[10,11]

Exagamglogene autotemcel, developed by Vertex Pharmaceuticals, became the first FDA-approved gene therapy for SCD in late 2023. Exagamglogene autotemcel uses CRISPR/Cas9 gene editing to increase hemoglobin in stem cells. This is accomplished by editing and inactivating the BCL11A gene. In a phase 3, single-group, open-label trial, 30 patients aged 12 to 35 received the therapy and were followed for at least 16 months after infusion. Baseline characteristics included 53% male and 87% Black participants. Of the 30 patients evaluated, 29 remained free from vaso-occlusive crisis-related hospitalizations ($P<0.001$). The safety profile was comparable to myeloablative conditioning, with most common adverse events including stomatitis (55%) and febrile neutropenia (48%) and no cases of cancer or graft failure.[8]

Lovotibeglogene autotemcel was later developed by Bluebird Bio. It uses a lentiviral vector to insert a functional hemoglobin gene into stem cells, which increases hemoglobin levels. In a phase 1–2 study, 35 patients received therapy with a median follow-up of 17.3 months. Baseline characteristics included a median age of 24 years old, 37% female, and 97% Black. For all 25 evaluated patients, there was complete resolution of severe vaso-occlusive events. The safety profile was also consistent with myeloablative conditioning. The two most common adverse events were stomatitis (69%) and thrombocytopenia (66%). No cases of hematologic cancer were noted.[9]

Both SCD gene therapies take different approaches but share the same goal of offering a one-time cure. The long-term risks remain uncertain, and it will take years of monitoring to truly understand the safety and effectiveness beyond clinical trial data.[12]

Patient Experience and Barriers to Accessibility

Patients seeking SCD gene therapy may experience a complex and demanding journey. Both therapies are approved for patients 12 years and older with SCD. Lovotibeglogene autotemcel is indicated for those with a history of vaso-occlusive events, and exagamglogene autotemcel is specifically approved for patients with recurrent vaso-occlusive crises.[13,14]

Patients eligible for either gene therapy follow a process including screening, stem cell collection, chemotherapy, infusion, and post-treatment monitoring. Before collection, patients receive red blood cell transfusions to reduce sickled hemoglobin levels. For exagamglogene autotemcel, stem cells are collected over 2 to 3 days, while lovotibeglogene autotemcel requires bone marrow harvesting under anesthesia. Both therapies utilize a four-day myeloablative conditioning course to eliminate existing bone marrow cells. The modified cells are then infused after chemotherapy. Patients remain hospitalized for approximately 1 month for engraftment monitoring and supportive care.[8,9]

Access to SCD gene therapies is a major challenge. They are limited to specialized medical centers because of the expertise and resources required for procedures. Additionally, the process requires a strong support system for the physical and emotional challenges patients face. It also demands significant financial resources due to inpatient and outpatient costs.[15,16]

Payer Landscape and Pharmacoeconomics

Gene therapies for sickle cell disease can be prohibitively expensive, with exagamglogene autotemcel estimated to cost $2.2 million and lovotibeglogene autotemcel at $3.1 million per patient.[17] This does not include the cost of chemotherapy, hospital admissions, and medications that need to be taken after transfusion. The question of whether commercial insurance will cover these treatments has not yet been determined.[12] This uncertainty may stem from the concern for patients changing insurance plans. Payers who cover a one-time treatment with high upfront costs might not see any downstream cost savings if a patient switches plans. This issue makes commercial payers less likely to commit to treatment coverage, as they have a high potential to miss out financially on the long-term savings of this treatment. Even if the treatment is deemed cost effective, insurance agencies may still decide to opt out due to prioritizing short-term budgeting.[18]

ICER assumed that lovotibeglogene autotemcel and exagamglogene autotemcel would be equally effective based on the small number of patients studied so far. ICER generates a Health Benefit Price Benchmark (HBPB), a value representing the estimated cost of a treatment when taking its health benefits into account. This benchmark helps determine whether the treatment price accurately reflects its health improvements. ICER's HBPB for either therapy ranges between $1,350,000 and $2,050,000. Although actual prices for these treatments have not been determined, estimates suggest that the HBPB may be lower than the cost of the treatment. This indicates that the estimated price could exceed the value the therapy delivers in health outcomes, suggesting potential overpricing by manufacturers.[3]

SCD disproportionately affects non-Hispanic Black and African Americans with roughly 50% to 60% relying on Medicaid for their healthcare coverage. As a result, it is crucial to consider whether government programs, such as Medicaid and the Children's Health Insurance Program, will cover treatments, as extremely high costs could restrict access to therapy and result in worse health outcomes.[19]

The government is currently taking steps to make gene therapies more accessible and affordable through the Cell and Gene Therapy (CGT) Access Model. The CGT Access Model is a form of value-based contracting designed to simplify the Medicaid coverage of gene therapies by using outcome-based agreements to control costs. In value-based contracting, drug prices are tied to their real-world performance. The Centers for Medicare & Medicaid Services will negotiate terms with pharmaceutical companies, including pricing and outcomes measures. States can choose whether to enter into these agreements and voluntarily participate in this model starting January 2025.[20,21] These discussions will have significant effects on coverage, access, and cost management, but continued efforts will be needed to ensure the individuals who need these therapies the most can obtain them.

Although the CGT Access Model doesn't provide funds for gene therapy, it creates a framework that supports states to cover these treatments by negotiating better prices and managing costs through outcome-based agreements. The model's ultimate aim is to help Medicaid programs afford cutting-edge gene therapies. Medicaid will not benefit from the long-term savings of the cured condition if a patient switches to commercial or private insurance.[14]

Other Limitations

In addition to high costs and insurance coverage limiting accessibility, as mentioned earlier, many patients with SCD are not regularly managed by hematologists, making it difficult to ensure access to treatment. Beyond this, one major concern is the potential for serious adverse events such as cancer. For patients less than 12, parents may be hesitant to take advantage of gene therapy because of these risks. Additionally, the treatment process itself requires a long period of hospitalization, which can lead to more problems. Increasing the availability of the treatment to meet demand remains a significant challenge, and initial uptake of these therapies is expected to be slow due to accessibility barriers.[3]

Conclusion

As summarized in Table 1, treatment options for SCD range from disease-modifying therapies to recently approved gene therapies, each with its own set of benefits and limitations. Gene therapies mark a major breakthrough in the treatment of SCD. They offer hope for a cure to a condition that causes chronic pain, poorer quality of life, and shorter life spans. These treatments could drastically change the lives of people living with SCD. However, barriers such as limited production, restricted insurance coverage, and location-based administration constraints must be overcome to make these therapies available to all patients who need them. As we continue to monitor the therapies' long-term effectiveness and safety, it will be essential to address these barriers, especially those related to insurance coverage and healthcare costs. With continued progress, a cure for SCD may be reached.

Anthony Rende is a 2026 Doctor of Pharmacy Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. At the time this article was written, Kevin Look is an Assistant Professor at the University of Wisconsin-Madison School of Pharmacy in Madison, WI.

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Assessment Questions

1. Which of the following is considered a first-line disease-modifying treatment for sickle cell disease?
   a. Crizanlizumab
   b. L-glutamine
   c. Hydroxyurea
   d. Exagamglogene autotemcel

2. Which of the following is a major limitation of bone marrow transplants for sickle cell disease?
   a. Iron overload
   b. High cost
   c. Underprescribed in children
   d. Difficulty finding suitable donors

3. Which of the following treatments were recently withdrawn from the market?
   a. Voxelotor
   b. L-glutamine
   c. Lovotibeglogene autotemcel
   d. Crizanlizumab

4. Before receiving the newly treated cells, the patient must first:
   a. Undergo bone marrow transplant
   b. Receive chemotherapy
   c. Take hydroxyurea for at least 12 months
   d. Fail treatment with exagamglogene autotemcel

5. **True or False:** Patients undergoing treatment with either lovotibeglogene autotemcel or exagamglogene autotemcel must undergo a four-day myeloablative conditioning regimen before receiving their modified stem cells.
   a. True
   b. False

6. What is the estimated cost of exagamglogene autotemcel for a single patient?
   a. $500,000
   b. $1.2 million
   c. $2.2 million
   d. $3.1 million

7. What could be a reason why insurance payers are hesitant to cover gene therapy for SCD?
   a. Gene therapies have a high failure rate
   b. Patients may switch insurance plans
   c. Medicaid will never allow coverage for gene therapies
   d. Special handling including shipping and storage

8. **True or False:** The Cell and Gene Therapy (CGT) Access Model is a funding program designed to pay for gene therapy in Medicaid patients.
   a. True
   b. False

9. The Institute for Clinical and Economic Review (ICER) estimated the Health Benefit Price Benchmark (HBPB) for gene therapies for SCD at:
   a. $500,000 - $1,000,000
   b. $1,350,000 - $2,050,000
   c. $2,500,000 - $3,500,000
   d. $4,000,000+

CE FOR **PHARMACISTS & TECHNICIANS**

Continuing Education Credit Information

The Pharmacy Society of Wisconsin is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. Continuing education credit can be earned by completing the self assessment questions. Questions may be completed online. Participants receiving a score of 70% or better will be granted 1 hour (0.1 CEU) credit through CPE Monitor. Accurate birth date (MMDD) and CPE Monitor ID must be provided in order to receive this credit as required by ACPE. This CE offering is offered free-of-charge to all PSW members. Nonmembers are charged $25.

May/June 2025
Gene Therapies in Sickle Cell Disease: Review Article

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Prevalence and Intensity of Impostor Phenomenon in PGY1 Pharmacy Residents

by Alyssa K. Kuhn, 2025 PharmD Candidate, Katherine P. Davis, 2025 PharmD Candidate, Scott Nei, PharmD, BCPS, BCCCP

Abstract

Introduction: Healthcare professionals endure rigorous coursework that is often followed by postgraduate training programs. Postgraduate year one (PGY1) training programs are demanding; therefore, providing well-being resources to residents is a necessity. This need is recognized by national organizations with well-being training resources, but few mention details about impostor phenomenon. Impostor phenomenon is frequently found in high-achieving and highly educated individuals, including pharmacy residents.

Objective: The primary objective of this study was to determine the prevalence and intensity of impostor phenomenon in PGY1 residents in programs across the country.

Methods: In September 2023, emails containing a survey and description of the study were sent to 1,602 PGY1 residency program directors (RPDs). The survey, conducted via Qualtrics, inquired about demographics and impostor phenomenon characteristics. It consisted of 27 questions, 20 of which were the Clance Impostor Phenomenon Scale (CIPS).

Results: A total of 704 current PGY1 residents responded to the survey. Over half of the respondents (52.4%) reported having frequent characteristics or experiences of impostor phenomenon. Only 3.4% of residents were found to have few characteristics or experiences of impostor phenomenon. All five types of impostor phenomenon are represented by this sample of residents, with the most common selection "the perfectionist" (40.9%).

Conclusions: The findings of impostor phenomenon in PGY1 residents in this study, in combination with the breakdown of impostor phenomenon types, warrant further research and discussion. Residency programs and national organizations should consider incorporating impostor phenomenon awareness into their well-being programs.

Impostor phenomenon is increasingly being studied in college students and healthcare practitioners.[1] People who experience impostor phenomenon have feelings of self-doubt and a lack of competency. Some describe an internal experience of intellectual doubt despite objective evidence of numerous accomplishments.[2] This phenomenon can lead to chronic mental health concerns, as well as a significant impact on job performance and satisfaction.[3] Impostor phenomenon is more prominent in high-achieving and highly educated individuals.[4] It has been theorized that physicians who experience impostor phenomenon have overvalued their profession and are among very accomplished colleagues.[5] These hypotheses can translate to pharmacy professionals, as current evidence shows that impostor phenomenon is prevalent among pharmacy students. One study of pharmacy residents reported higher prevalence among residents who worked more than 80 hours per week on average and who had received prior mental health treatment.[1] Efforts are being made to combat imposter phenomenon in new pharmacy practitioners.[6] The American Society of Health-System Pharmacists (ASHP), the national accreditation body for pharmacy residencies, has prioritized promoting well-being.[7] As the profession grows, with well-being as a priority, there is also a need to better understand the impact of impostor phenomenon among first-year residents across the nation.

There are five types of impostor phenomenon as defined by the Impostor Syndrome Institute.[8] The types include "the soloist," who prefers to work alone and is unlikely to ask for help for fear of judgement; "the natural genius," who focuses on ease and speed of mastering a subject with the feeling of failure when faced with difficulty; "the perfectionist," who fixates on their mistakes and feels that one minor flaw equates to failure; "the expert," who feels they are expected to know everything and that one gap in knowledge leads to failure; and "the superhero," who takes on many roles and feels that falling short in a role results in failure. Understanding the prevalence and types of impostor phenomenon in PGY1 pharmacy residents will enhance the existing evidence of impostor phenomenon within this highly educated healthcare group. Uncovering the common types of impostor phenomenon among residents may help guide future resources and mitigation strategies. The primary objective of this study was to determine the prevalence and intensity of impostor phenomenon in PGY1 residents in programs across the country. Secondary aims included discovering a correlation between impostor phenomenon in women and other minorities and determining the association between PGY1 residents and the five types of impostor phenomenon (soloist, perfectionist, natural genius, expert, and superhero). Of note, the phrases "impostor syndrome" and "impostor phenomenon" are commonly used throughout literature and are considered synonymous.

Methods

This survey study examined the demographics and impostor phenomenon characteristics of postgraduate year one (PGY1) pharmacy residents across the United States. The survey consisted of 27 questions, 20 of which included the Clance Impostor Phenomenon Scale (CIPS).[9] The CIPS is an ordinal scale (not at all, rarely, sometimes, often, and very true) that measures the level of impostor phenomenon characteristics (few, moderate, frequent, or often has impostor phenomenon experiences) based on 20 questions. The score assigned by the scale correlates with the intensity of impostor phenomenon characteristics. This scale was used with permission from creator Pauline Rose Clance, PhD, ABPP. A score cutoff of ≥ 62 is identified in the literature to reliably differentiate impostors versus non-impostors. This scoring tool has been validated through literature comparing CIPS with the more recent Perceived Fraudulence Scale (PFS). The CIPS and PFS were found to be significantly correlated ($p \leq 0.1$), validating their use as scoring tools for imposter phenomenon.[10] The Qualtrics survey was anonymous, and participation was voluntary; no incentives were provided. An email containing instructions, the study's purpose, and a link to the survey was sent to all residency program directors (RPDs) found in the ASHP directory. RPD email addresses were obtained from the ASHP directory or the health system's residency information website. The initial email was sent on September 15, 2023, a reminder email followed on October 1, 2023, and both emails included a response deadline of October 15, 2023. RPDs were asked to share the survey with their current PGY1 resident class at their discretion.

The study sample included all 4,099 PGY1 pharmacy residents matched through ASHP Phase I and II for the 2023-2024 cycle in the United States.[11] Demographic information (gender, race/ethnicity, and educational background), residency program information (location and number of PGY1

TABLE 1. Resident Demographic Characteristics and Residency Program Characteristics

Characteristics	*Residents (%)*	*Average Imposter Phenomenon Score**
Number of Residents	704	69.1 (Frequent)
Gender		
Female	538 (76.4)	70.2 (Frequent)
Male	156 (22.2)	64.6 (Frequent)
Nonbinary	8 (1.1)	82.0 (Often)
Prefer Not to Disclose	2 (0.3)	73.0 (Frequent)
Race/Ethnicity*		
White	531 (75.4)	69.0 (Frequent)
Black/African American	41 (5.8)	70.9 (Frequent)
Asian	123 (17.5)	69.9 (Frequent)
American Indian/Alaska Native	4 (0.6)	65.5 (Frequent)
Native Hawaiian/Other Pacific Islander	2 (0.3)	69.5 (Frequent)
Hispanic/Latino/Spanish Origin	42 (6.0)	68.1 (Frequent)
Multiracial	52 (7.4)	71.9 (Frequent)
Prefer Not to Disclose	10 (1.4)	68.0 (Frequent)
Other	11 (1.6)	82.6 (Often)
Education*		
Doctor of Pharmacy (PharmD)	697 (99.0)	69.2 (Frequent)
Doctor of Philosophy (PhD)	2 (0.3)	64.0 (Frequent)
Other Professional Degrees (JD, MD, etc.)	1 (0.1)	56.0 (Few)
Master's Degree	64 (9.1)	68.5 (Frequent)
Bachelor's Degree	442 (62.8)	69.2 (Frequent)
Associate's Degree	11 (1.6)	73.6 (Frequent)
1+ Degree	464 (65.9)	69.1 (Frequent)
Region of Residency Institution		
West	88 (12.5)	69.9 (Frequent)
Midwest	253 (35.9)	69.2 (Frequent)
Southwest	45 (6.4)	67.5 (Frequent)
Southeast	212 (30.1)	68.6 (Frequent)
Northeast	106 (15.1)	69.9 (Frequent)

**Reference Table 2 for details on the level and scoring of Impostor Phenomenon*
***These questions had the possibility of more than one selection choice*

TABLE 2. Resident Clance Imposter Phenomenon Scale and Type of Imposter Phenomenon

Imposter Phenomenon Characteristics	*Residents (%)*
Clance Imposter Phenomenon Scale	
Few Imposter Phenomenon Characteristics/Experiences (score <40)	24 (3.4)
Moderate Imposter Phenomenon Characteristics/Experiences (score 41-60)	161 (22.9)
Frequent Imposter Phenomenon Characteristics/Experiences (score 61-80)	369 (52.4)
Often has intense Imposter Phenomenon Characteristics/Experiences (score >80)	150 (21.3)
Clance Imposter Phenomenon Scale	
The Soloist	91 (12.9)
The Expert	177 (25.1)
The Perfectionist	288 (40.9)
The Natural Genius	60 (8.5)
The Superhero	88 (12.5)

pharmacy residents within the institution), and impostor phenomenon characteristics were collected. The institutions' regions within the United States were determined based on National Geographic's definitions.[12] Postgraduate pharmacists were excluded if their postgraduate pharmacy training occurred through programs outside of the ASHP National Match Program (e.g., fellowships) and if the pharmacists were in their second postgraduate year (PGY2) of pharmacy residency training. This study used descriptive statistics to analyze the data provided through the CIPS.

Residents were asked to select the type of impostor phenomenon they identified with most closely in a multiple-choice question that included descriptions of the characteristics of each type. This study was submitted to the Mayo Clinic Institutional Review Board and was classified as exempt. The survey data was analyzed by two investigators, and the average impostor phenomenon score was calculated for comparison to the endpoints of interest.

Results

At the time of data collection, there were 1,602 PGY1 programs in the ASHP directory, and emails were sent to those RPDs. Excepted were 100 emails (6.2% of total RPD emails) that were not found in the ASHP directory or the institution's pharmacy residency website. The initial emails and the reminder emails resulted in 24 (1.5%) and 45 (2.8%) emails, respectively, that were undeliverable. In total, 704 PGY1 residents completed the survey out of 4,099 PGY1 residents, resulting in a 17.2% response rate (Table 1).

Out of the 704 respondents, the average impostor phenomenon score was 69.1 and the median score was 70, both of which indicate frequent feelings or experiences of impostor phenomenon. Residents who identified as nonbinary represented the minority of the sample at 1.1% but had the highest average impostor phenomenon score (82) of all genders. The majority of responses were from white individuals (75.4%), and all responses had a similar average impostor phenomenon score, indicating frequent experiences of impostor phenomenon. Almost all residents had earned a PharmD (99.0%), and 65.9% of residents had earned more than one degree. Higher response rates were observed in pharmacy residency institutions located in the Midwest (35.9%) and Southeast (30.1%), with all regions having an average score indicating frequent experience of impostor phenomenon.

After completing the survey, the majority of residents (52.4%) had a resulting score of frequent characteristics or experience of impostor phenomenon (Table 2). Conversely, only 3.4% of residents exhibited few characteristics or experiences of impostor phenomenon. All five types of impostor phenomenon were represented by this sample of pharmacy residents, with the most common being "the perfectionist" (40.9%) and the least common being "the natural genius" (8.5%).

Discussion

In a survey of 704 PGY1 pharmacy residents, frequent feelings of impostor phenomenon were reported across all demographics and geographical regions. This prevalence emphasizes the significance of the topic and importance of further research and discussion, along with well-being resources for residents. The majority of residents identified with "the perfectionist" (40.9%) or "the expert" (25.1%) as their "type" of impostor phenomenon. While previous literature has discussed the differences in impostor phenomenon among minority groups, the resulting data from this study showed that impostor phenomenon does not discriminate by race, ethnicity, or gender in PGY1 pharmacy residents.

Pharmacy residency programs are designed to align with ASHP standards for program accreditation, ensuring a rigorous training year for PGY1 residents. Over the past few years, there has been increased education on and awareness of well-being from ASHP and other national pharmacy organizations for residency programs. ASHP provides a well-being resource recognizing its importance during this critical year of training.[13] The findings of this survey suggest that increased discussion and awareness should be focused on impostor phenomenon. It may be hypothesized that it is important to educate first-year licensed pharmacists on resident well-being and impostor phenomenon to facilitate a smooth transition and improve mental health.

Pharmacists are known as medication experts, which can induce stress for residents as they try to fulfill this expectation. As members of the interprofessional team, residents participate in order verification, which is the final step between a prescriber order and the patient receiving the medication. This responsibility may contribute to the prevalence of "the perfectionist" and "the expert" as the most common types of impostor phenomenon, collectively accounting for 66.0% of responding PGY1 residents. A survey study of medical, dental, nursing, and pharmacy students from the Medical University of South Carolina evaluated perfectionism among these medical professional degrees.[14] The study found that pharmacy students were more likely to have socially prescribed perfectionism than holders of any other medical degree. This characteristic is shown to carry on throughout residency and promotes feelings of impostor phenomenon. Conversely, fewer residents identified with "the natural genius" (8.5%) type of impostor phenomenon. Cox and colleagues describe the left-sided thought process that is required for students throughout the doctor of pharmacy (PharmD) coursework.[15] This demonstrates that many pharmacy residents are confident in their technical skills to analyze clinical data, memorize drug information, and evaluate the pharmacokinetics/pharmacodynamics of a patient's regimen, which are core aspects of serving as a pharmacist on an interprofessional team.

A study conducted by Sullivan and colleagues in 2020 found that 57.5% of PGY1 and PGY2 pharmacy residents frequently or often experienced impostor phenomenon.[4] The current study found that 73.7% of residents frequently or often experienced impostor phenomenon. While this study resulted in a higher prevalence, the authors hypothesized that a rise in impostor phenomenon was the result of post-pandemic changes in school curriculum and structure. Between the Sullivan et al. study and this current study, students have been increasingly exposed to virtual learning environments and different methods of knowledge assessment. These variations in curriculum may decrease residents' confidence in clinical and communication skills with patients and the interprofessional team.

While these studies are only a few years apart, they have indicated an increase in the prevalence of impostor phenomenon. If this trend continues, there may be an urgent need for additional efforts to normalize and address impostor phenomenon to establish confidence in future pharmacists. The purpose of the PGY1 program is to establish the skill set necessary to make independent medication interventions on the interprofessional team to prepare for a PGY2 program or begin a career as a pharmacist.[16] Without certainty and courage, pharmacy residents may struggle to develop these competencies. A review of ASHP resources identified only one document specifically addressing impostor phenomenon in pharmacy residents, highlighting the need for further discussion and support on this issue.[17]

A limitation of this study was a low response rate among residents, at 17.2%. The low response rate is not dissimilar to pharmacy student survey research (12.6% response rate).[18] The demographics of respondents do represent recent graduating class demographics from colleges of pharmacy. Another limitation was the lack of generalizability of results among the small sample of minority populations. The majority of the sample were non-Hispanic (94.0%) white (75.4%) women (76.4%). While some minority groups showed an increase in the prevalence of impostor phenomenon, a greater representation of these populations is needed to confirm the results. Additionally, due to the lack of email addresses for programs, this study population does not include all possible programs, limiting our overall participant pool. A third limitation was system-blocked email addresses from external domains. Due to safety precautions, email addresses external to the institution were blocked in some cases, contributing to a lower participant pool. Additional limitations include framing bias, non-response bias, and baseline understanding of impostor phenomenon.

Conclusions

The findings of this study demonstrate the current prevalence of imposter phenomenon in pharmacy residents. When compared with a previous study, these findings suggest a steep increase in imposter phenomenon prevalence. The majority of residents chose "the perfectionist" (40.9%) or "the expert" (25.1%) as their types of impostor phenomenon. The breakdown of impostor phenomenon types warrants further action to combat the lack of confidence expressed by pharmacy residents. The pharmacy profession and interprofessional members of the healthcare team may benefit from a decline in impostor phenomenon characteristics in PGY1 residents that would enhance patient care.

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PR *This article has been peer-reviewed. The contribution in reviewing is greatly appreciated!*

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Original Work

Post-Operative Antiemetic Use in Surgical Patients on Injectable GLP-1 Receptor Agonists

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Abstract

Background: Glucagon-like peptide 1 receptor agonists (GLP-1 RAs) are commonly prescribed for diabetes and obesity management. These agents can delay gastric emptying and may cause nausea and vomiting as adverse effects. The implications of GLP-1 RAs on surgical outcomes, particularly anesthesia type, post-operative nausea and vomiting (PONV), and recovery, are not well defined. This study evaluates the impact of GLP-1 RAs on perioperative drug selection, anesthesia type, and antiemetic use during the post-operative period.

Methods: A retrospective chart review was conducted to analyze surgical patients on injectable GLP-1 RAs compared to a cohort not receiving these agents. Data collection included the type of anesthesia administered during surgery and antiemetic medications used post-operatively. Statistical analyses were performed to identify differences in anesthesia type and antiemetic use between the two groups.

Results: Patients on GLP-1 RAs exhibited a statistically significant difference in the type of anesthesia used during surgery compared to those not on GLP-1 RAs. Post-operatively, patients receiving GLP-1 RAs required more antiemetics; however, this increase was not statistically significant. These findings highlight potential modifications to anesthesia protocols and post-operative care for patients on GLP-1 RAs to address the drugs' known gastrointestinal side effects.

Conclusions: Patients on GLP-1 RAs undergoing surgery may require tailored perioperative management due to the drugs' impact on gastric emptying and associated nausea. Further research is warranted to validate these findings and explore the mechanisms driving the observed differences in anesthesia and recovery.

Glucagon-like peptide 1 receptor agonists (GLP-1 RAs) are the United States Food and Drug Administration (FDA) approved medications for the treatment of type 2 diabetes mellitus (T2DM) and medication-assisted weight loss.[1] The mechanism of action is multimodal; they increase glucose-dependent insulin secretion, decrease inappropriate glucagon secretion, and slow gastric emptying. These factors help improve glycemic control and promote weight loss. Agents in this class have a high prevalence of nausea as an adverse effect, ranging from 8% to 44% of patients as reported in the injectable exenatide, semaglutide, and dulaglutide prescription drug label.[2-4] This may impact several aspects of patient care, including surgery. One common side effect following surgery is post-operative nausea and vomiting (PONV), which may be exacerbated by GLP-1 RAs. Limited literature exists describing this relationship or the impact of GLP-1 RAs in the surgical population.

Prior studies and case reports have shown patients on GLP-1 RAs have increased residual gastric contents measured through esophagogastroduodenoscopy under deep sedation or general anesthesia prior to procedure compared to patients not on GLP-1 RAs despite fasting for the instructed time, from 18 to 24 hours.[5-7] One study reported 24.2% of patients on weekly injectable semaglutide had residual gastric contents versus 5.1% of patients not on GLP-1 RAs.[5] Concerns exist that increased residual gastric contents despite proper pre-operative fasting instructions can increase the risk of adverse effects such as aspiration following surgery. As a result, a consensus-based guidance statement from the American Society of Anesthesiologists (ASA) published in June 2023 recommends holding weekly injectable GLP-1 RAs at least 7 days prior to surgery for elective procedures, which is different from the previous standard of care of typically holding medications the day of surgery.[8] This guidance was implemented within this institution on July 1, 2023.

A recent systematic review and meta-analysis reviewed the impact on GLP-1 RAs and periprocedural management focusing on gastric emptying and reviewed a solid diet and liquid diet prior to surgery.[9] The study demonstrated an approximate 36-minute gastric emptying delay for patients on GLP-1 RAs on a solid diet measured through scintigraphy; however, this delay was not meaningful given that the standard pre-operative fasting guidance is typically much longer. In addition, the liquid diet showed no difference in gastric emptying. With these findings, it was recommended to continue GLP-1 RAs, follow a liquid diet a day prior to procedure, and utilize standard pre-anesthesia fasting guidance.

There remains a gap in the literature exploring post-operative recovery for patients on GLP-1 RAs. With potential residual gastric contents present in the stomach, the project team questioned whether anesthesia and antiemetic practices differ for patients on GLP-1 RAs versus those who are not.

This study's primary objective was to investigate PONV for patients on GLP-1 RAs, measured indirectly through antiemetic administrations for patients on GLP-1 RAs compared to those who were not on these agents. Additional secondary objectives were to evaluate antiemetic administration for patients on GLP-1 RAs before and after implementation of the ASA consensus statement recommending holding weekly injectable GLP-1 RAs at least 7 days prior to surgery for elective procedures (July 1, 2023) to assess the impact of the updated guidance; to review anesthesia type used to evaluate if there are differences in

Key Points

Question: How do injectable glucagon-like peptide 1 receptor agonists (GLP-1 RAs) impact anesthesia type, post-operative nausea and vomiting (PONV), and recovery in surgical patients?

Findings: Patients on GLP-1 RAs had a statistically significant difference in anesthesia type used during surgery and required more antiemetics post-operatively, though the latter was not statistically significant.

Meaning: Perioperative management of patients on GLP-1 RAs may require tailored anesthesia protocols and proactive strategies to address potential gastrointestinal side effects.

TABLE 1. Baseline Characteristics (n=2779)

Category		GLP-1 RA (N=105)	No GLP-1 RA (N=2674)	p-value
Average age (years), mean ± SD		64.1 ± 11.5	63.6 ± 18.7	0.79
Sex as officially documented in medical record	Male	61 (58.1%)	1248 (46.7%)	0.021
	Female	44 (41.9%)	1426 (53.3%)	
Ethnicity	Hispanic or Latino	1 (1.0%)	49 (1.8%)	0.74
	Not Hispanic or Latino	103 (98.1%)	2606 (97.5%)	
	Unknown	1 (1.0%)	19 (0.7%)	
Race	American Indian/ Alaskan Native	1 (1.0%)	20 (0.7%)	0.35
	African	0	1 (0.0%)	
	Asian (Chinese, Laotian, Other, Thai, Vietnamese)	1 (1.0%)	23 (0.9%)	
	Black or African American	2 (1.9%)	17 (0.6%)	
	Native Hawaii/Pacific Islander	0	4 (0.1%)	
	White	100 (95.2%)	2593 (97.0%)	
	Other	0	7 (0.3%)	
	Unknown	1 (1.0%)	9 (0.3%)	
Weight (kg)		106 ± 26	88.5 ± 24.2	<0.001
Diabetes diagnosis %		86 (81.9%)	546 (20.4%)	<0.001
Prior to admission antiemetic use (% yes)		0	144 (5.4%)	0.006

**GLP-1 RA: Glucagon-like peptide-1 receptor agonists* anesthesia practices for patients on GLP-1 RAs compared to those who are not; and to assess the impact on patient length of stay.

Methods

This retrospective cohort study was conducted at Mayo Clinic Health System Northwest Wisconsin Region from November 1, 2022, to October 31, 2023. The study included adult surgical patients 18 years or older requiring at least one night stay and at least 12 hours in the hospital post-operatively. Identification of patients prescribed injectable GLP-1 RAs was completed using the prior to admission (PTA) medication list documented within the electronic health record. Patients were excluded if they were pregnant or had a prescription for an oral GLP-1 RA or glucose-dependent insulinotropic polypeptide (GIP)/GLP-1 dual agonist. Information was collected from the electronic health record with assistance from an internal pharmacy informatics team. The study was approved by the appropriate Institutional Review Board (IRB), and the requirement for written informed consent was waived by the IRB.

Baseline information collected included age, ethnicity, race, sex as officially documented in medical record, weight at the time of surgery, presence of diabetes diagnosis, and prior to admission antiemetic use (Table 1). Surgical information collected included surgical service, surgical procedure, type of anesthesia ordered and administered, case request date and time, date and time of procedure, and hospital length of stay. Anesthesia types included general, regional, monitored anesthesia care, general with pain block, local, and moderate sedation. Data was collected through review of the surgical case request time and the actual surgery date to evaluate if the holding period implementation reduced PONV for patients on GLP-1 RAs. A determination was made if there were at least 7 days between the surgical request time and surgery date for patients on weekly injectable GLP-1 RAs or at least 24 hours if on a daily injectable. Antiemetics of interest collected included ondansetron, granisetron, palonosetron, prochlorperazine, haloperidol, fosaprepitant, aprepitant, promethazine, and metoclopramide for each group (Table 2). Pertinent order information, such as route of administration and order directions, was also collected. Administrations for the first 24 hours post-operatively were recorded for each antiemetic used during that period.

Data was summarized using frequencies and percentages for categorical data and either means and standard deviations or medians and interquartile ranges (IQR) for continuous data. Comparisons were made between groups using Chi-square or Fisher's exact tests for categorical data and either a t-test or Kruskal-Wallis test for continuous data. All analyses were performed using R version 4.1.2 (R Core Team, R Foundation for Statistical Computing, Vienna, Austria).

Results

In total, 105 patients were included in the GLP-1 RA group with 2674 patients included in the non GLP-1 RA group (Table 3). The GLP-1 RA group had a higher percent of procedures for patients with at least one antiemetic administered within 24 hours post-operatively (21.0% versus 18.9%).

Of the 105 total patients in the GLP-1 RA group, 62 patients had their procedure prior to the new ASA guideline and 43 patients after the ASA guideline. Prior to the ASA guideline implementation, 24% of patients in the GLP-1 RA group had at least one antiemetic administered postoperatively. After the ASA guideline implementation, 26% of patients had at least one antiemetic administered postoperatively. Upon further analysis, for the 11 patients who

TABLE 2. Antiemetic Administered Post-Operatively

Antiemetic	*GLP-1 RA (n=124)*	*No GLP-1 RA (n=3199)*
Ondansetron	23 (18.5%)	497 (15.5%)
Granisetron	3 (2.4%)	8 (0.3%)
Palonosetron	0	0
Prochlorperazine	4 (3.2%)	101 (3.2%)
Haloperidol	4 (3.2%)	85 (2.7%)
Fosaprepitant	0	1 (0.0%)
Aprepitant	0	0
Promethazine	3 (2.4%)	36 (1.1%)
Metoclopramide	1 (0.8%)	26 (0.8%)

**GLP-1 RA: Glucagon-like peptide-1 receptor agonists*

TABLE 3. Post-Operative Antiemetic Administrations

	GLP-1 RA	*No GLP-1 RA*	*p-value*
Patients with antiemetics administered	26/105 (24.8%)	579/2674 (21.7%)	0.52
Procedures with antiemetics administered	26/124 (21.0%)	605/3199 (18.9%)	0.65
Antiemetic order administrations (total)	56	977	--
Median (IQR) administrations per person	1 (1, 2)	1 (1, 2)	0.14
Procedures with pre-procedure antiemetic given	9/124 (7.3%)	191/3199 (6.0%)	

**GLP-1 RA: Glucagon-like peptide-1 receptor agonists*

TABLE 4. GLP-1 RA Holding Period

Appropriate Hold Period	*Yes (N=19)*	*No (N=24)*	*p-value*
Procedures with antiemetic administrations	8 (42%)	3 (13%)	0.038
Antiemetic administrations	28	5	--
Median (IQR) administrations per person	3.5 (1, 5.3)	2 (1.5, 2)	0.53
Median (IQR) administrations per person	1 (1, 2)	1 (1, 2)	0.14

**GLP-1 RA: Glucagon-like peptide-1 receptor agonists*
***Hold periods defined as procedures for patients on GLP-1 RAs with case request time and surgery date ≥ 7 days apart, or appropriate depending on the medication after July 1, 2023.*

underwent surgery after the ASA guideline implementation and received at least one antiemetic postoperatively, eight patients (73%) met the criteria for adequate holding period. Three patients did not meet the criteria of holding more than 7 days for patients on weekly injectable GLP-1 RAs. The most notable reason for not meeting the hold period criteria was that it was an emergent surgery. Of the 8 patients meeting the holding period criteria, their procedures had a median of 3.5 (IQR 1, 5.3) antiemetic administrations per procedure, and for the 3 patients who did not meet the holding period criteria, there was a median of 2 (IQR 1.5, 2) administrations (p=0.53) (Table 4).

For the third objective, to review differences in anesthesia used between the groups, 82.3% of the GLP-1 RA group utilized general anesthesia compared to 69.3% in the No GLP-1 RA group. Surgical service performing the procedure was similar between groups (Table 6). Overall, there was a statistically significant difference in the type of anesthesia used for patients on GLP-1 RAs (p<0.001).

For the fourth objective, patients in the GLP-1 RA group had an average length of stay of 4.4 days versus 5.3 days for the No GLP-1 RA group (p=0.024) (Table 5).

TABLE 5. Inpatient Surgical Encounter (n=3323)

		GLP-1 RA (N=124)	*No GLP-1 RA (N=3199)*	*p-value*
Average length of stay (days), mean ± SD		4.4 ± 3.1	5.3 ± 4.4	0.024
Anesthesia Type, n (%)	General	102 (82.3%)	2216 (69.3%)	<0.001
	Regional	1 (0.8%)	291 (9.1%)	
	Monitored Anesthesia Care	15 (12.1%)	587 (18.3%)	
	General with Pain Block	6 (4.8%)	101 (3.2%)	
	Local	0	1 (0.05%)	
	Moderate Sedation	0	2 (0.1%)	
	Unknown (not documented)	0	1 (0.05%)	

**GLP-1 RA: Glucagon-like peptide-1 receptor agonists*
Total inpatient surgical encounters from November 1, 2022 to October 31, 2023 in Northwest Wisconsin Region Mayo Clinic

Discussion

No significant difference in antiemetic use post-operatively was found between patients in the GLP-1 RA group and the No GLP-1 RA group. Pre-procedure antiemetic administration was similar between groups. Patients were not matched by procedure type, but surgery service performing the procedure was collected and there were no major discrepancies among groups. However, differences in baseline characteristics, such as weight, presence of diabetes, and PTA antiemetic use, should be considered, as these factors may influence PONV. Prior to admission GLP-1 RA use may not predispose patients to increased PONV.

Implementation of the ASA guidance for holding GLP-1 RAs before procedures did not produce a significant difference in antiemetic administrations. Holding GLP-1 RAs prior to procedures did not impact PONV but may be important for preventing other adverse effects. Prior studies and case reports have demonstrated that patients on GLP-1 RAs may vomit residual gastric contents despite adhering to pre-operative fasting guidelines, raising

concerns that this may elevate the risk of aspiration and other complications following surgery.

There was greater use of general anesthesia in the GLP-1 RA group; however, this was not matched by type of procedure. It is unclear whether the GLP-1 RA group procedures required a higher use of general anesthesia based on the nature of the procedure, or whether general anesthesia was used more often due to patient-specific factors.

The GLP-1 RA group had a shorter average length of stay than patients in the No GLP-1 RA group. Length of stay is influenced by many factors, including procedure type, complications and other patient specific factors. Based on our study, it does not appear that GLP-1 RA use preoperatively contributes to hospital length of stay.

Limitations of the Study

This study does carry some limitations. Among the patients included, only 11 underwent surgery after the ASA guideline implementation and received at least one antiemetic postoperatively, limiting the ability to draw conclusions. This is a retrospective study with a small sample size and relied on chart review. As a result of these limitations, findings should be considered exploratory and correlational, not used to identify causation. Patients may have contraindications to specific antiemetic treatments, which may have limited the use of certain agents in this study. Patients may have other medications for comorbid conditions that may have antiemetic properties, such as olanzapine for mental health, which further complicates interpretation of the relationship between GLP-1 RA use and antiemetic administration. This consideration also resulted in a narrowed list of antiemetics for inclusion. Additional agents, such as olanzapine and dexamethasone, were excluded for this reason. In addition, patients may be prescribed medications for comorbid conditions that may increase nausea and vomiting, such as oral chemotherapy. Patients also may be predisposed to nausea and vomiting due to comorbid conditions. Certain surgical services utilize pre-operative antiemetics, which may impact post-operative administrations. This study also measures PONV indirectly through antiemetic administrations, which assumes the relationship, rather than directly measuring PONV. Only patients with an injectable GLP-1 RA on their PTA medication lists were included in the search for patients. This may have omitted patients obtaining GLP-1 RAs who did not self-report the prescription. Lastly, gastric content measurements are not a routine part of practice at this site, limiting the ability to collect that information for comparison to previous studies or assess the potential relationship with PONV.

Conclusion

This study provides preliminary insights into the post-operative effects of GLP-1 RA use, though further research is needed to draw definitive conclusions. Patients on GLP-1 RAs utilize more antiemetics post-operatively; however, the difference was not statistically significant. The holding period guidance implementation did not impact post-operative antiemetic use. GLP-1 RA patients did not have a longer length of stay post-operatively compared to the No GLP-1 RA group. Lastly, more general anesthesia was used in the GLP-1 RA group. Further studies are warranted to explore the relationships among GLP-1 RAs, gastric content measurements, and post-operative nausea and vomiting. Additionally, investigating whether pretreatment with antiemetics may improve post-operative outcomes in this population could provide valuable insight. An evaluation of the risks versus benefits of holding GLP-1 RAs for patients with diabetes and the potential impact on blood glucose levels a week prior to surgery could be useful to determine if there may be harm associated with holding the medication.

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TABLE 6. Surgical Service in Charge by Glucagon-like Peptide 1 Receptor Agonist (GLP-1 RA) (n=124) Versus No GLP-1 RA (n=3199) Group

	GLP-1 RA group %, (n)	No GLP-1 RA group %, (n)
Anesthesiology	0	4
Cardiovascular Disease	2.4 (3)	2.3 (72)
Cardiovascular Surgery	18.5 (23)	13 (416)
Electrophysiology	2.4 (3)	1.2 (39)
Family Medicine	0	0.1 (3)
Gastroenterology	9.7 (12)	14.3 (459)
General	26.6 (33)	17.7 (567)
Gynecologic	0	0.1 (3)
Interventional Radiology	0	0.1 (4)
Neurologic	7.3 (9)	7.8 (249)
Obstetrics/ Gynecology	0	7.1 (227)
Ophthalmic	0	0.1 (2)
Oral	0	0.3 (9)
Orthopedics	12.1 (15)	20 (639)
Orthopedics/Trauma	0	0.1 (2)
Orthopedics/ Podiatry	5.6 (7)	2.3 (72)
Head and neck	1.6 (2)	0.7 (22)
Plastic	0.8 (1)	0.2 (6)
Pulmonary	0	0.9 (29)
Trauma	0	0.03 (1)
Urology	4 (5)	4.7 (150)
Vascular	8.9 (11)	7 (224)

**GLP-1 RA: Glucagon-like peptide-1 receptor agonists*

PR
This article has been peer-reviewed. The contribution in reviewing is greatly appreciated!

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A Cost Savings Quality Improvement Assessment of Rasburicase Dosing for Tumor Lysis Syndrome

by Mark T. Moua, PharmD, Emily Roland, PharmD, BCPS, Connie Folz, PharmD, BCPS, Sara Griesbach, PharmD, BCPS, BCACP

Abstract

Background: Rasburicase is an effective but expensive medication for the treatment of tumor lysis syndrome. With most recent guidelines published in 2008, guidance for rasburicase use is dated. This quality improvement project assesses the current prescribing practices for rasburicase and advocates for cost-effective care through standardizing dosing based on the current literature. Pharmacists can help ensure the proper indication, dosing, and administration of this medication, especially considering the associated cost of the drug.

Methods: This retrospective, multi-centered quality improvement project included a medication use assessment of rasburicase prescribed for adult patients between January 1, 2022, and July 31, 2023. Data extraction included patient age, malignancy diagnosis, uric acid level prior to rasburicase administration, dose of rasburicase prescribed, prescriber specialty and name, and uric acid level post-administration.

Results: Over the study period, rasburicase was ordered 79 times for a variety of malignancies. There were 31 incidents where rasburicase was ordered by a physician outside hematology-oncology. Sixty-one of the 79 orders were dosed for 6 mg; however, 56 orders could have been optimized based on the uric acid level prior to rasburicase administration.

Conclusion: By standardizing rasburicase dosing, the institution could have utilized significantly less rasburicase within the studied period, resulting in an estimated annual cost savings of $50,000. Through implementation of dosing recommendations within an electronic medical record, pharmacists can help to ensure proper dosing and promote cost-considerate care.

Key Words: rasburicase, tumor lysis syndrome, dosing, fixed dose regimen, cost savings

Tumor lysis syndrome (TLS) refers to metabolic disturbances that most often occur after induction of chemotherapy.[1] This is observed more commonly in patients with hematologic malignancies, such as Burkitt's lymphoma or acute lymphoblastic leukemia (ALL), but can occur spontaneously for tumors with a high proliferation rate, large tumor burden, or chemo-sensitive malignancies.[2] TLS is a serious and common oncologic emergency for both pediatric and adult patients. Incidence of TLS in patients with hematologic malignancies ranges from 10% to 30% depending on the type of cancer and the aggressiveness of the disease. Incidence in solid tumors is less than 5%.[3] Due to the serious mortality and morbidity associated with TLS, prevention is critical. This can include screening for predisposing risk factors such as pre-existing kidney disease, volume depletion, and high uric acid levels prior to treatment.

Tumor lysis syndrome occurs most often after chemotherapy when large numbers of neoplastic cells are killed rapidly.[3] This causes the rapid release of intracellular contents into systemic circulation, leading to the quick development of hyperkalemia, hyperphosphatemia, hyperuricemia, and hypocalcemia. Some clinical consequences of TLS are acute kidney injury, cardiac arrhythmias, and even death.

Management of TLS can include implementation of appropriate prophylactic measures such as aggressive hydration, vigilant monitoring of electrolytes, and initiating treatment when appropriate. Agents to alleviate hyperuricemia, including allopurinol, rasburicase, and febuxostat, are used most commonly. Allopurinol is a competitive inhibitor of xanthine oxidase, blocking the conversion of purine metabolites to uric acid and inhibits the formation of new uric acid.[4,5] While generally initiated prior to chemotherapy initiation, allopurinol does not reduce existing uric acid within the blood, which can take several days for elevated levels to normalize.

When a patient's uric acid level is not adequately controlled with aggressive IV hydration and allopurinol, rasburicase (Elitek®) is an optional treatment with demonstrated efficacy. Rasburicase is a recombinant urate oxidase enzyme that converts pre-existing uric acid to allantoin, a highly soluble metabolite that is excreted by the kidneys.[3,6] A barrier to its use is the high medication price. Additionally, while rasburicase is approved by the Food and Drug Administration for the treatment of TLS, the use of prophylactic rasburicase in patients at intermediate and high risk for TLS remains controversial.[3]

In 2008, the American Society of Clinical Oncology published the most recent guidelines for TLS.[3] In these guidelines, recommendations included dosing rasburicase based on weight (0.2 mg/kg intravenously once daily). However, since the guidelines were published, there is more literature supporting single-dose regimens of rasburicase. Even with this guidance, ideal dosing for rasburicase is undefined. Clear guidance is necessary for cost-effective treatment in a disease with serious mortality and morbidity.

In 2023, the expert consensus for tumor lysis syndrome published a recommendation for a capped 3 mg single dose for rasburicase to promote cost-efficient care.[7] Multiple studies have shown that when the uric acid is greater than 8 mg/dL, a 3 mg dose is sufficient; however, when the uric acid is greater than 12 mg/dL, a 6 mg maximum dose should be considered.[2,8]

Use of fixed dosing for rasburicase offers benefits in terms of simplicity, consistency, safety, and cost-effectiveness. The objective of this study was to standardize fixed dosing of rasburicase and assess the potential cost savings.

TABLE 1. Rasburicase Dosing Criteria

Timeline	*Pre-August 2023*	*Post-August 2023*
Prescriber Specialty	***Hematology/Oncology***	***Hematology/Oncology***
Criteria	For use in Hematology/Oncology adult and pediatric patients in the inpatient setting meeting at least one of the following criteria: 1. Current hyperuricemia (uric acid ≥ 8 mg/dL) from lab value drawn within 24 hours of first dose 2. High risk patients [Burkitt's lymphoma, WBC ≥ 100,000 in Acute lymphocytic leukemia (ALL), WBC ≥ 50,000 in Acute myeloid leukemia (AML)] PLUS one of the following criteria: • Bulky disease (> 10 cm) or elevated LDH (> 2x ULN) • SCr > 1.5x ULN • Documented allergy to allopurinol	For use in Hematology/Oncology adult and pediatric patients in the inpatient setting meeting at least one of the following criteria: 1. Current hyperuricemia (uric acid greater than or equal to 8 mg/dL) from lab value drawn within 24 hours of first dose **after chemotherapy** 2. High risk patients [Burkitt's lymphoma, WBC ≥ 100,000 in Acute lymphocytic leukemia (ALL), WBC ≥ 50,000 in Acute myeloid leukemia (AML)] PLUS one of the following criteria: • Bulky disease (> 10 cm) • Elevated LDH (> 2x ULN) • SCr greater than **1.25 X ULN** • Documented allergy to allopurinol **(can consider using febuxostat instead)**
Rasburicase dosing	1. Rasburicase 0.2 mg/kg IV to **max dose of 6 mg** 2. Weight based doses < 6 mg will be rounded to nearest vial size except when: • rounded dose exceeds a percentage difference of 5% • calculated dose is < 1.5 mg 3. Only a one-time dose will be ordered 4. Subsequent doses will not be prescribed until a repeat uric acid level demonstrates: • Uric acid > 8 mg/dL • Upward trend from baseline 5. Dosing beyond 5 days or repeat courses is not recommended 6. Recommended that planned chemo is initiated 4-24 hours from administration	1. Uric acid of 8 – 11.9 mg/dL – recommend **rasburicase 3 mg fixed-dose** 2. Uric acid greater than or equal to 12 mg/dL – recommend **rasburicase 3 – 6 mg fixed-dose** 3. Maximum dose of 6 mg 4. Only a one-time dose will be ordered 5. Subsequent doses will not be prescribed until a repeat uric acid level demonstrates: • Uric acid is greater than or equal to 8 mg/dL • Upward trend from baseline

WBC=white blood count, mg/dL=milligrams per deciliter, LDH= lactate dehydrogenase, SCr=serum creatinine, ULN=upper limit of normal, IV=intravenous

Bold text*=changes between pre and post institution dosing guideline updates*

Methods

We conducted a retrospective, multi-center quality improvement project, collecting data via electronic health records from January 1, 2022, to July 31, 2023. The study was deemed to not be human subject research and did not require approval by the Institutional Review Board.

Patients were included if they were 18 years of age or older, prescribed rasburicase by a health system provider, and admitted to the hospital. Patients were excluded if they were younger than 18 years of age. Data extraction included patient age, malignancy diagnosis, uric acid level prior to rasburicase administration, dose of rasburicase prescribed, prescriber specialty and name, and uric acid level after rasburicase administration. Information was collected through a manual chart review and extraction of data from the electronic health record.

When rasburicase was ordered, it was assessed against current policy. The current policy for rasburicase prescribing was based on the period as shown in Table 1.

Based on literature demonstrating consistency in efficacy, rasburicase dosing criteria was updated to include fixed dosing. After approval from the System Pharmacy and Therapeutics committee, additional alerts were implemented in the electronic health record. When rasburicase was ordered, a medication alert would appear during the pharmacist verification step. This alert would contain the current rasburicase criteria for use with updated dosing recommendations. If the uric acid level was 8 – 11.9 mg/dL, rasburicase 3 mg fixed-dose was recommended. If the uric acid level was greater than 12 mg/dL, a 6 mg fixed dose was recommended.

Results

Between January 1, 2022, and July 31, 2023, there were a total of 79 orders for rasburicase. Patients were diagnosed with a variety of malignancies, including leukemia, lymphomas, lung cancer, multiple myeloma, myelodysplastic syndrome, or colon cancer.

Of the doses ordered, 61 were dosed at 6 mg (77%), 14 were dosed at 3 mg (18%), one order was dosed at 4.5 mg (1%), and three orders were dosed at 7.5 mg (4%). In three incidents (4%), no uric acid labs were ordered prior to ordering rasburicase. Comparing the dose ordered to the new criteria approved in August 2023, dosing could have been optimized in 32 incidences (41%). Of the 6 mg doses, only 23 incidences matched our proposed dosing scheme (38%), with the uric acid levels greater than or equal to 12 mg/dL. Of the 3 mg doses ordered, nine incidences (64%) matched our proposed dosing scheme, with the uric acid greater than or equal to 8 mg/dL.

There were 31 incidents where rasburicase was ordered by a physician outside of the hematology-oncology specialty. Seventeen of these orders were from hospitalists, one was ordered by nephrology, nine were ordered by internal medicine, two were ordered by critical care medicine, and two were ordered by pulmonary medicine.

Discussion

In assessing rasburicase use for TLS in our health system, our study found 6 mg doses were ordered more than 3 mg, even when the uric acid was less than 8 mg/dL. Standardization of the rasburicase dose would benefit our health institution by decreasing the discrepancies among providers at the point of order entry, especially when literature and outdated guidelines provide unclear guidance. Additionally, through the study period, standardization of rasburicase dosing based on uric acid level would have prevented 164 mg of rasburicase use, saving approximately $50,000 a year.

Rasburicase was often ordered by the provider team managing the patient (e.g., hospitalist). The hematology/oncology specialty prescribing requirement was removed based on the medication being prescribed by non-oncology providers.

One interesting incidental finding we discovered was that the ordered uric acid levels after rasburicase administration may not be recorded correctly. Because rasburicase is an enzyme it will continue to degrade the uric acid within the collected specimen. This may lead to, falsely, low uric acid levels, which is important because accurate uric acid measurements are crucial in guiding treatment decisions. Guidance exists advocating the utilization of chilled test tubes for sample collection and immediate placement of samples in an ice bath to avoid this pitfall. Additionally, samples should be assayed within 4 hours of collection.[9] Directions to ensure samples are properly obtained and assayed have been added to the order set.

Pharmacists can play a crucial role in the management of rasburicase therapy, particularly in the use of fixed dosing for TLS. Their involvement can optimize patient outcomes, improve safety, and ensure cost-effective treatment by providing evidence-based recommendations, supporting clinical decision-making, optimizing drug utilization, developing and updating protocols, implementing decision support tools, and proactively monitoring laboratory values.

A number of studies have investigated fixed doses of 3 mg or 6 mg of rasburicase, showing these doses are effective in lowering uric acid levels in patients with high tumor burden or at risk of TLS, even without adjusting the body weight or renal function. One study concluded that 3 mg of rasburicase is effective in reducing uric acid in patients with moderate TLS risk, even in patients with renal impairment.[4] They reported similar outcomes to weight-based dosing in terms of uric acid reduction and prevention of kidney injury.

Another study demonstrated that fixed doses of rasburicase are efficacious in achieving rapid uric acid reduction in patients with hematologic malignancies, showing no significant difference in the time to achieve target uric acid levels compared to weight-based doses.[8] Fixed doses also resulted in fewer medication errors and more efficient resource utilization. Authors concluded that indication-based, low-dose rasburicase was more effective and more cost-efficient compared to the traditional weight-based dosing approach. Specifically, the average monthly cost of rasburicase decreased by 59.9% after adopting the new protocol, suggesting the fixed-dose regimens can achieve desired clinical outcomes while reducing healthcare expenses associated with TLS management.

Conclusion

By standardizing rasburicase dosing, the institution could have utilized significantly less rasburicase within our studied period, resulting in an estimated annual cost savings of $50,000. Through implementation of dosing recommendations within an electronic medical record at the point of verification, pharmacists can ensure proper dosing and promote cost-considerate care. Fixed doses of 3 mg or 6 mg can provide comparable outcomes to weight-based dosing with the added benefit of reducing drug costs and simplifying administration protocols.

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Preceptor Preferences: Optimizing Pharmacy Experiential Education Site Visits

by Lisa S. Kipper, PharmD, Lisa M. Richter, PharmD, BCPS, BCCCP, FASHP, Amanda R. Margolis, PharmD, MS, BCACP, Laurie W. Fleming, PharmD, FASHP

Abstract

Primary Objective: This study aims to explore current and preferred practices regarding experiential education site visits among pharmacy preceptors with a focus on optimizing visit duration and format.

Methods: Preceptors from three pharmacy programs were surveyed about their experiences and preferences regarding site visits. Key metrics assessed included visit duration, frequency, format, content, and the roles of individuals conducting the visits.

Results: The findings revealed that most preceptors preferred site visits lasting 30 to 60 minutes and desired them to occur every two years. In-person visits were favored, though there was a notable openness to phone visits, with virtual visits less preferred. Key discussion topics identified included rotation syllabi and student feedback, with a need for streamlined interactions.

Conclusion: The study highlights the necessity for pharmacy programs to adapt their site visit practices to better support preceptors. Shortening visit durations and incorporating alternative formats, such as phone visits, may be preferred by preceptors. Moreover, schools should prioritize discussing relevant materials and feedback during visits to enhance their effectiveness. Future research should focus on strategies for showing appreciation to preceptors to foster a positive educational environment.

Key Words: experiential education, experiential learning, site visits, quality assurance, preceptors

The Accreditation Council for Pharmacy Education (ACPE) mandates that schools of pharmacy have policies in place regarding practice sites for Introductory Pharmacy Practice Experiences (IPPE) and Advanced Pharmacy Practice Experiences (APPE) students.[1] However, ACPE does not provide specific guidance for the Offices of Experiential Education or preceptors on conducting site visits.[2,3] This lack of guidance can result in inconsistent practices and missed opportunities for quality assurance and enhancement.[4] By determining preceptor needs for site visits, schools can ensure that both the experiential education teams and preceptors are better equipped to provide students with meaningful and effective learning experiences.

Effective site visits play a vital role in ensuring the quality and consistency of experiential education.[3-5] Offices of Experiential Education (OEE) need clearer guidelines on the frequency and objectives of these visits, whether conducted virtually or in person.[3] Currently, during site visits, key elements such as preceptor needs, student performance, and the overall quality of the practice site are often assessed.[3,4] However, with standardized guidance, OEE can further enhance the effectiveness of these visits. By having a cohesive and efficient process in place, experiential education teams can improve workflow, optimize site visits, and ensure that students receive the best possible experiential education and support.[6]

Consistent site visits would allow for more cohesive and effective experiential education programs, ensuring that students receive comparable and high-quality training regardless of their institution. This consistency can lead to improved student performance and satisfaction, as well as a stronger alignment between educational objectives and real-world pharmacy practice.[6] The purpose of this evaluation was to explore preceptor preferences and subsequently the optimization of experiential education site visits for both school administrators and preceptors.

Methods

Education Settings

The University of Mississippi, the Marshall B. Ketchum University College of Pharmacy, and the North Dakota State University School of Pharmacy experiential programs surveyed their preceptors regarding site visits (Table 1). The programs vary in the type of institution, APPE structure, number of faculty, number of students, number of preceptors, and number of sites. The main goals of site visits for all three schools were preceptor outreach, new preceptor training, and preceptor development. Other items consistently discussed during site visits included overview of the evaluation process, importance of frequent feedback, opportunities for interprofessional interactions, site resources and facilities, patient population, and adequacy of staff support.

Survey Development

Survey questions were developed based

on literature and OEE faculty reflections of site visit activities. Site visit evaluation forms from participating schools were also utilized. The survey was piloted by three pharmacist preceptors (one from each pharmacy program). The survey was edited for content and clarity following the pilot testers' feedback.

Description of Survey

The electronic survey consisted of 16 multiple-choice, matrix table, and text entry questions. Skip logic was utilized for participants to bypass questions that did not pertain to them or their site. Participants were asked about the types of site visits they had participated in, the frequency and length of those visits, and items discussed during the visits. They were also asked about their preferences for types of site visits, frequency and length, and what would be helpful to discuss. Demographic information was also collected.

Preceptors and Survey Administration

Participants were pharmacy preceptors from one of the three schools/colleges who had completed a student evaluation in the previous 12 months. Participants were invited to participate in an anonymous Qualtrics® survey via email and reviewed a consent form prior to starting the survey. The survey was open April 17, 2024, to April 30, 2024, and 833 preceptors were invited to participate. A reminder email was sent one week after the initial invitation to participate and on the final day.

Analysis

Descriptive statistics such as proportions, means, and standard deviations were calculated. For open response questions with numbers, if preceptors shared a range, the median was used. The descriptions reported by preceptors of their site visits were compared to their preferred site visit structure using the Fisher's exact test. A p-value of <0.05 was used to indicate statistical significance and there were no adjustments for repeated measures. All analyses were performed using Stata/SE™ version 17.0. This evaluation was determined to be exempt by The University of Mississippi IRB.

Results

Of the 155 preceptors who started the survey (18.6% response rate), there were 64 usable survey responses (38.6%). Of the unusable survey responses, 67 had not participated in a site visit (43.2%), 6 did not consent to participate (3.9%), and 18 consented to the study, but did not answer any survey questions (11.6%). Among the 64 preceptors who completed the survey, the majority were site primary preceptors (Table

TABLE 1. Institution and Experiential Program Descriptions

Institution	The University of Mississippi	Marshall B. Ketchum University College of Pharmacy	North Dakota State University School of Pharmacy
Type of Institution	Public	Private, Non-profit	Public
Faculty in OEE	1	2	3 (1.9 FTE)
Staff in OEE	2	2	2
Years in Professional Program	4	4	4
APPE Structure	4 weeks	6 weeks	5 weeks
Total # in 2024-2025 APPE Class	51-100	0-50	51-100
Total # Preceptors	401-500	101-200	>500
Total # of Sites	201-300	101-200	>300
Method of Site Visits	Virtual and In-person	In-person	Virtual and In-person
Person Completing Site Visits	Director of Experiential Education	Director of Experiential Education	Director of Experiential Education
Frequency of Site Visits	Every 4 years and when needs arise	Yearly	Every 2-3 years and when needs arise
Distance of furthest site	>500 miles	51-100 miles	>500 miles
Distance of furthest site for in-person visit	201-300	51-100	301-500

OEE = Offices of Experiential Education, APPE = Advanced Pharmacy Practice Experiences, FTE = full time equivalent

TABLE 2. Preceptor Demographics (n=45)

Characteristic	***n (%)***
Role Related to Precepting	
Primary preceptor	39 (86.7)
Site coordinator	11 (24.4)
Director of pharmacy	14 (31.1)
Precepting Duration	
0-3 years	8 (17.8)
4-6 years	12 (26.7)
7-10 years	8 (17.8)
More than 10 years	17 (37.8)
Rotation Type[a]	
Acute care	10 (22.2)
Ambulatory care	5 (11.1)
Community	16 (35.6)
Elective	16 (35.6)
Health-system	11 (24.4)
Number of Students in Last 3 Years[b]	***Mean (sd)***
APPE	11.7 (12.0)
IPPE	7.1 (9.6)

sd = standard deviation
[a]Preceptors could choose more than 1 rotation type
[b]n=43 and if preceptor gave a range, the median was use

2). The most frequent precepting duration was more than 10 years and most frequent rotation types were community and elective. Over the last 3 years, preceptors reported a mean of 11.7 APPE and 7.1 IPPE students.

The majority of preceptors described site visits taking 30 (48.4%) or 60 minutes (40.6%), which was consistent with preceptor preferences (49.1% and 44.1%, respectively) (Table 3). While the majority of site visits were conducted by a director of OEE, the preceptors were open to other OEE faculty and staff conducting site visits. Only 11.7% of preceptors reported their site visits were conducted by OEE faculty but 31.6% would find any OEE faculty conducting site visits to be acceptable (absolute difference 19.9%, p=0.007). Similar results were seen for OEE staff where 6.7% of preceptors reported OEE staff conducting a site visit whereas 26.3% were open to it (absolute difference; 19.6%; p=0.001). The primary preceptor most frequently attended the site visit followed by the pharmacy director/supervisor. Lastly, the majority of site visits were reported as in person every 3-4 or 5 or more years. However, preceptors reported preferring every other or every 3-4 years and were open to phone and virtual modalities for site visits.

When describing what kind of site visit they participated in, 39 (60.9%) preceptors described a new site visit, 43 (67.2%) described an existing site visit, and 3 (4.7%) described a focused site visit (preceptors could select more than one type of site visit). When asked to describe what was discussed, 32 (82.1%) of those preceptors completed questions for new site visits, 30 (69.8%) for existing site visits, and 25 (58.1%) described existing site visit preferences (Table 4). During new site visits, the highest frequency of items discussed were the ability to serve as a preceptor (81.2%), resources for student learning (62.5%), updates on the pharmacy program (62.5%), pharmacy program expectations (59.4%), and orientation to the pharmacy program (56.2%). During existing visits, the highest frequency of items discussed were updates on the pharmacy program (76.7%), review of student feedback (70.0%), resources for student learning (66.7%), preceptor feedback on student preparedness (60.0%), and adequate space for students (60.0%).

For existing site visits, when what

TABLE 3. Site Visit Descriptions Compared to Preceptor Preferences

	Actual; n (%)	*Preference; n (%)*
Length	***n=64***	***n=59[a,d]***
30 minutes	31 (48.4)	29 (49.1)
60 minutes	26 (40.6)	26 (44.1)
90 minutes	3 (4.7)	1 (1.7)
120 minutes	4 (6.3)	4 (6.8)
Who Conducted Visit	***n=60***	***n=57[d]***
Director of EE	41 (68.3)	34 (59.7)
Assistant/associated director of EE	8 (13.3)	11 (19.3)
Any EE faculty member	7 (11.7)	18 (31.6)[b]
Any EE staff member	4 (6.7)	15 (26.3)[b]
Unknown title(s)	7 (11.7)	2 (3.5)
Preceptors Present	***n=60***	***N/A***
Primary preceptor(s) only	45 (75)	
All preceptors	11 (18.3)	
Pharmacy director/supervisor	25 (41.7)	
Pharmacy residents	7 (11.7)	
Other	3 (5.0)	
Visit frequency	***n=47***	***n=47[a,c]***
In person		
Annually	7 (14.9)	8 (17.0)
Every other year	5 (10.6)	14 (29.8)
Every 3-4 years	13 (27.7)	12 (25.5)
5 or more years	17 (36.2)	8 (17.0)
Never/prefer none	N/A	4 (8.5)
No answer	5 (10.6)	2 (4.3)
Phone		
Annually	8 (17.0)	9 (19.2)
Every other year	3 (6.4)	12 (25.5)
Every 3-4 years	4 (8.5)	4 (8.5)
5 or more years	13 (27.7)	3 (6.4)
Never/prefer none	N/A	9 (19.2)
No answer	19 (40.4)	11 (23.4)
Virtual		
Annually	3 (6.4)	10 (21.3)
Every other year	2 (4.3)	9 (19.2)
Every 3-4 years	6 (12.8)	5 (10.6)
5 or more years	13 (27.7)	2 (4.3)
Never/prefer none	N/A	13 (27.7)
No answer	23 (48.9)	8 (17.0)
Visit frequency	***n=47***	***n=47[a,c]***
EE manual		32 (68.1)
Contact information for EE Team		31 (66.0)
Rotation syllabus		38 (80.9)
CE opportunities		33 (70.2)
Recruitment materials		17 (36.2)

EE = experiential education; N/A = not applicable or not asked; CE = continuing education
[a] 1 preceptor selected more than 1 time
[b] p-value <0.05
[c] 4 preceptors selected "never/prefer none" for all preferred site visit mode
[d] fewer preceptors responded to preference versus actual

occurred was compared to what preceptors preferred, discussion of adequate space for students occurred more frequently than preceptors preferred (60% actual versus 24% preferred; absolute difference 36%; p=0.01; Table 4). This was also true for resources for student learning (66.7% actual versus 36.0% preferred; absolute difference 30.7%; p=0.03). Other topics that occurred more frequently than preceptors preferred were orientation to the pharmacy program, experiential education policies, and preceptor development opportunities. Topics that preceptors preferred discussing more frequently included teaching quality at the site, preceptor feedback on student preparedness, and student evaluation rubrics.

TABLE 4. New Site Visit and Existing Site Visit Topics Discussed Compared to Preceptor Preferences

Item Discussed	*New Visit; n=32; n (%)*	*Existing Visit Actual; n=30; n (%)*	*Existing Visit Preference; n=25; n (%)*
Ability to serve as a preceptor, preceptor qualifications, and/or development	26 (81.2)	N/A	N/A
Adequate space for students	17 (53.1)	18 (60.0)	6 (24.0)
Resources for student learning	20 (62.5)	20 (66.7)	9 (36.0)
Orientation to pharmacy program	18 (56.2)	17 (56.7)	7 (28.0)
Pharmacy program expectations	19 (59.4)	N/A	N/A
Experiential education policies	N/A	16 (53.3)	11 (44.0)
Teaching quality at site	14 (43.8)	16 (53.3)	18 (72.0)
Student feedback process	15 (46.9)	N/A	N/A
Review of student feedback	N/A	31 (70.0)	19 (76.0)
Interprofessional opportunities	14 (43.8)	14 (46.7)	11 (44.0)
Student evaluation rubrics	14 (43.8)	15 (50.0)	16 (64.0)
Preceptor development opportunities/ resources	15 (46.9)	19 (63.3)	14 (56.0)
CPD opportunities/resources	11 (34.4)	15 (50.0)	14 (56.0)
Outreach from the pharmacy program	11 (34.4)	12 (40.0)	9 (36.0)
Updates on the pharmacy program	20 (62.5)	23 (76.7)	19 (76.0)
Preceptor feedback on student preparedness	N/A	18 (60.0)	19 (76.0)

N/A = not applicable or not asked; CPD = continuing professional development

Discussion

Preceptors from three different pharmacy programs in the U.S. reported current and preferred practices with experiential education site visits. Site visits were most frequently reported as 30 minutes in duration, with 60 minutes the next most frequent, which was consistent with preceptor preference. Given that a study of pharmacy preceptors in Northern California indicated that over half had scores indicating burnout in at least one of three burnout categories, shorter site visits may help decrease the time commitment of administrative and non-clinical preceptor duties.[7] Pharmacy programs should aim to keep site visits brief, as less than 9% of participants desired a visit 90 minutes or longer.

Preceptors most frequently indicated the Director of Experiential Education completed their site visit, which was also whom they most frequently preferred. Preceptors also appeared to be open to any experiential education faculty or staff member conducting the visit. Preceptors may be unaware of titles and differences between faculty and staff members, so individuals conducting the site visit should properly introduce themselves and explain their role at the school. As resources become even more scarce, pharmacy programs may consider including more staff and non-director faculty in site visits. This may allow directors more time to oversee other critical aspects of the experiential education program, especially as new standards are enacted which may require substantial changes to experiential programs.[8]

Currently, most site visits are done in-person every five or more years, but preceptors preferred a site visit every 2-4 years. Depending on the distance to the site, a more frequent site visit frequency may be difficult for some programs based on travel and human resources. Phone visits may offer an acceptable alternative. Phone and virtual site visit use was reported as occurring less frequently than in person. Phone visits were most commonly reported as occurring every 5 or more years; however, preceptors would prefer them every 2 years. Virtual visits were most commonly reported every 5 or more years, and preceptors indicated preferences for a virtual visit every 1-2 years. However, 28% preferred no virtual site visits despite potential advantages a virtual visit may have over an in-person visit. Soucie and colleagues described more flexibility and efficiency in virtual visits as well as decreased travel costs, which would also apply to phone visits.[8] Several drawbacks of virtual and phone visits include difficulty touring the site; difficulty in determining culture and interpersonal relationships at the site; and distractions at the site.[8] Interestingly, preceptors appeared to be more receptive to phone visits than virtual visits. Virtual site visits may be undesirable due to not wanting to be on a camera or lack of cameras available for the computer stations at the site.

On site visits, the most frequently discussed items appropriately reflected new site onboarding to ensure preceptors are familiar with the pharmacy program expectations. On existing site visits, a wide variety of topics were discussed. Preceptors most commonly preferred to review their teaching quality or how they could improve and were less interested in ensuring space for students or resources for student learning. Meaning, once those items were established, typically during the initial site visit, pharmacy programs may no longer need to discuss those items on site visits. Pharmacy programs can use this information to revise their site visit checklists for both initial and existing site visits to ensure appropriate items are reviewed at initial and existing site visits, and also to streamline the discussion and further minimize preceptor administrative burden.

Strengths of this evaluation include diverse preceptor input regarding duration of precepting, rotation type, and preceptor role from three different schools of pharmacy. The schools were from different geographic areas of the United States and different program types (i.e., public and private). Limitations include a small sample size following a low response rate. Additionally, many initial respondents had not yet participated in a site visit. New site visit preceptors were not asked their preferences regarding discussion topics, and this may have provided a different perspective from existing sites and/or more experienced preceptors. More targeted recruitment could be used in future evaluations to include individuals who were confirmed to have participated in a site visit.

Future directions include incorporation of the preceptor suggestions into site visit policies. Evaluation of impact on preceptor satisfaction following changes to site visit modality, frequency, and discussion items would be warranted as pharmacy preceptor burnout have been identified including a feeling of lack of appreciation.[7] Further evaluations could also investigate how preceptors are currently shown appreciation by the pharmacy program and how they would like to be shown appreciation on site visits.

Conclusions

In conclusion, this evaluation emphasizes the need for taking into account preceptor preferences for OEE site visits in pharmacy programs. The findings indicate a clear preference among preceptors for shorter site visits, ideally around 30 to 60 minutes, which can alleviate the burden of administrative duties while still ensuring meaningful interactions. The preference for site visits conducted by the director of experiential education suggests the importance of leadership visibility, yet the openness to including other faculty or staff members offers an opportunity for more efficient resource allocation.

While in-person visits remain the most favored method, the desire for more frequent interactions—every 2 years, as opposed to the more common 5 or more—highlights the need for flexibility in how these visits are conducted. The mixed feelings toward virtual visits point to the challenges posed by technology, emphasizing the importance of aligning visit formats with preceptor preferences and site capabilities.

The study highlights essential topics for discussion during visits, including rotation syllabi, preceptor qualifications, and development for new sites, as well as student feedback for current sites. These insights can help schools improve the relevance of these interactions. Despite limitations such as sample size and low response rates, the diverse input from preceptors across various programs offers valuable insights.

Future research should delve deeper into the impact of incorporating preceptor preferences into site visit policies and how preceptors feel appreciated and how those sentiments can be integrated into site visits. As pharmacy education continues to evolve, adapting experiential education practices to meet preceptors' needs will be essential for fostering a supportive and effective learning environment.

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2025 PSW Legislative Day Recap

2025 PSW Legislative Day Recap

by Abby Opsal, 2025 PharmD Candidate

The 2025 PSW Legislative Day gathered more than 400 pharmacists, pharmacy technicians, and student pharmacists from across the state of Wisconsin to advocate for the advancement and protection of pharmacy practice.

The day opened with a greeting from current PSW President Ryan Miller, who addressed the attendees and thanked them for their participation in advocating for the profession and supporting PSW. He went on to present the PSW Student Good Government Award to three student pharmacists who have exemplified what it means to be an advocate for the profession. This year, the award's recipients were Dylan Erdelt (UW-Madison), Angela Hayner (Concordia University Wisconsin), and Hannah Bush (Medical College of Wisconsin). The PSW Good Government Award was then presented to Thad Schumacher, the owner of Fitchburg Family Pharmacy, for his recent efforts in running for State Assembly and consistently working to build relationships with legislators to advocate for pharmacy and for patients.

Following the opening statements and awards, the day continued with Danielle Womack, PSW Vice President of Public Policy and Advocacy, leading a panel that included Senator Dora Drake, Senator Patrick Testin, Representative Clint Moses, and Representative Lisa Subeck. The panel discussed a variety of issues affecting healthcare, including pharmacy closures, workforce shortages, PBM reform, and improving access to care for underserved populations. They also shared background information about policymaking and misconceptions about speaking to legislators and reminded the audience that in Wisconsin, most healthcare-related issues have bipartisan support, and everyone in the Legislature is trying to do what they feel is best for their constituents.

After the legislative panel, Pharmacy Examining Board Chairman John Weitekamp and Vice Chair Tiffany O'Hagan shared updates about the Pharmacy Examining Board's recent activities. They shared updates on the results of the new pilot program that allows student pharmacists to sit for the Multistate Pharmacy Jurisprudence Examination (MPJE) after completion of their didactic curriculum instead of requiring graduation from pharmacy school. Members were encouraged to stay up to date with news and changes by subscribing to email updates on the DSPS website.

The day concluded with a legislative advocacy panel consisting of PSW Contract Lobbyist Forbes McIntosh, NACDS Director of State Government Affairs Ben Pearlman, Wisconsin Medical Society Chief Policy & Advocacy Officer Mark Grapentine, and pharmacist advocate Thad Schumacher, as well as updates on both federal and state policy from Womack. Four pieces of legislation were prioritized in preparation for the legislator office visits. The first bill is a PBM reform package that focused on increased transparency from PBMs and removing restrictions on patient

choice for their pharmacy. The second bill allows pharmacists to independently prescribe oral and patch contraception for patients over the age of 18 years. The third bill was one that PSW is in opposition to, as it requires pharmacists to dispense nearly all prescriptions that they receive, even if there are reasons for concern. The fourth bill removes the requirement to take the MPJE for licensure if a pharmacist has graduated from a Wisconsin-based pharmacy school. After the overview of the bills, attendees split into groups and walked to the Wisconsin State Capitol, where they met with their local legislators to discuss the bills.

The 2025 Legislative Day was another successful day of pharmacy advocacy. It was an opportunity to remind members of the importance of advocating for the profession and the impact that they can have by sharing their stories. PSW encourages you to continue the advocacy work beyond Legislative Day and offers several opportunities for you to get involved.

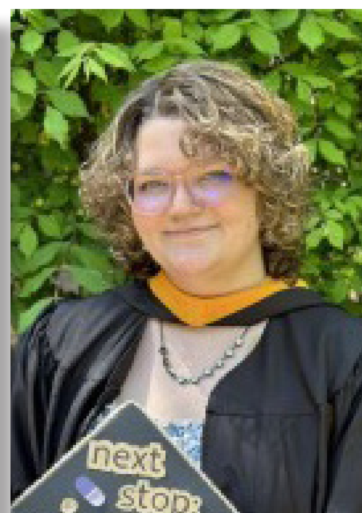
Abby Opsal is a 2025 Doctor of Pharmacy Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI.

Pharmacy Society of Wisconsin

2025 PSW Legislative Day Awards

GOOD GOVERNMENT AWARD
Thad Schumacher
Fitchburg Family Pharmacy

STUDENT GOOD GOVERNMENT AWARD
Dylan Erdelt
University of Wisconsin-Madison



STUDENT GOOD GOVERNMENT AWARD
Hannah Bush
Medical College of Wisconsin

STUDENT GOOD GOVERNMENT AWARD
Angela Hayner
Concordia University Wisconsin

PSW ADVOCACY CONTRIBUTIONS

PSW offers three different advocacy contribution opportunities.
Each option serves a different purpose and has different contribution requirements:

Friends of Pharmacy Fund
Building Influence. Cultivating Relationships.

- Money goes into individual accounts associated with giver
- Funds dispersed at recommendation of PSW and direction of giver
- Used to contribute to campaign events

WISCONSIN PHARMACY PAC

- Money goes into pooled account
- Funds dispersed at direction of PSW
- Used to contribute to campaign events

LEGISLATIVE DEFENSE FUND

- Money goes into pooled account
- Funds used for non-campaign advocacy work
- Supports PSW Legislative Day, lobbyist retainer fees, and advocacy materials.

	PSW Friends of Pharmacy Fund (Conduit)	Wisconsin Pharmacy Political Action Committee (PAC)	PSW Legislative Defense Fund
Types of Contributors	Individuals	Individuals	Individuals, Businesses
Contribution Use	Political Contributions to Candidate Committees	Political Contributions to Candidate Committees	Non-Political Advocacy (e.g., PSW Legislative Day, lobbyist retainers, advocacy materials, grassroots advocacy software, etc.)
Do Contributors Specifically Allocate Their Contributions?	Yes, contributors MUST explicitly and specifically state the candidate to whom they would like to contribute and the amount they would like to contribute.	No, funds are pooled and allocated at the direction of the PSW Board of Directors.	No, funds are pooled and allocated at the direction of the PSW CEO and VP of Public Affairs.
This Is the Option for You If…	You are an individual contributor who wants to control which candidates receive your funds. You would like your name attached to specific contributions.	You are an individual contributor who would like to delegate the dispersal of your funds to PSW to contribute where the funds are most needed to impact pharmacy positively. You do not want your name attached to any specific contribution.	You are a business that would like to support PSW advocacy activities. You are an individual who would like to support PSW's grassroots advocacy activities.

MEDICAL COLLEGE OF WISCONSIN SCHOOL OF PHARMACY STUDENT WRITING CLUB:

Business Member Spotlight: William Peppard

by Abby Cruz, 2026 PharmD Candidate, Geoffrey Sarpong, 2026 PharmD Candidate

William Peppard, PharmD, BCPS, FCCM, serves as the Enterprise Pain Stewardship Coordinator at Froedtert & the Medical College of Wisconsin. He received both a Bachelor of Science and Doctor of Pharmacy in 2003 from St. Louis College of Pharmacy and completed a pharmacy practice residency in 2004 at Froedtert & the Medical College of Wisconsin. Peppard has been a member of the Society of Critical Care Medicine (SCCM) since 2003 and has won several honors and awards. In his current influential position, he spearheads the enterprise's cutting-edge approach to pain management practices and ensures adherence to the regulatory standards set by The Joint Commission, Centers for Medicare & Medicaid Services, and Det Norske Veritalis. In addition, he supports the inpatient pain consult service, Comprehensive Hospital Inpatient Pain Service (CHIPS), by rounding on patients and collaborating with the care teams to tailor pain management plans. In partnership with Dr. Gwynne Kirchen, a distinguished anesthesiologist, Peppard co-chairs the Enterprise Pain Stewardship Committee, providing education to staff members throughout the health system, driving forward not only safety and efficacy but judicious cost-effective initiatives in assessing the current state of pain management, bridging gaps, providing innovative solution utilization, and leveraging clinical decision support systems to ensure good clinical outcome to the patient. Beyond his hospital role, Peppard plays a pivotal role in shaping the education of pharmacy students and residents. He serves as an associate professor within the Medical College of Wisconsin Department of Surgery, Division of Trauma and Acute Care Surgery, and the founder and overseer of the professional medical writing rotation for the residency program.

Peppard's leadership ethos is deeply rooted in mentorship and servant leadership, reflecting his leadership and traditional family background. As a mentor, he is committed to identifying talent, sharing knowledge, and providing documented guidance reflected in his mentee's curriculum vitae. His notable influence extends across various departments due to his exceptional communication skills, ability to foster collaboration in multidisciplinary teams, and unwavering commitment to mentorship. He finds fulfillment in imparting knowledge and nurturing future mentors, significantly contributing to the specialty training programs at Froedtert. Leveraging local, regional, and national organizations such as the Pharmacy Society of Wisconsin (PSW) and the Society of Critical Care Medicine (SCCM), Peppard has created unique experiences for learners; he shares his experiences and helps them network, which ultimately helps build their confidence and professional network. He refers to this as "precepting while developing preceptors," something he and his peers have earnestly done to elevate the academic environment at Froedtert Health. His dedication to teaching is a wellspring of motivation, cultivated within a family tradition of academia and other mentors along his academic journey. Peppard recognizes the influence that his five-year internship experience at Barnes Jewish Hospital in Saint Louis, Missouri, played in early career choices, having worked with clinical pharmacist mentors Scott Micek and Dave Ritchie. Following the transition to Froedtert, he continued to grow under the mentorship of Dave Herrmann and trauma surgeon Dr. John Weigelt, who inspired his love for research, a passion that persists today. He also acknowledges the positive impact of pharmacy managers Kristin Hanson, Garrett Newkirk, and Justin Konkol in refining his communication and interpersonal skills. Integral to his personal and professional development is his wife, Sarah, whose support and inspiration have been instrumental in his holistic growth.

Accomplishments

Besides Peppard's personal and professional development, his most remarkable professional achievement lies in reshaping the research landscape of the pharmacy department. He has empowered pharmacists to autonomously lead innovative, outcome-focused research initiatives by creating a more efficient path through the research regulatory approval process. While serving as residency program director, he identified barriers in research workflow that limited pharmacists' ability to serve as principal investigators despite already assuming many of the responsibilities of that role. In collaboration with the Institutional Review Board chair, he established a pathway for pharmacists to be recognized as principal investigators, thereby gaining access to research resources and realizing newfound autonomy. This bold move paved the way for creating the Pharmacy Research Committee, a cornerstone in promoting research proposals, enhancing research quality, and supporting pharmacists in leading impactful projects. This initiative has significantly transformed the pharmacy research landscape at Froedtert, leading to a surge in publication rates, securing prestigious journal placements, and obtaining grant funding that has propelled the department's research capabilities to new heights. Peppard has two decades of publication and research experience for which he has received awards and honors for his role as senior investigator and co-investigator.

Despite these professional triumphs, Peppard's greatest accomplishment is nurturing a loving family with his wife, Sarah. Together, they have raised two extraordinary children, witnessing their growth and development with immense pride. Despite the challenges of parenthood, they have consistently strived to create a home grounded in empathy, respect, and unwavering dedication. What truly matters to Peppard and his partner is to witness their children put forth their best efforts and exhibit kindness towards others, regardless of their obstacles or academic achievements. They take profound joy in seeing their children evolve into compassionate, thoughtful individuals and cherish the life they have built together.

Today's Thoughts

Coupled with his accomplishments, awards, and certifications, Peppard shares invaluable insights into managing his various duties effectively, underlining the dynamic nature of professional and personal obligations, especially when advancing into leadership positions and as one's family grows. As an experienced pharmacist, he openly discusses how personal and professional challenges can sometimes occupy his thoughts well into the night. Early in his career, his work in the Intensive Care Unit would sometimes lead to sleepless nights pondering patient care, revisiting decisions, and questioning if the best outcomes had been achieved. Additionally, Peppard poured countless hours into SCCM, where he earned fellowship status and was lauded for his contributions. While this was a passion of his, and those efforts bolstered Froedtert's national standing in critical care pharmacy, there was a tradeoff. The personal toll of working so closely with complex patients was significant and at times a source of restlessness; this, combined with professional volunteer work, eventually led to burnout. He candidly recounts how major life events, such as the birth of his children, compelled him to temporarily step back from his career to prioritize his family, a period he views as irreplaceable. This reflective phase led him to pursue a new career path and reallocate his focus toward local and regional endeavors, including mentorship, gradually transitioning his involvement from SCCM to PSW activities.

Peppard, therefore, urges professionals, especially those in demanding sectors, to be acutely aware of their limitations and wellbeing and to make strategic choices regarding their investment of time and effort. He emphasizes the unpredictable nature of career trajectories, which often shift in response to changes in personal life. He also identifies a positive trend in workplace culture toward valuing wellbeing and work-life harmony, advocating for supportive measures like accredited training to combat burnout and workforce shortages in pharmacy.

Looking ahead, Peppard identifies crucial opportunities within the pharmacy profession, including leadership, workforce development, and adapting to the evolving healthcare landscape. He underscores the importance to equip the next generation of pharmacists with not only clinical skills, but also leadership abilities. He argues strongly for the vertical integration of pharmacists in executive roles within healthcare systems to effectively influence decisions. He also champions pharmacists' profession and legislative roles in society, advocating for their values.

Another significant focus for Peppard is the emergence of artificial intelligence (AI) in healthcare. He believes the coexistence of AI and pharmacy requires careful consideration to ensure that pharmacies can leverage AI while preserving information integrity and minimizing the potential to disseminate misinformation. Peppard calls for developing best practices for the ethical integration of AI into healthcare, both in training and clinical care, emphasizing the need for thoughtful navigation of this modern technology.

Over the course of Peppard's career, he has continued to advance in his role as a healthcare leader, gradually reducing his direct patient care duties. Though he interacts less frequently with patients, his decisions have wide-reaching effects across the enterprise. One of his major concerns is managing the unintended consequences of changes in practice. Whether it is implementing a new clinical decision support tool, a practice or power shift, or modifying medical records, Peppard understands that each decision can have an extensive impact at an organizational level. He acknowledges the challenge of predicting unexpected consequences, aware that it is impossible to anticipate them all. While some outcomes may be pleasantly surprising, others can be worrisome, potentially affecting patient care or harming the organization's reputation. This challenge—anticipating and mitigating negative unintended consequences—is now what sometimes, but less often, keeps him up at night. In tackling these challenges, Peppard emphasizes the importance of having a thorough action plan. He advocates for establishing checks and balances and maintaining open communication with stakeholders to ensure effective feedback mechanisms, allowing for early detection of issues and swift responses.

Future Advice

Peppard, in his final message, advises aspiring pharmacists to firmly anchor themselves in the power of curiosity and proactive engagement. He strongly urges these newcomers to embrace an inquisitive mindset, emphasizing the importance of asking a diverse range of situation-specific and behavioral questions and actively involving themselves in discussions with colleagues and superiors. Drawing a parallel to a child's insatiable curiosity, Peppard accentuates how questioning can deepen understanding and ignite valuable conversations because those around us often hold a wealth of experiences and knowledge that is waiting to be shared if given a chance. By fostering an environment of curiosity and collaboration, new pharmacists can gain insights and discover learning opportunities in nearly any situation while simultaneously forging significant professional connections.

Furthermore, Peppard stresses the criticality of vocal participation, urging pharmacists to initiate conversations and make an impact. This approach seldom goes unnoticed by management and leaders and instead contributes to a more robust professional network. He shares a personal anecdote where his curiosity at the bedside led to a fruitful collaboration with a head and neck surgeon, Dr. Joseph Zenga, focusing on post-operative antibiotic prescribing. This curiosity, stemming from a simple ask, resulted in a collaborative effort that secured a $150,000 grant and publication of findings in a top-tier journal; it expanded his professional network and achieved significant quality improvements in genetic mapping of infections in the peri-operative setting for cancer patients. This story vividly illustrates how a simple inquiry can lead to unforeseen opportunities.

In addition to emphasizing curiosity and engagement, Peppard recalls advice he received earlier in his career: "Just be nice." He advocates for maintaining a healthy balance between personal and professional relationships, ensuring that one sphere does not adversely impact the other. He stresses the importance of approaching interactions with consideration and kindness, and when it comes to persuasion or addressing issues, he recommends flexibility in communication. This involves finding varied ways to convey the same message to different audiences while maintaining a positive and respectful demeanor.

In conclusion, Peppard mentions a potential alteration he would make if given a chance would be to pursue a business degree earlier, ideally before the complexities of starting a family set in. He acknowledges that life's responsibilities—both professional and family commitments—intensify over time, making the early stages of one's career an optimal period for further education and skill development.

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