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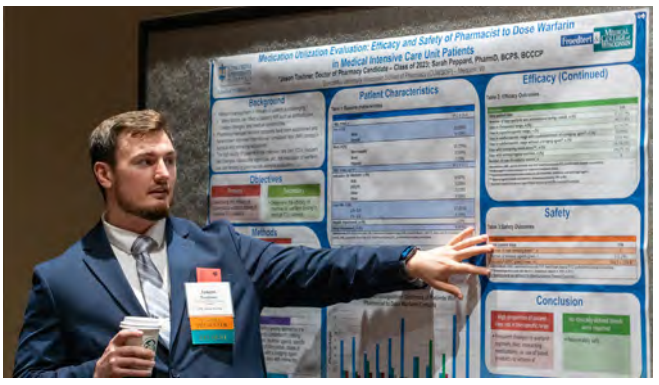
2022 PSW ANNUAL MEETING RECAP



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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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Authors are encouraged to submit manuscripts to be considered for publication in *The Journal*. For Author Guidelines, see www.jpswi.org

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UpFront:
Considering Leadership

by Janet Fritsch, RPh

During this past year as president-elect of PSW, I have had the opportunity to spend more time with leaders in PSW. As I started working with the executive board, I was at first struck by the awesome leaders these people are, amazed at the skill and energy and wisdom they bring to PSW. Then, as I got to know them, I found them to be mothers, and fathers, and friends, and dog-lovers and basically just normal people. I found in them friendship and support. I found them to be good listeners and storytellers and fun.

Last year at the Board of Directors retreat, we were asked how it happened that we pursued a leadership position with PSW. Almost everyone told a story about a specific person who reached out to them and tapped them on the shoulder and talked to them about leadership. Engaging with fellow pharmacists and technicians is powerful. Looking at who is around you and seeing the leadership qualities in them, and then reaching out to them, builds up PSW by bringing in new leadership.

People often ask, "What qualities are necessary for a good leader?" The answer is: Your qualities are necessary for a good leader. We need your qualities. We need your ideas. We need your energy. What you think and the input you have is important to those around you. Your experience and your wisdom are needed at PSW.

The other important part of being engaged and involved in PSW is … it just makes me feel better. When I have a busy or difficult day at work, a Zoom meeting with the membership engagement group pumps me up. When I have a good day, it is great to share it with those on the independent pharmacy Zoom. Being with other pharmacists who share your passions, whether they work in similar or different pratice settings, just makes you feel good. Attending the Annual Meeting or educational conference or Legislative Day with others in the pharmacy practice energizes and inspires. When you are feeling overwhelmed by your job or your responsibilities, it helps to reach out to a fellow pharmacist friend in PSW. We can be a support to each other.

Are you feeling encouraged to be more engaged and involved in PSW? Maybe to look for a leadership opportunity? Check out the Ladder of Membership Involvement on the PSW website. It lists ways to be involved and ways to be a leader at PSW.

I want to leave you with a quote from John Quincy Adams: "If your actions inspire others to dream more, learn more, do more and become more, you are a leader." You are passionate about pharmacy, you are passionate about caring for your patients, and you want to share that with others in pharmacy. So, concerning your engagement and leadership in PSW: What's next?

Janet Fritsch is the President of the Pharmacy Society of Wisconsin in Madison, WI.

The Ladder of Membership Involvement

LETTER FROM THE EDITOR:

Welcome Michael Nagy to *JPSW*

by Amanda Margolis PharmD, MS, BCACP

It is my pleasure to introduce Michael Nagy, PharmD, BCACP as the new Associate Editor of *JPSW*! Dr. Nagy started in this role in November 2022 but has been involved in *The Journal* in many ways prior to this appointment.

Dr. Nagy graduated from the University of Wisconsin-Madison School of Pharmacy with his PharmD and completed two years of ambulatory care residency training at the William S. Middleton Memorial Veterans Hospital in Madison, WI. Dr. Nagy is an Assistant Professor at the Medical College of Wisconsin (MCW) School of Pharmacy and is passionate about teaching and mentoring student pharmacists. He focuses on using population health management to build critical-thinking skills and provide evidenced-based, compassionate, and proactive care to patients. His teaching focuses on geriatrics, endocrinology, urology, and pain therapeutics. He is also a clinical pharmacy specialist in primary care at the Clement J. Zablocki VA Medical Center in Milwaukee.

Dr. Nagy has served on the *JPSW* Editorial Advisory Committee for several years, and more recently became a peer review coordinator. In addition to this role, he serves as the advisor for the MCW School of Pharmacy *JPSW* student writing club, where he coordinates and mentors student writing experiences. He has also been a long-standing and consistent article contributor and peer reviewer for *JPSW* and has made recommendations and updates to *The Journal's* processes.

More recently, Dr. Nagy has also helped to launch and evaluate journal initiatives.[1] He organized and implemented a survey of *JPSW's* student writing clubs, which led to improvements in the student writing club program, state and national publication, and the development of the PSW Emerging Writers Program.[2-4] Dr. Nagy then participated in the Emerging Writers Program and presented module 5: "Structuring a Paragraph." He also presented journal-related content at the 2022 PSW Annual Meeting on "Transforming A Project into a Publishable Manuscript."[5]

This year, Dr. Nagy was the 2022 awardee of the Curtis A. Johnson Award. The award recognizes an outstanding contributor to *JPSW* during a calendar year. In this case, it represented an individual with a longstanding history of significant contributions to *The Journal*.

We look forward to incorporating Dr. Nagy's talents and ideas into *The Journal*. We excitedly welcome Dr. Nagy to the *JPSW* staff.

Amanda Margolis is the Pharmacist Editor for the *Journal of the Pharmacy Society of Wisconsin*.

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PHARMACIST & TECHNICIAN CE:

Gender-Affirming Care for Transgender Patients

by Ariana Double, 2023 PharmD Candidate, Anna Marceau, PharmD, Marie Moser, PharmD

CE FOR PHARMACISTS — COMPLETE ARTICLE AND CE EXAM AVAILABLE ONLINE: **WWW.PSWI.ORG**

Learning Objectives

- Explain the current healthcare disparities for transgender patients
- Define and explain appropriate terminology necessary for gender-affirming care
- Explain best practices to create an affirming space for patients
- Assess appropriate gender-affirming treatment regimens
- Assess physical changes and risks associated with gender-affirming treatments

CE FOR TECHNICIANS — COMPLETE ARTICLE AND CE EXAM AVAILABLE ONLINE: **WWW.PSWI.ORG**

Learning Objectives

- Explain the current healthcare disparities for transgender patients
- Define and explain appropriate terminology necessary for gender-affirming care
- Explain best practices to create an affirming space for patients

Cultural humility involves continual self-reflection with the goal of creating honest and trustworthy relationships to understand and eliminate healthcare disparities.[1] A practice with perpetual reflection and cultural humility at its core is the first step in addressing the healthcare disparities that affect many patients. A good place to start the conversation about culturally sensitive healthcare is to address the disparities and barriers to care that are routinely experienced by transgender patients.

Recent data regarding these disparities has exposed the need for healthcare professionals to understand the major inequality transgender patients face. For healthcare to become a safe space for transgender patients, providers must understand the broader history of transgender discrimination. A 2011 National Transgender Discrimination Survey brought to light many alarming disparities.[2] Among the survey respondents, 25% had experienced some form of discrimination within the past year, and 78% reported being bullied. Unfortunately, this discrimination is observed in healthcare spaces as well. Around 25% of transgender patients have delayed care due to past discrimination or fear of being mistreated. The survey reported that 19% of transgender patients had been denied care outright. Another finding of this study is that around 50% of respondents reported having to teach their healthcare providers about their own healthcare. This highlights many providers' gaps in knowledge when it comes to treating transgender patients. It is important that we acknowledge personal shortcomings and educate ourselves to be able to meet the needs of patients. The 2015 U.S. Transgender Survey showed findings similar to those of the 2011 survey.[3] System-wide barriers also impact patient care. Twenty-five percent of survey respondents reported experiencing insurance issues related to transgender care within the past year. The disparities and barriers to care experienced by transgender patients must be addressed to create affirming environments for patients to safely seek medical care.

The use and understanding of appropriate medical terminology are fundamental in creating a safe and welcoming environment to provide healthcare. The following list includes some commons terms that healthcare providers should understand and use in practice. Please note that this is not an exhaustive list.[4,5]

- **Sex assigned at birth:** Refers to the chromosomes and gonads, the external genitalia that a person had at birth and was assigned by someone else
- **Pronouns:** A way to address an individual, a grammatical function of speech. Proper pronoun identification allows for respectful communication.
  - » Examples: They/Them/Theirs, She/Her/Hers, He/Him/His, etc.
- **Gender Identity:** A person's sense of self, how they perceive themselves; this can be the same or different from their sex assigned at birth
- **Non-binary:** Gender fluid/gender expansive, used to describe someone who does not identify as singularly male or female
- **Gender expression:** External expression of one's gender identity;

how one expresses themselves through haircut, voice, clothing, etc.

- **Cisgender:** A person whose gender identity is the same as the sex they were assigned at birth
- **Transgender:** A person whose gender identity differs from the sex they were assigned at birth
- **Preferred Name:** The name that a person prefers to go by; this may differ from the name assigned to them at birth, the one present on their driver's license, etc.
- **Dead Name:** The previous name of someone who has since changed their name; typically, this refers to a person's pretransition name—a name they no longer identify with. It is never acceptable to use someone's dead name.
- **Sexual orientation:** One's inherent emotional, romantic, or sexual attraction to other people, as defined by the person
- **Gender dysphoria:** Clinically significant distress caused when a person's sex assigned at birth does not align with their gender identity
- **Gender-affirming care:** Social, psychological, behavioral, or medical interventions that support and affirm an individual's gender identity

An Affirming Environment for Safe Healthcare

Creating a safe space for transgender patients to feel welcome and comfortable seeking care is an important step in addressing the barriers and disparities that many patients face. An affirming environment is one where a patient feels welcome, respected, represented, and heard. A key aspect in providing care to transgender patients is to remember that all patients deserve the same respect. Every healthcare provider must reflect, assess, and address any personal biases before they can create an honest and trustworthy relationship with their patients. Individual and system-wide changes likely need to be made within your practice to promote a safe space for all patients.

One of the easiest individual changes that can be made to promote an affirming environment happens at the initiation of any patient encounter. As the provider, introduce yourself with your name and pronouns at the beginning of each patient interaction. The use of your own pronouns demonstrates that you as the healthcare professional respect the patient's gender identity. Never assume a patient's name, pronouns, gender identity, or sexual orientation. That information must be granted to the provider by the patient once the provider has established a safe environment for the patient to share. We recommend asking non-discriminatory and non-leading questions, such as:

- "What name should I use when addressing you?"
- "What pronouns do you use?"
- "What gender do you identify as?"
- "What is your sexual orientation?"

Do not make assumptions about a patient based on one aspect of their identity. For example, based on someone's pronouns, you cannot assume their sexual orientation. Use these best practices when speaking not only to patients but to coworkers and employees, too. Social affirmations, like the use of pronouns, are a fundamental aspect of gender-affirming care. As healthcare professionals, we are the advocates for our patients, and it is up to us to progress change when it can help meet our patients' needs.

Another step in creating an affirming healthcare space includes physical affirmations. These are visual cues that indicate to patients that your practice is a safe space. Visual cues might be the inclusion of pronouns on name badges, emails, Zoom meetings, and other visual platforms. You might offer brochures that include transgender health and LGBTQ+ health initiatives, LGBTQ+ symbols and other resources. Medical forms that include options for more than simply "male" and "female" demonstrate that all patients are welcome. Additionally, non-discriminatory policies that are echoed in the actions and words of staff can highlight that your practice is a safe space.

An affirming environment holds all staff, patients, and customers to standards that promote a safe and welcoming space. For an environment to be inclusive, it is the responsibility of staff to step up and speak out against harassment and bias. Learning for Justice, an organization that offers educational resources, provides four essential steps in eliminating bias:[6]

1. To interrupt and speak up when harassment or bias remarks are heard or said.
2. To question and ask the speaker why they made the offensive remark.
3. To educate and explain to the speaker why the remark can be offensive and discuss alternate phrases.
4. To echo, express support, and reiterate the antibias message.

TABLE 1. Typical Hormone Therapy Dosages

Hormone Therapy	Drug Class	Drug Type	Dosage
Feminizing Therapy	Estrogen	Oral Estradiol	2-6mg/day
		Estradiol Transdermal Patch	0.025-0.2mg/day
		Estradiol Valerate or Cypionate	5-30mg IM every 2 weeks 2-10mg IM every week
	Anti-androgens	Spironolactone	100-300mg/day
		Cyproterone Acetate	25-50mg/day
	GnRH Agonist		11.25 SQ 3-monthly
			3.75mg SQ monthly
Masculinizing Therapy	Testosterone	Testosterone Enanthate or Cypionate	100-200mg SQ every 2 weeks
		Testosterone Undecanoate	1000mg every 12 weeks
		Testosterone gel 1.6%	50-100mg/day
		Testosterone Transdermal Patch	2.5-7.5mg/day

GnRH = Go; IM = intramuscular; SQ = subcutaneous

Even if these steps are not executed perfectly, it is important to intervene, diffuse the situation, and correct the behavior. A zero-tolerance policy for hate, harassment, and bias will be reflected in the welcoming environment it creates for patients.

One of the biggest concerns many professionals face when interacting with patients is fear of making a mistake. As in all aspects of life, it is only human to make mistakes. Do not let hesitation or fear of making a mistake stop you from giving a patient the care they deserve. The most important part of making a mistake is your response after it has occurred. Immediately apologize and correct the mistake if you make one. Make it a point to understand why the mistake was made and what can be done to never make the mistake again. Be open to feedback from patients and colleagues, and be willing to learn.

Gender-Affirming Care in Adolescents

Puberty-Suppressing Hormones

Gender-affirming care is considered medically necessary. Gender-affirming care is different for adolescents, compared to adults, and considerations should be made in light of this. Early use of gender-affirming care can help prevent the negative social and emotional consequences of gender dysphoria. A study by Nuttbrock et al. concluded that the refusal of timely medical interventions in adolescents may perpetuate gender dysphoria.[7] Additionally, the authors found that without early intervention, psychological and physical gender-related abuse had a large impact on depression. It was also found that individuals adjust better when they are treated earlier. In addition to decreasing harassment and negative social outcomes, puberty-suppressing hormones can be lifesaving. Cohen-Kettenis et al. found that puberty-suppressing hormones reduce suicide risk in transgender patients.[8] It is important to note that some states across the U.S. are beginning to criminalize puberty-suppressing hormone use in adolescents, so it is more important than ever for us as providers to advocate for these life-saving treatments for our patients.

Treatment decisions should be made between the adolescent, the family, and the treatment team. Patient goals, risks, and benefits should be discussed when considering initiation of therapy. More discussion regarding the initiation of gender-affirming therapy can be found at WPATH.org.

The typical goal of gender-affirming care for adolescents is to delay the development of secondary sex characteristics. This includes development of breasts, facial hair, changes of the pitch of voice, etc. There are three categories of interventions for adolescents: fully reversible interventions, partially reversible interventions, and irreversible interventions. Fully reversible interventions typically include Gonadotropin-releasing hormone (GnRH) analogues, progestins, and other anti-androgens to suppress hormone production and delay the development of physical changes in puberty. Partially reversible interventions include masculinizing and feminizing hormone therapy. Irreversible interventions are surgical procedures. The preferred treatment for both masculinizing and feminizing therapy in adolescents is GnRH analogues.[9] For adolescents who were assigned male at birth, GnRH analogues will stop luteinizing hormone secretion which will stop testosterone secretion. For adolescents who were assigned female at birth, GnRH analogues will stop the production of estrogen and progesterone. The hormone therapy regimens for adolescents differs from those of adults, due to considerations of the physical, emotional, and mental development aspects of the adolescent years.

Coordination among the care team is important to ensure physical development is being monitored while the adolescent is

TABLE 2. Masculinizing Hormone Therapy Effects

Effect	Expected Onset	Expected Maximum Effect
Skin oiliness/ acne	1-6 months	1-2 years
Facial and body hair growth	3-6 months	3-5 years
Scalp hair loss	>12 months	Variable
Increased muscle mass and strength	6-12 months	2-5 years
Body fat redistribution	3-6 months	2-5 years
Cessation of menses	2-6 months	1-2 years
Clitoral enlargement	3-6 months	1-2 years
Vaginal atrophy	3-6 months	1-2 years
Deepened voice	3-12 months	1-2 years

From WPATH Standards of Care[11]

TABLE 3. Feminizing Hormone Therapy Effects

Effect	Expected Onset	Expected Maximum Effect
Body fat redistribution	3-6 months	2-5 years
Decreased muscle mass and strength	3-6 months	1-2 years
Increased muscle mass and strength	6-12 months	2-5 years
Softening of skin and decreased oiliness	3-6 months	Unknown
Decreased libido	1-3 months	1-2 years
Decreased spontaneous erections	1-3 months	1-2 years
Male sexual dysfunction	Variable	Variable
Breast growth	3-6 months	2-3 years
Decreased testicular volume	3-6 months	2-3 years
Decreased sperm production	Variable	Variable
Thinning and slowed growth of body and facial hair	6-12 months	>3 years
Male pattern baldness	No regrowth, loss stops 1-3 months	1-2 years

From WPATH Standards of Care[11]

receiving treatment. The World Professional Association for Transgender Health (WPATH) recommends that a pediatric endocrinologist is a part of the care team.[11] Assessment of development should be completed every 3-6 months. Appropriate height and bone mineral density should be observed every 6-12 months to ensure that developmental standards are met.

Gender-affirming Care in Adults

Hormone Therapy

Similar to puberty-suppressing therapy, hormone therapy in adults must be constructed based on the patients' goals with a discussion regarding the risks and benefits of therapy. Hormone therapy can provide comfort to patients as it can minimize the distress many experience. Hormone therapy increases quality of life, self-esteem, and decreases anxiety.[12] Hormone therapy is a medically necessary intervention that involves the use of exogenous endocrine therapy to cause feminizing or masculinizing changes. Feminizing hormone therapy typically includes estrogen, antiandrogens, and GnRH agonists. Use of ethinyl estradiol and conjugated equine estrogens are not recommended. Masculinizing hormone therapy typically includes testosterone and potentially progestins.

Physical Effects of Hormone Therapy

Feminizing and masculinizing hormone therapy induce physical changes intended to further align a patient's physical appearance with their gender identity. The physical effects vary between feminizing and masculinizing therapy. Most physical changes occur over the course of approximately 2 years. It is important for pharmacists to be aware of physical changes associated with hormone therapy and the time it takes to reach those outcomes to properly counsel patients. Masculinizing hormone therapy is expected to cause a deepening of the voice, clitoral enlargement, growth in facial and body hair, cessation of menses, atrophy of breast tissue, and decreased percentage of body fat compared to muscle mass. Feminizing hormone therapy is expected to cause breast growth, decreased erectile function, decreased testicular size, and increased percentage of body fat compared to muscle mass. The degree of physical changes experienced by a patient depends on the dose, route of administration, and medications within their therapy plan to align with their goals. Tables 3 and 4 describe the physical changes of hormone therapy and time to expected effect.

For both feminizing and masculinizing therapy, hormone levels should be measured to ensure that endogenous hormones are suppressed and administered hormones are maintained within the normal physiologic range for the affirmed gender. The target range of estradiol is 100-200pg/mL for transgender women. The target range of testosterone is 300-1000ng/dl for transgender men. Physical changes should be monitored every 3 months during the first year of treatment, then yearly thereafter. Physical changes should be discussed before

TABLE 4. Risks Associated with Feminizing Hormone Therapy

Risks	*Risk Level*
Venous Thromboembolic Disease*	Likely increased risk
Gallstones	Likely increased risk
Elevated liver enzymes	Likely increased risk
Weight gain	Likely increased risk
Hypertriglyceridemia	Likely increased risk
Cardiovascular disease	Likely increased risk with other risk factors present
Hypertension	Possible increased risk
Hyperprolactinemia or prolactinoma	Possible increased risk
Type 2 diabetes	Possible increased risk with presence of additional risk factors
Breast Cancer	No increased risk or inconclusive

**It is important to note that the risk of Venous Thromboembolic Disease (VTE) is the same risk that a cisgender female on estrogen therapy faces. Estrogen increases the risk of VTE regardless of its indication and therefore informed consent should be the foundation of this therapeutic decision.*

TABLE 5. Risks Associated with Masculinizing Hormone Therapy

Risks	*Risk Level*
Polycythemia	Likely increased risk
Weight gain	Likely increased risk
Acne	Likely increased risk
Androgenic alopecia (balding)	Likely increased risk
Sleep apnea	Likely increased risk
Elevated liver enzymes	Possible increased risk
Hyperlipidemia	Possible increased risk
Destabilization of certain psychiatric disorders	Possible increased risk with presence of additional risk factors
Cardiovascular disease	Possible increased risk with presence of additional risk factors
Hypertension	Possible increased risk with presence of additional risk factors
Type 2 diabetes	Possible increased risk with presence of additional risk factors
Loss of bone density	No increased risk or inconclusive
Breast/ cervical/ ovarian/ uterine cancer	No increased risk or inconclusive

therapy initiation and should be congruent with the patient's desires.

Risks Associated with Hormone Therapy and Assessments

As with any medical therapy, there are risks associated with treatment. The adverse effects of hormone therapy are dependent on a variety of factors, including but not limited to medication chosen, dose, route of administration, and specific patient characteristics.[11] A discussion of the benefits and risks of therapy with informed consent is an important aspect of gender-affirming care.

Baseline assessments and lab values should be established and monitored throughout therapy. For feminizing hormone therapy, an assessment of cardiovascular impairment via fasting lipid panels, diabetes screenings and other diagnostic tools should be completed. Additionally, blood pressure measurement, weight, pulse, heart and lung function, and examination of peripheral edema should be evaluated. As with feminizing hormone therapy, baseline and continual assessments and lab values should be completed for masculinizing hormone therapy. Assessments should include a pregnancy test, heart function, weight, and hematocrit. For all patients receiving hormone therapy, lab values should be monitored every 3 months during the first year of treatment, then yearly thereafter. Additional risks and risk assessments are described by WPATH.[11]

Efficacy of Hormone Therapy

A patient's goals for therapy and clinical response to therapy is the best indication of therapy efficacy.

Action Items for Pharmacists

There are many calls to action for pharmacists when it comes to gender-affirming care. One important call is to become educated on gender-affirming care and to enlighten other coworkers, staff, family, and friends. An important part of learning about transgender patients is to engage with the transgender community inside and outside of work. The best way to learn about a community is through the people within the community. Reading books, watching documentaries, and listening to podcasts produced by the transgender community are all great ways to expand your knowledge. Conducting affirming research is a huge area for growth within healthcare. Work on, organize, and delegate projects that are focused on transgender health. Create and use visual and physical affirmations throughout your workplace and community. Stand up to bias and harassment. Advocate on behalf of your patients and community for changes that improve transgender health and acceptance.

Conclusion

Cultural humility is a pillar for equitable and accurate patient care. Advocating for patients in creating an affirming environment is crucial in the pursuance of decreasing barriers and addressing disparities in transgender healthcare. Individual and system-wide assessments and modifications are required to create an inclusive environment for all patients. Through implementation of social and physical affirmations, healthcare providers can demonstrate to patients who have experienced discrimination that they are safe and heard in medical settings. Please note that the resources listed below can guide you in further learning on equitable transgender health.

Please visit WPATH and the Endocrine Society Guidelines for more information on gender-affirming care.

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Pharmacist Assessment Questions

1. Why is the use of pronouns important?
   a. Creates an affirming environment
   b. Indicates respect for a patient's gender identity
   c. Identifies preferred language when speaking to someone
   d. All of the above
2. What is the definition of gender identity?
   a. A person's sense of self
   b. How one expresses themselves through haircut, voice, clothing, etc.
   c. Social, psychological, behavioral, or medical interventions that support and affirm an individual's gender identity
   d. Emotional or sexual attraction to other people defined by the person,
3. What is an affirming environment?
   a. A safe space where a patient feels welcome
   b. A space where a patient is respected
   c. A space where a patient is represented
   d. All of the above
4. What social affirmations should be implemented within a safe healthcare space?
   a. Use of pronouns
   b. Assuming patients name on medical records is preferred name
   c. Assuming a patient identifies as the sex indicated on their medical records
   d. Use of dead names
5. What risks should be monitored in feminizing hormone therapy?
   a. acne
   b. androgenic alopecia
   c. sleep apnea
   d. hypertriglyceridemia
6. Why is initiation of puberty suppressing hormones important?
   a. Decreases suicide risk
   b. Decreases abuse associated with stigma
   c. Decreases anxiety
   d. Decreases depression
   e. All of the above
7. Which of the following should not be used in hormone therapy?
   a. Testosterone cypionate
   b. Ethinyl estradiol
   c. Spironolactone
   d. GnRH agonists
8. Which of the following are visual affirmations?
   a. Pronouns indicated on name badges
   b. LGBTQ+ signage
   c. Non-discriminatory policies
   d. All of the above
9. Did the activity meet the stated learning objectives? (if you answer no, please email sarahs@pswi.org to explain)
   a. Yes
   b. No
10. On a scale of 1 – 10 (1-no impact; 10-strong impact), please rate how this program will impact the medication therapy management outcomes or safety of your patients.
11. On a scale of 1 – 10 (1-did not enhance; 10-greatly enhanced), please rate how this program enhanced your competence in the clinical areas covered.
12. On a scale of 1 – 10 (1-did not help; 10-great help), please rate how this program helped to build your management and leadership skills.
13. How useful was the educational material?
   a. Very useful
   b. Somewhat useful
   c. Not useful
14. How effective were the learning methods used for this activity?
   a. Very effective
   b. Somewhat effective
   c. Not effective
15. Learning assessment questions were appropriate.
   a. Yes
   b. No
16. Were the authors free from bias?
   a. Yes
   b. No
17. If you answered "no" to question 16, please comment (email info@pswi.org).
18. Please indicate the amount of time it took you to read the article and complete the assessment questions.

Technician Assessment Questions

1. Why is the use of pronouns important?
   a. Creates an affirming environment
   b. Indicates respect for a patient's gender identity
   c. Identifies preferred language when speaking to someone
   d. All of the above
2. What is the definition of gender identity?
   a. A person's sense of self
   b. How one expresses themselves through haircut, voice, clothing, etc.
   c. Social, psychological, behavioral, or medical interventions that support and affirm an individual's gender identity
   d. Emotional or sexual attraction to other people defined by the person,
3. What is an affirming environment?
   a. A safe space where a patient feels welcome
   b. A space where a patient is respected
   c. A space where a patient is represented
   d. All of the above
4. What social affirmations should be implemented within a safe healthcare space?
   a. Use of pronouns
   b. Assuming patients name on medical records is preferred name
   c. Assuming a patient identifies as the sex indicated on their medical records
   d. Use of dead names
5. Why is initiation of puberty suppressing hormones important?
   a. Decreases suicide risk
   b. Decreases abuse associated with stigma
   c. Decreases anxiety
   d. Decreases depression
   e. All of the above
6. Which of the following are visual affirmations?
   a. Pronouns indicated on name badges
   b. LGBTQ+ signage
   c. Non-discriminatory policies
   d. All of the above
7. Did the activity meet the stated learning objectives? (if you answer no, please email sarahs@pswi.org to explain)
   a. Yes
   b. No
8. On a scale of 1 – 10 (1-no impact; 10-strong impact), please rate how this program will impact the medication therapy management outcomes or safety of your patients.
9. On a scale of 1 – 10 (1-did not enhance; 10-greatly enhanced), please rate how this program enhanced your competence in the clinical areas covered.
10. On a scale of 1 – 10 (1-did not help; 10-great help), please rate how this program helped to build your management and leadership skills.
11. How useful was the educational material?
   a. Very useful
   b. Somewhat useful
   c. Not useful

12. How effective were the learning methods used for this activity?
    a. Very effective
    b. Somewhat effective
    c. Not effective
13. Learning assessment questions were appropriate.
    a. Yes
    b. No
14. Were the authors free from bias?
    a. Yes
    b. No
15. If you answered "no" to question 14, please comment (email info@pswi.org).
16. Please indicate the amount of time it took you to read the article and complete the assessment questions.

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PHARMACIST CE:

Pharmacist's Role in Demystifying the Fears of Biosimilar Humira® Use in Rheumatology

by Michael Nome, 2024 PharmD Candidate, Judy Zheng, 2024 PharmD Candidate, Brandon Stevens, 2024 PharmD Candidate, Shayne Hughes, 2024 PharmD Candidate, Chinh Kieu, 2023 PharmD Candidate

Rheumatic diseases and their related conditions create a significant burden on the US healthcare system, as approximately 1.3 million adults live with rheumatoid arthritis or other rheumatic illnesses.[1] Biologics have an expansive role in the treatment of rheumatic diseases, paving the way for their respective biosimilars. Fifty-two percent of patients with RA use a biologic, with an estimated annual cost of $36 billion dollars.[2,3] Compared to conventional, small-molecule drugs, biologics or biological products are larger and more complex preparations derived from living organisms, including animal cells, human cells, and microorganisms.[3] These products are composed of a single entity or a combination of proteins, carbohydrates, and nucleic acids, among other constituents.[4] Examples of currently marketed biologics include monoclonal antibodies, therapeutic proteins, and vaccines. These Food and Drug Administration-regulated products have many therapeutic indications that target a wide range of medical conditions, such as RA, diabetes, and multiple sclerosis.[4]

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Learning Objectives

- Recognize the current climate and trend of biosimilar use in rheumatology
- Acknowledge various challenges delaying the adoption of biological products
- Describe the FDA regulatory pathway for biosimilars and the impact of patents on patient care
- List various strategies used to support biosimilar uptake
- Articulate the relevance of biosimilar use to practicing pharmacists
- Recognize how pharmacists in different practice settings can be leveraged to improve biosimilar accessibility

Abstract

Rheumatic diseases are prevalent in the United States, and the number of patients with rheumatic conditions is only expected to grow. Biological therapies play an extensive role in the treatment of these diseases, paving the way for the use of associated biosimilars. Several barriers persist and prevent effective use of biosimilars for these conditions. Patient and provider perception, confusion surrounding nomenclature, and the inherent complexity of biosimilar development all present challenges to the incorporation of biosimilars in rheumatology. With these barriers in mind, pharmacists play a vital role in expanding biosimilar use, from those practicing at the community level to those representing the pharmaceutical industry. Where biosimilars are concerned, pharmacists can help improve patient care and quality of life for patients, as well as help increase medication access and reduce costs.

ACA - Affordable Care Act
ACR - American College of Rheumatology
AS - Ankylosing spondylitis
AWP - Actual wholesale price
BLA - Biologic license application
BPCIA - Biologics Price Competition and Innovation Act
CE - Continuing education
CPOE - Computerized prescriber order entry
EMR - Electronic medical record
FDA - Food and Drug Administration
HCP - Health care providers
IBM - International Business Machines
KOL - Key opinion leader
mAb - Monoclonal antibody
MPR - Medication possession ratio
MS - Multiple sclerosis
P&T - Pharmacy and therapeutics
PBM - Pharmacy benefits manager
PDC - Proportion of days covered
PsA - Psoriatic arthritis
PSP - Patient support program
RA - Rheumatoid arthritis
RAPID3 - Routine assessment of patient index data 3
RCT - Randomized controlled trial
TNF-α - Tumor necrosis factor-alpha
US - United States
VAS - Visual analog scale

Similarities and Differences between Brand-Generics and Biologics-Biosimilars

Conceptually, the relationships between brand-name and generic medications and those between biologics and biosimilars are very much alike. For instance, the initiation of commercialization for biosimilars and generics depends on the expiration of brand-name medications' patents and market exclusivity. Like their brand-named counterparts, biologics serve as a reference or originator product for biosimilars. However, unlike small-molecule drugs where the brand and generics have identical chemical structures, a biosimilar only highly resembles its reference biological product, due to its size and complexity. Additionally, as part of the enactment of the Affordable Care Act, the FDA was granted authority to license biosimilars via the biologics license application (BLA).[1] Under this legislation, the biosimilar sponsor has access to the preclinical and clinical data of biologics, permitting an abbreviated approval process for biosimilars.[5] Following approval, the FDA performs post-marketing surveillance of all biological products to ensure safety and efficacy in clinical use.[3,5] Nonetheless, the differences between biosimilars and the FDA-approved reference product are not considered clinically significant.[5] The currently approved biosimilars are listed in Table 1.

Biosimilars and Increased Patient Access to Disease-Modifying and Lifesaving Medication in Rheumatology

Cost is a major barrier to implementing biological medications for the treatment of complex disease states; these products are difficult to manufacture, less durable than small molecule drugs, and often require special storage conditions. It can be difficult to recommend biological agents as first-line treatment for a disease such as RA because of the cost. The total overall cost of RA medications in April 2018 was estimated at $20 billion dollars, and it was predicted during a review that it would reach $36 billion dollars by 2021.[6] Infliximab biosimilars have been available since 2013, allowing considerable price discounts for patients in some regions.[7] These discounts proposed by the biosimilar manufacturer increase access to medications that could have substantial positive effects on patients' quality of life. Since biosimilars do not require clinical trials for FDA approval, manufacturers can lower the actual wholesale price of the drug by excluding the cost of the trials, thus increasing the affordability of the drug.[5] For example, a reference product, Remicade® (infliximab), had an AWP of $1,401.38 per 100-mg vial in September of 2020.[5] This price can be compared to three biosimilars on the market, where during the same time period, the cost of Inflectra® was $1,135.54, Renflexis® was $904.07, and Avsola® was $600.[5] Another factor facilitating increased patient access to biological products is insurance formulary preference. This is driven by the lower costs of biosimilars; therefore, insurance companies prefer to cover biosimilars as opposed to the more expensive biologics on their formulary. It is important to understand that biosimilars offer greater affordability without giving up therapeutic performance to reference product biologics, and the discounted rate can make a meaningful impact to patients.

Humira and its Biosimilars

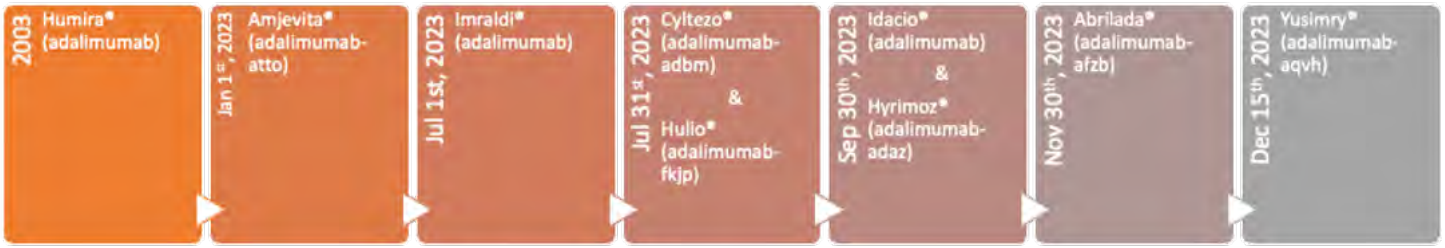
Adalimumab (Humira®) is a prime example of a biological product that demonstrates how the cost-effectiveness of biosimilars can increase patient accessibility. This marketed biological product has altered the treatment course of many debilitating diseases, including RA, Crohn's disease, and psoriasis.[2] Moreover, Humira® is a top-selling medication globally.[8] The medication dominates the market, having more than double the number of sales of the second highest-selling medication in 2018.[9] AbbVie generated $19 billion in global sales from Humira® (adalimumab) in 2019, of which $15 billion came from the US alone.[8] With that said, AbbVie currently faces the challenge that all drug manufacturers fear in an expiring patent. This threat to the

TABLE 1. Current Rheumatologic Biologic and Biosimilar Therapies

Biologic (brand name)	*Drug class*	*Indications*	*Approved biosimilars*
Adalimumab (Humira)	TNF-a inhibitor	Ankylosing spondylitis, Crohn's disease, hidradenitis suppurativa, psoriasis, rheumatoid arthritis, ulcerative colitis, and uveitis	Abrilada (adalimumab-afzb) Amjevita (adalimumab-atto) Cyltezo (adalimumab-adbm) Hadlima (adalimumab-bwwd) Hulio (adalimumab-fkjp) Hyrimoz (adalimumab-adaz) Yusimry (adalimumab-aqvh)
Etanercept (Enbrel)	TNF-a inhibitor	Ankylosing spondylitis, graft-vs-host disease, psoriasis, and rheumatoid arthritis	Erelzi (etanercept-szzs) Eticovo (etanercept-ykro)
Infliximab (Remicade)	TNF-a inhibitor	Ankylosing spondylitis, Crohn's disease, psoriasis, rheumatoid arthritis, sarcoidosis, and ulcerative colitis	Avsola (infliximab-axxq) Inflectra (infliximab-dyyb) Ixifi (infliximab-qbtx)A Renflexis (infliximab
Rituximab (Rituxan)	CD20+ B-cell inhibitors	Non-Hodgkin's Lymphoma, Chronic Lymphocytic Leukemia, lupus nephritis, and rheumatoid arthritis (not an exhaustive list)	Riabni (rituximab-arrx) Ruxience (rituximab-pvvr) Truxima (rituximab-abbs)

At the time of this writing, there are four biologics indicated for rheumatological diseases each with their accompanying biosimilars.[5] Biosimilars for infliximab and rituximab are currently available, while adalimumab and etanercept biosimilars are expected to come to market within the next five years.[1] As the development of biosimilars continues to grow and treatment options expand, pharmacists must stay up to date to support patients' access to these traditionally expensive medications.

FIGURE 1. Anticipated Release Dates of Humira® and its Biosimilars in the U.S.



Timeline of Humira® release date, along with the approval and planned release dates of its accompanying biosimilars. Adopted from Coghlan J et al.

company's profit margin is an opportunity for the entry of competitors in the form of biosimilars, which is bound to reinstate cost control of this medication on the market. In a study conducted by Lee and colleagues in 2021, Medicare could have saved $2.19 billion on reported adalimumab spending if there had been a biosimilar alternative after accounting for rebates between 2016 and 2019.[8]

When focusing on the patient cost of biologics, a study performed by the American College of Rheumatology (ACR) suggests that although most people with rheumatic ailments have insurance, six out of ten patients struggle to pay for their medications.[10] The study revealed that patients are burdened by expensive biologics due to their market monopoly. Considering the economic strain on patients, the federal health programs, and health systems alike, it further highlights the need for pharmacists to be invested in improving biosimilar uptake and patient access to these life-altering medications.[8]

The FDA has already approved seven biosimilars to adalimumab; however, they will not be launched until 2023 due to patent disputes with AbbVie (Figure 1).[9] Timely marketing of new biosimilars will be crucial to ensuring that the US healthcare system has more treatment options and cost savings available for patients.[8] With the imminent patent expiration in 2023, the impact of biosimilars on market cost, patient accessibility, treatment course of numerous diseases, and overall market equilibrium is highly anticipated.

Current and Potential Challenges to Incorporating Adalimumab Biosimilars into Rheumatology Practice

Some of the current challenges to biosimilar uptake in rheumatology are patient nocebo effects, payor reimbursement issues, negative patient perception, confusion surrounding naming and labeling, lack of confidence in its use of extrapolated indications, and prescribers' fear of crossover immunogenicity and subpar efficacy.[11] The nocebo effect can be defined as a patient's negative expectation of treatment that leads to suboptimal efficacy unrelated to the physiological effect of the medication.[12] This negative perception is clear in Frantzen et al's French nationwide survey on 629 patients' perceptions of biosimilars.[13] The team found that patients were reluctant to switch to biosimilars even if it was required by their disease state.[13] Addressing this nocebo issue is important, because it has the potential to give the patient or provider a false perception that biosimilars are inferior. The problem associated with payor reimbursement is evident in some insurance profit-oriented practices, such as the use of a single-source mandate to prevent coverage of specific biosimilars. For instance, Chambers and colleagues revealed that only 14% of biosimilars were granted preferred coverage out of 535 decisions issued by plans.[14] Alternatively, originator manufacturers may use existing price rebates as an incentive to prevent insurance companies and pharmacy benefit managers (PBM) from adding biosimilars to their formulary.[10]

Another barrier to biosimilar uptake is the complexity of nomenclature. Regulatory requirements mandate the inclusion of the four unique, clinically insignificant suffixes added at the end of the originators' and the biosimilars' statement: "BIOSIMILAR-xxxx is a biosimilar to ORIGINATOR," followed by a disclosure indicating that the two medications are highly similar with no clinically meaningful differences.[7] The suffix and the biosimilar statement are often misinterpreted as evidence of inferiority by both health care providers and patients alike.[4] The fear of subpar efficacy along with crossover immunogenicity are major barriers to biosimilar uptake, as it prevents providers from prescribing biosimilars in the first place.[15] Furthermore, providers and patients lack confidence in using biosimilars for extrapolated rheumatic indications. Extrapolation of indication refers to the process whereby an approved biosimilar can use the originator's licensed indications with some limitations. These extrapolated indications have not been studied in a head-to-head clinical trial by biosimilar manufacturers.[15]

The Role of Pharmacists in Increasing Biosimilar Uptake in Rheumatology

Why Should Pharmacists Care about Increasing Adalimumab Biosimilar Use?

As 2023 fast approaches, at least eight biosimilars of the blockbuster drug Humira® (adalimumab) will be licensed and launched on the US market.[16] Hence, it is essential for stakeholders to strategize how to maximize the cost reduction associated with the biosimilar influx. It is well established that pharmacists are medication experts, so the onus is on the profession to ensure a smooth transition to implementing these complicated yet cost-saving medications. Although the introduction of these biosimilars is good news for patients and health systems alike, it will be an uphill battle because of the inevitable barriers posed by their entry to the market.

Proof of effective pharmacist intervention is another reason for pharmacists to be invested in increasing biosimilar uptake. A cross-sectional study was performed to assess information

and concerns among French patients treated with biosimilars for rheumatic inflammatory disease.[13] This study performed a multivariate analysis of 629 participants, and they found that adequate information was the independent factor associated with reduced fear of biosimilar use in patients.[13] The evidence supports that patient education, a strong domain of pharmacists, helps improve user perception of biosimilars.

How can Pharmacists from Various Practice Sites Unite to Increase Adalimumab Biosimilar Uptake?

Pharmacists are poised to be educators for other health care providers (HCPs), patients, and caregivers about these innovative adalimumab biosimilars across various practice sites (Figure 2). The goal of this educational campaign would be to promote the uptake of adalimumab and other biosimilars in treating rheumatic and other diseases.[17] Biosimilar education should focus on reviewing safety, efficacy, immunogenicity, and extrapolation from clinical studies.[17]

In a national survey aimed at understanding potential barriers to biosimilar use, 86% of providers identified education on evidence of switching studies and post-marketing data as a challenge.[18] Hence, targeting provider education would increase the likelihood that these cost-saving medications would be prescribed, and combat patient reluctance of switching to biosimilars.[13] As shown by the French Rheumatology Association, rheumatologists are uniquely positioned to predict if a patient is a good candidate for a biosimilar switch. This prediction can be made using the available clinical, efficacy, and economic data. Additionally, the rheumatologist's influence over a patient's decision to switch to biosimilar is evident in a survey reporting that 79% of 629 patients trust their rheumatologists as reliable information outlets.[13] To address this barrier, pharmacists can create biosimilar educational materials, policy, tool kits, etc. that educate patients and/or providers and may serve as continual education (CE) credits for HCPs.[17] A united effort in the pharmacy community will pay dividends by increasing the confidence and use of these biosimilars and combat the traditionally slow uptake to new formulations.[17,19]

FIGURE 2. Pharmacist's Role in Improving Access to Biosimilars in Various Practice Settings

Figure 2: A breakdown of different pharmaceutical practice sites, and their respective roles in improving biosimilar access

Furthermore, pharmacists can address the patients' and providers' lack of confidence with extrapolated indications. Frantzen et al discovered that 88 of every 100 patients of 629 respondents were not content with the principle of the indication extrapolation.[13] In a survey of 246 respondents, 48.5% of prescribers reported they will likely delay incorporating these biosimilars into practice until post-marketing data supports their efficacy in therapy.[20]

Given the patient and provider apprehension with extrapolated indications, the goal for the pharmacy community is to normalize the scientific principle behind extrapolated indication. This may be achieved by reminding prescribers, patients, and other stakeholders through various platforms that the extrapolation principle has been widely used for decades.[21] This extrapolation approach is often preferred by manufacturers because it does not require them to repeat costly and time-consuming clinical trials to ensure the safety and efficacy of the approved medication after a non-clinically relevant update to the medication or its manufacturing process.[22] Although these updates may alter the biologics from the initially approved formulation and structure, the changes are not clinically significant, and the medications are, nonetheless, still efficacious in the preapproved indications.[22] Additionally, the NOR-SWITCH study, a double-blinded, randomized non-inferiority phase IV trial, demonstrated the efficacy and safety of an infliximab biosimilar across an array of diseases compared to its originator.[22] Sharing medical literature and current biological manufacturing process may help ease the providers' reservations about using biosimilars for extrapolated indications.

Role of Specialty Pharmacists

Specialty pharmacists have an important role in increasing biosimilar use in rheumatology. These pharmacists assist in the delivery of these complex and expensive medications to patients by handling the maintenance of the cold chain distribution and dispensing biosimilars. Specialty pharmacists also play a key role in negotiating payors' contracts and ensuring patient safety and medication efficacy.[23] Hence, specialty pharmacists are well positioned to address the following issues:

- Nocebo effect associated with biosimilar switch
- Complex biosimilar switching process
- Monitoring of patient's adherence and medication efficacy
- Use of databases for pharmacovigilance and clinical efficacy monitoring

For instance, specialty pharmacists can address the nocebo effect by showing confidence and using positive language when communicating with patients before the switch to a biosimilar happens.[12]

TABLE 2. Randomized Controlled Trials (RCTs) and Open Label Extension Switch Studies

Authors	Product	Population	Study Design	Number Patients Switched	Follow-up	Efficacy, Safety, and Immunogenicity Outcomes	Conclusion
Cohen et al. (2017)[27]	Adalimumab – ABP 501	RA	Open-label extension study of a Phase III trial • Switch arm: change from adalimumab to ABP501 • Continue arm: stay on ABP501	237	46 weeks	• Similar percentages of subjects reaching ACR20 (specific numbers not provided) • Similar rates of TEAE (switch: 65.0%, continue: 62.4%, no statistics provided) • Similar percentages of subjects developing neutralizing antibodies at any time between two arms (switch: 13.9%, continue: 14.4%, no statistics provided)	Long-term safety, immunogenicity, and efficacy results were comparable between switch and continuing arms
Cohen et al. (2018)[28]	Adalimumab – BI695501	RA	Randomized double-blind, parallel arm, phase III trial (VOLTAIRE-RA)	147	34 weeks	• Percentages of patients with good response per EULAR grading between RP continued and switch were 35% and 31%, respectively. • Percentages of patients with moderate response per EULAR grading between RP continued and switch were 47% and 52%, respectively. • Percentages of patients with at least 1 drug-related AE between RP continued and switch were 22.9%, and 19.2%, respectively. • Immunogenicity was similar across arms (no statistics provided)	The switch had no impact on efficacy, safety, and immunogenicity
Hodge et al. (2017)[26]	Adalimumab – CHS-1420	PsO and PsA	Double-blind, randomized, parallel arm, phase III trial	124	8 weeks	PASI75 achieved in 84.6%, 81.6%, and 88.3% of patients in BS continued, switch, and RP continued arms. TEAE reported in 20.1%, 19.4%, and 16.3% pts in BS continued, switch, and RP continued arms.	Similar safety and efficacy between switched and nonswitched pts
Papp et al. (2017)[29]	Adalimumab – ABP 501	Ps	Randomized, double-blind, parallel arm, phase III trial	77	36 weeks	• No significant differences across arms in percentages of PASI50/75/90/100 at week 50 (RP continued: 94.3%/87.1%/64.3%/35.7%, and switch: 92.8%/81.2% /66.7%/34.8%) • Percentages of TEAE between RP continued and switch were 65.8%, and 70.1%, respectively. • Percentages of patients with binding antibodies at any time were comparable across arms (RP continued 74.4% and switch 72.7%)	Similar efficacy, safety, and immunogenicity profiles after single switch between arms
Weinblatt et al. (2018)[30]	Adalimumab – SB5	RA	Extension. Double-blind, randomized, controlled phase III trial	125	28 weeks	• ACR20/50/70 response rates at week 52 for the RP continued and switch arms were 73.4%/50.8%/28.2% and 78.8%/54.2%/26.3%, respectively. • AE rates for the RP continued and switch arms were 37.6% and 33.1%, respectively. • Incidence of overall antidrug antibodies for the RP continued and switch arms were 18.3% and 16.8%, respectively.	Switching had no treatment-emergent issues, such as increased AEs, increased immunogenicity, or loss of efficacy

ACR20: American College of Rheumatology; ADA: anti-drug antibodies; AE: adverse event; BS: biosimilar; EUCLAR: European Alliance of Associations for Rheumatology; PASI: Psoriasis Area and Severity Index; PsO: plaque psoriasis; PsA: psoriatic arthritis; RA: rheumatoid arthritis; RP: reference product; TEAE: treatment-emergent adverse event. Reported data and concluding remarks from randomized controlled trials (RCTs) and open label extension switch studies for Humira

Moreover, these pharmacists can help ensure that all HCPs on the patient's care team have consistent positive messaging about adalimumab biosimilars; a united front will potentially present the patients with less anxiety, skepticism, and confusion about the biosimilar.[12] Specialty pharmacists can also simplify the biosimilar switching process by creating a before-switching checklist.[12] This checklist would contain reminders and a timeline of crucial administrative tasks needed for a smooth transition by using a new patient support program (PSP).[12] These types of programs help improve access, usage, and adherence to patients' new medications.

Additionally, pharmacists can increase biosimilar uptake by addressing HCPs' reluctance to use biosimilars due to fear of cross immunogenicity and inferior efficacy.[15] The provider's reluctance to prescribe biosimilars to biologic naïve patients is evident in Gibofsky and McCabe's survey on the beliefs of US-based rheumatologists about biosimilars. The findings suggest that rheumatologists are reluctant to switch especially when patients are doing well.[24] Studies like the PLANETRA trial, a double-blind, randomized, multicenter, multinational prospective study with parallel group, found that there were no signals to suggest switching to biosimilars of infliximab caused increased anti-drug or neutralizing anti-drug antibodies.[22,25] Pharmacists can use the studies described in Table 2 to compile evidence-based answers and recommendations, which can assuage fears associated with biosimilar use. Ultimately, this can help to improve the providers' confidence in prescribing biosimilars to both originator naïve and non-naïve patients.[24]

Furthermore, specialty pharmacists can help monitor patients' adherence and medication efficacy. This can be accomplished by ensuring that billing data is reconciled with the patient's insurance claims and using the medication possession ratio (MPR) and proportion of days covered (PDC) to calculate a patient's adherence rates.[31] Specialty pharmacists can also monitor the biosimilars' longitudinal safety and efficacy profiles by using tools like the Visual Analogue Scale (VAS) to assess fatigue, pain, and quality of life, and the routine assessment of patient index data 3 (RAPID3) or Likert scale to optimize patient-oriented outcomes.[12]

TABLE 3. Proposed Tactics to Overcome Barriers to Biosimilar Adoption Towards Achieving BPCIA Goals, Adapted from Edgar et al.[18]

Biologic (brand name)	*Approved biosimilars*
Educational program about biosimilars	• Organize multi-stakeholder educational programs involving payers, providers, and patients » Provide education focused on biosimilar safety and efficacy, interchangeability, switching studies, and real-world evidence from post-marketing studies » Involve pharmacists in leading education on biosimilars » Leverage educational formats that facilitate peer-to-peer and team-based discussion of evidence and applications, such as grand rounds, small group sessions, and programs in specialty departments » Tailor education to providers in the community
Administrative processes for biosimilars	• Streamline prior authorization requirements to improve patient access to biosimilars and promote rapid reimbursement to providers who prescribe biosimilars • Increase communication with providers about biosimilar coverage criteria and cost savings from switching to biosimilars
Financial incentives	• Contribute to initiatives attempting to reduce cost sharing to patients receiving biosimilar and increase provider reimbursement for biosimilars through fee schedule adjustments • Relate the cost savings realized from switching to tangible benefits to providers » Benefits to physician practices may include hiring experienced staff or pharmacists or other investments

Tactics proposed to overcome obstacles preventing biosimilars from reaching goals set by the BPCIA.[13]

Additionally, because specialty pharmacists have access to real-world data, they can facilitate the design and maintenance of nationwide databases for biosimilar safety and efficacy. This can be done in collaboration with other pharmacists to ensure the optimal design and maintenance of a robust pharmacovigilance program.[18] The information and trends received from these databases can also serve as clinical evidence to provide information about the safety and efficacy of biosimilars to rheumatologists, other providers, and the public.[18,22]

Role of Informatics Pharmacists

The naming requirements for biosimilars are also considered a barrier to biosimilar uptake in rheumatology.[11,18,22,23] The required four-letter suffixes have been a source of concern for multiple stakeholders because they are often misperceived by both HCPs and patients as having a clinically meaningful difference.[23] At first glance, these suffixes might seem like an unnecessary logistical quagmire. As evident in the Kolbe et al US national survey of the understanding and willingness of physicians to prescribe biosimilars, 46% of the 507 specialty physicians thought that these suffixes were cumbersome.[20] However, these suffixes are especially important because adequate naming is a crucial part of any pharmacovigilance and adverse event reporting program, as well as billing and ordering in electronic medical records.[20]

Clinical informatics pharmacists are experts at using electronic health data to support the safe and effective use of medications. They are poised to aid in the simplification and demystification of the logistical issues surrounding the incorporation of these naming conventions into the electronic medical records, e-prescribing, computerized prescriber order entry (CPOE), and electronic medical records (EMR).[32] Additionally, informatics pharmacists can also aid in streamlining the prior authorization approval process in the EMR.[33] Furthermore, they can help integrate biosimilars into the rheumatology treatment pathways, protocols for switching and interchangeability, as well as listing the appropriate extrapolated indications.[19] As a result, informatics pharmacists can help simplify the biosimilar prescribing process, thereby reducing the reluctance of providers to prescribe biosimilars in rheumatic conditions, and by extension other disease

states.

Role of Community Pharmacists

Community pharmacists are known to be some of the most accessible health care professionals.[34] A cross-sectional study using International Business Machines (IBM) MarketScan claims data to compare rates of visits done by pharmacies and physicians (or other qualified health care professionals), found that beneficiaries visited the community pharmacy 1.5-2 times more often than they visited their physicians and qualified health care providers.[34] Due to the easy accessibility and high volume of community pharmacists, these front-line professionals must have a general understanding of biosimilars and rheumatology to assuage patients' fears and misconceptions about these life-preserving medications.[35] In addition, community or independent pharmacists can increase their revenue streams by creating biosimilar seminars or webinar services tailored to patient advocacy groups, such as rheumatology support groups.[21] Independent pharmacies in rural areas can create biosimilar medication services by partnering with specialty pharmacies and health systems to provide biosimilars to patients in rural areas. These services can include medication delivery to ensure the integrity of the cold chain, hosting video telehealth biosimilar medication monitoring visits, parenteral biosimilar administration, etc. These services will not only increase their revenue streams but can also ensure the optimal efficacy of these biosimilars through the maintenance of the cold chain distribution.

Role of Health System Pharmacists

Pharmacists working in a hospital or health system setting have an important role in improving biosimilar access in clinical practice given their interactions with several key stakeholders in the medication supply chain. At the health system level, pharmacists can promote the adoption of biosimilars into the formulary by using their clinical knowledge and extensive training in pharmacoeconomic and pharmacotherapy to highlight the benefits and cost-effectiveness of biosimilar adoption. The cost-effectiveness evidence collected and analyzed by a health system pharmacist should be shared not only with the health system's management but also with the pharmacy and therapeutics (P&T) committees, as well as contracting with insurance companies and other third-party payers.[33] As biosimilars are adopted into the formulary, health system pharmacists can further promote their clinical use by coordinating with other providers to develop evidence-based guidelines, emphasizing how providers can integrate biosimilars into daily practice while protecting patient safety and medication efficacy. Other strategies that could be initiated by pharmacists to promote biosimilar adoption are demonstrated in Table 3.[18]

Role of Managed Care Pharmacists

Cost is a major barrier to medication access in the category, especially specialty medications. Therefore, pharmacists working in a managed care setting are key in tackling hesitancy in biosimilar adoption, since they can directly influence the transition from biologics to biosimilars. To promote biosimilar adoption, pharmacists working at PBMs should be involved in negotiating with manufacturers to obtain the most cost-effective biosimilars for their patient populations and simplifying prior authorization and other administrative barriers that can delay or impede biosimilar uptake by providers.[17] Additionally, pharmacists can significantly alter how biosimilars are used via formulary management. Similarly, drug information pharmacists at PBMs can conduct comprehensive literature evaluation, analyze real-world evidence, and develop a favorable cost containment structure in favor of biosimilar uptake.[17] All these strategies will incentivize payers, providers, and patients to switch to or start with a biosimilar for certain disorders.

Role of Industry Pharmacists

Industry pharmacists are integrated into the drug development process and thus are well positioned to support biosimilar uptake. Pharmacists working in the clinical development and pharmacovigilance functional areas can support their organizations by ensuring that proper clinical trials are performed post-FDA approval to demonstrate the non-inferiority and immunogenicity safety profiles of biosimilars.[17] Regulatory affairs pharmacists have a strong background in literature evaluation and biopharmaceuticals and can take the lead in overlooking the biosimilar application review process.[17] Furthermore, medical affairs pharmacists can leverage their information dissemination machinery to communicate directly with key opinion leaders (KOL) to influence biosimilar uptake.

Conclusion

The exponential growth of biologics as disease-modifying agents in rheumatology presents new challenges to patients and the overall healthcare system. To combat rising costs without sacrificing the improved quality of life brought forth by biologics, the most logical solution is to use biosimilars. This is not a novel idea, as seen in its implementation in oncology medications; however, its use in rheumatology is minimal at best.[15] Evidence shows that pharmacists can be very impactful in improving biosimilar uptake through education of pertinent stakeholders, streamlining the prior authorization process, and demystifying misconceptions surrounding the suffixes attached to biosimilars, and the notion that biosimilars can cause increased immunogenic reactions.[11,36,37] It is important to note that there are limitations to what pharmacists can do to increase biosimilar use. Unlike generic substitution, pharmacists cannot directly substitute biosimilars for originators at the point of sale unless the biosimilar is an interchangeable product. The good news is that the FDA has approved Cyeltzo (adalimumab-adbm) as an interchangeable biosimilar for Humira®. But until policies surrounding biosimilars are changed, HCPs must work together to allay the fears and refute the misconceptions surrounding biosimilar use. For adalimumab biosimilars that will be released in 2023 and beyond, pharmacists must encourage other HCPs, patient advocacy groups, and government officials to become passionate and ardent advocates of biosimilars. This pharmacist-coordinated, multipronged approach will culminate in assuaging fears associated with the integration of these medications.

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Assessment Questions

1. **True or False**: While there are no FDA-approved biosimilars currently used in rheumatology, their use is expected to rise in the coming years.
   a. True
   b. False

2. In what way do biosimilars differ from generic medications?
   a. They don't; biosimilars are identical to generics.
   b. Generic medications demonstrate identical chemical structures to their branded counterpart, while biosimilars have more variability.
   c. Unlike generics, biosimilars can be marketed before the patent of the branded medication has expired.
   d. The differences between biosimilars and biologics can be clinically significant

3. **True or False**: Health system pharmacists play a critical role in improving biosimilar access, while contributions from pharmacists working in other settings is negligible.
   a. True
   b. False

4. How can a pharmacist in an interprofessional team facilitate biosimilar use?
   a. Serve as medication experts.
   b. Educate other healthcare professionals on the benefits of biosimilar adoption.
   c. Support the adoption of biosimilars directly via participating in P&T committee with other HCPs.
   d. All of the above

5. **True or False**: Biological agents for rheumatoid arthritis are often first-line treatments and do not require any additional prior authorization for patients.
   a. True
   b. False

6. **True or False**: Like the generic-brand relationship, biosimilars have identical chemical structures to reference products.
   a. True
   b. False

7. Which of the following is a challenge to the uptake of biosimilars?
   a. Nocebo effect
   b. Medication naming and labeling confusion
   c. Payor reimbursement
   d. All of the above

8. Which of the following is a reason pharmacists should care about increasing the use of biosimilar uptake regardless of practice site?
   a. They could help improve prescribers' and patients' confidence in biosimilar use.
   b. Pharmacists are not medication experts; moreover, it's not in the job description.
   c. They make money from using the more expensive reference biologicals, so it's a conflict of interest.
   d. The use of biological products has been and is continuing to decline.

9. **True or False:** A major barrier to biosimilars' use is higher immunogenicity rates compared to their reference biologic medications.
   a. True
   b. False

10. Did the activity meet the stated learning objectives? (if you answer no, please email sarahs@pswi.org to explain)
    a. Yes
    b. No

11. On a scale of 1 – 10 (1-no impact; 10-strong impact), please rate how this program will impact the medication therapy management outcomes or safety of your patients.

12. On a scale of 1 – 10 (1-did not enhance; 10-greatly enhanced), please rate how this program enhanced your competence in the clinical areas covered.

13. On a scale of 1 – 10 (1-did not help; 10-great help), please rate how this program helped to build your management and leadership skills.

14. How useful was the educational material?
    a. Very useful
    b. Somewhat useful
    c. Not useful

15. How effective were the learning methods used for this activity?
    a. Very effective
    b. Somewhat effective
    c. Not effective

16. Learning assessment questions were appropriate.
    a. Yes
    b. No

17. Were the authors free from bias?
    a. Yes
    b. No

18. If you answered "no" to question 17, please comment (email info@pswi.org).

19. Please indicate the amount of time it took you to read the article and complete the assessment questions.

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Navigating the Continuing Opioid Epidemic: Managing Acute Pain in Patients Taking Buprenorphine

by Alexandra Beckmann, PharmD

Question

How can health-system pharmacists take a proactive role in managing patients with opioid use disorder, specifically managing acute pain in patients taking buprenorphine?

Imagine that you are an acute care clinical pharmacist, managing patients on a general medical unit. You are rounding with the interdisciplinary healthcare team on a newly admitted patient. The 38-year-old female patient was in a motor vehicle accident and sustained multiple broken bones. The patient has a past medical history notable for opioid use disorder, for which the patient currently takes buprenorphine/naloxone 16 mg/4 mg sublingually once daily. The patient is in extreme pain, but the team is unsure of how to treat the patient's acute pain and looks to you for guidance. Given that the patient is taking buprenorphine/naloxone, what will you recommend for acute pain management?

In the late 1990s, opioid prescribing increased due to pharmaceutical companies reassuring the medical community that opioid analgesics were not addicting. Due to increased prescribing, it was not long before there was widespread misuse and abuse of both prescription and non-prescription opioids. With the increased misuse and abuse, opioid overdose deaths rose to epidemic proportions.[1] Since 1999, the number of drug overdose deaths in the United States have quadrupled. Between 1999 and 2019, nearly 500,000 people died from opioid overdoses.[2] In 2017, the U.S. Department of Health and Human Services declared a public health emergency to address the national opioid crisis. Under this public health emergency, a five-point opioid strategy was developed. The priorities for combatting this epidemic include improving access to prevention, treatment, and recovery support services; improving the availability and distribution of overdose-reversing drugs; strengthening public health data reporting and collection; supporting cutting-edge research on addiction and pain; and advancing the practice of pain management.[3]

It is estimated that opioid use disorder (OUD) affects over 16 million people worldwide, with over 2.1 million people affected in the United States.[4] One of the leading causes of preventable mortality in the United States is opioid-related overdose. From 2019 to 2020, the rate of drug overdose deaths involving synthetic opioids increased 56%.[5] The Wisconsin Department of Health Services (DHS) reported that, during the COVID-19 pandemic, the state's opioid epidemic has worsened.[6] After a steady increase in opioid overdose deaths before 2018, the deaths in Wisconsin had dropped by 10% to 839 that year. However, the numbers have increased since then, with 916 deaths in 2019 and 1,227 deaths in 2020. As opioid overdose deaths continue to rise in the state, the Wisconsin DHS has recommended multiple measures to continue to combat the opioid epidemic. These recommendations include continuing to train healthcare professionals on best practices for opioid prescribing and OUD treatment.[7] Pharmacists can play a key role by providing education to patients and recommendations to other healthcare providers, including recommendations for managing acute pain in patients with OUD.

The strong stigma associated with all substance use disorders creates a barrier between patients and healthcare providers. Some of those stigmas—inaccurate perceptions—include that people with

OUD are dangerous, are to blame for their condition, or are incapable of managing treatment and maintaining recovery. These perceptions are rooted in the antiquated idea that addiction is a moral failing. However, OUD is a chronic, treatable disease from which patients can recover. For healthcare providers, there should be a continual goal to address and change stigmatizing behavior (Table 1).[8] For situations where patients with OUD need inpatient acute pain management, both patients and providers might have concerns. For the patients, concerns may include: potential withdrawal symptoms, especially if usual maintenance medications are not given on schedule; fear that pain is not being taken seriously by healthcare providers leading to restricted access to proper analgesia; fear of discrimination, which can lead to distrust of healthcare providers; and fear of relapse if they are exposed to untreated pain or opioids. For the healthcare providers, concerns may include: a distrust of patients with OUD; over-treating pain; diversion of opioids prescribed at discharge; embellished pain scores to receive more opioids; and fear of patients leaving against medical advice without receiving full, crucial medical care.[9] It is crucial to continually address these concerns with patients and healthcare providers to provide the best care for the patients.[9]

In the inpatient setting, one challenge for healthcare providers is managing acute pain in patients with OUD who are using buprenorphine. Buprenorphine is widely used for the treatment of OUD and has complex pharmacology. It is a partial mu receptor agonist, a weak kappa receptor antagonist, and a delta receptor agonist. Due to its partial mu agonist property, when compared to full opioid agonists, buprenorphine's maximum analgesic effect is lessened. At higher doses, its analgesic effects plateau and can become antagonistic. With sublingual buprenorphine, a 16 mg dose occupies between 79% and 95% of the mu-opioid receptors. With sublingual doses greater than 24 mg, up to 95% of the mu-opioid receptors are occupied. Compared to other opioids, buprenorphine also has a higher mu receptor binding affinity and it displaces other opioids from the receptor site.[11,12] There are several FDA-approved buprenorphine formulations for the treatment of OUD (Table 2). Many of those oral formulations of buprenorphine contain naloxone, an opioid antagonist, to decrease the likelihood of intravenous or intranasal misuse of buprenorphine.[13] The oral bioavailability of naloxone is ≤2% and will not have an effect when given orally. However, if the medication is taken intravenously or intranasally, the naloxone will have an antagonistic effect on the buprenorphine. Due to the potency and complicated pharmacology of buprenorphine, the management of acute pain is challenging to navigate.[14] There are also several FDA-approved buprenorphine products for chronic pain management. However, in cases of acute pain management for patients being treated with buprenorphine for OUD, the utility of converting the patient to a buprenorphine formulation approved for pain management is limited due to the dosing of those formulations.

TABLE 1. Terms to Use and Avoid When Talking about Addiction[8,10]

Avoid	*Use Instead*
Addict, abuser	Person with an opioid use disorder
Abuse, misuse	Substance use Use other than prescribed
Clean	Being in remission or recovery Abstinent from drugs Not currently or actively using drugs
Dirty	Person who uses drugs
Relapse	Resumed substance use Recurrence of substance use
Medication-assisted treatment (MAT)	Opioid agonist therapy Pharmacotherapy Addiction medication Medication for a substance use disorder Medication for opioid use disorder (MOUD)

TABLE 2. Buprenorphine Products FDA-Approved for the Treatment of Opioid Use Disorder[15]

Generic Name	*Brand Name*	*Available Strengths*
Buprenorphine sublingual tablets	Subutex®	2 mg 8 mg
Buprenorphine/naloxone sublingual films	Suboxone®	2 mg/0.5 mg 4 mg/1 mg 8 mg/2 mg 12 mg/3 mg
Buprenorphine/naloxone sublingual tablets	Zubsolv®	0.7 mg/0.18 mg 1.4 mg/0.36 mg 2.9 mg/0.71 mg 5.7 mg/1.4 mg 8.6 mg/2.1 mg 11.4 mg/2.9 mg
Buprenorphine/naloxone buccal film	Bunavail®	2.1 mg/0.3 mg 4.2 mg/0.7 mg 6.3 mg/1 mg
Buprenorphine/naloxone implants	Probuphine®	74.2 mg
Buprenorphine extended-release injection	Sublocade®	100 mg/0.5 mL 300 mg/1/5 mL

Evidence-Based Answer

Given the misconceptions related to managing acute pain in this patient population, there is a risk of undertreating the pain. While there is a lack of consensus on the management of acute pain in patients treated with buprenorphine for OUD, there are several proposed strategies for acute pain management to consider in

this patient population.

The 2020 Focused Update to the American Society of Addiction Medicine National Practice Guideline for the Treatment of Opioid Use Disorder addresses the management of individuals with pain, and there is a specific section on buprenorphine and pain management.[16] Regarding perioperative pain management, prior to surgery, the discontinuation of buprenorphine is not required. In general, if pharmacologic therapy is needed for acute pain control, non-opioid analgesics should be considered first. However, the use of opioid analgesics should not be precluded by the presence or history of OUD. When needed, higher-potency full agonist opioids, such as hydromorphone or fentanyl, can be used for acute pain management. If possible, there should be coordination with the patient's OUD treatment provider to optimize acute pain control and to reduce the potential for relapse. For patients on buprenorphine maintenance therapy, there are several recommended strategies that can be considered:

1. Temporarily increase the total daily maintenance buprenorphine dose and/or divide the dose into three to four doses daily. The guidelines specifically mention that acute pain can often be adequately addressed by increasing the daily buprenorphine dose by 20% to 25% and splitting it into three to four doses.
2. For patients whose acute pain is refractory to other treatments and who require additional opioid-based analgesia, the addition of as-needed doses of buprenorphine may be considered. The addition of short-acting opioid analgesics to buprenorphine maintenance therapy may also provide benefit to controlling acute pain.
3. If buprenorphine maintenance therapy is discontinued during the treatment of severe acute pain, patients may need high doses of full opioid agonists to control pain. As the partial opioid agonist effects of buprenorphine dissipates, the effects of the full opioid agonists can lead to increased sedation and respiratory depression. Patients should be monitored closely.[16]

The Substance Abuse and Mental Health Services Administration (SAMHSA) Treatment Improvement Protocol (TIP) 63 addresses medications for OUD, with a section highlighting the medical management of patients taking OUD medications in hospital settings.[17] In general, for patients with acute pain, buprenorphine can be continued during hospitalization. For patients with mild-to-moderate pain, it is recommended to divide the patient's usual total daily maintenance buprenorphine dose into three doses to provide better pain control. For some patients, it may also be reasonable to increase the total daily buprenorphine dose to maintain adequate pain control. In patients with moderate-to-severe pain, the approach is more complicated, because additional analgesia, beyond an increase in the buprenorphine dose, is typically required. It is important to recognize that higher doses of opioids may be required to attain adequate pain control. There are two approaches to consider for these patients:

1. Use full agonist opioids for additional pain relief in addition to continuing the maintenance buprenorphine dose. Once the pain has improved, but the patient is still experiencing mild-to-moderate pain, the total daily maintenance buprenorphine dose can be divided into three doses.
2. Discontinue buprenorphine. To treat the acute pain and prevent withdrawal, use full opioid agonists. This strategy may be useful if the first approach does not attain adequate pain control.[17]

While the discontinuation of buprenorphine during a period of acute pain is a strategy that could be considered, in general, it is not necessary. There is a lack of evidence that continuation of buprenorphine therapy during acute pain management leads to poorer outcomes. One study showed that the continuation of buprenorphine during a perioperative period is associated with decreased outpatient opioid prescribing and decreased postoperative pain.[18] The discontinuation of buprenorphine while treating acute pain should only be considered as a last-line option due to the risks associated with it. The buprenorphine discontinuation increases the complexity of acute pain management and causes an increased burden on the patient, including the re-induction of buprenorphine. If the patient was treated with full opioid agonists for acute pain, the re-induction of buprenorphine will likely be physically painful and destabilizing for the patient due to the forced opioid withdrawal. There is also an increased risk for relapse because the patient will be in an opioid deficit while also being exposed to full agonist opioids.[19] By continuing buprenorphine, the patient's baseline opioid requirements are met, and it also allows for the use of short-acting full opioid agonists to manage acute pain.[20] Once the acute pain resolves, a plan to taper short-acting opioid agonists can be considered. However, it is important to consider the length of recovery from the procedure and the patient's recovery status when developing a taper plan.[21]

Conclusion

As with many aspects of medicine, there is not a single strategy for treating acute pain in patients taking buprenorphine. While multiple strategies can be considered when managing acute pain in patients who take buprenorphine for OUD, the most important factors to consider are what is best for the patient and keeping open communication with them about the pain management plan. As the opioid epidemic continues to ravish the country, there will continue to be a need for the use of pharmacotherapy in treating opioid use disorder. Buprenorphine remains a common treatment option, and there will be a continued need to understand how to manage acute pain in patients treated with buprenorphine. Open communication between the patient and providers is key when developing a plan to properly manage acute pain. By understanding the different options for managing acute pain in patients taking buprenorphine, pharmacists can play a key role in ensuring a smooth transition of care and assisting other healthcare providers in navigating this complicated situation.

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"MORTAR & PESTLE" CONCORDIA UNIVERSITY WISCONSIN SCHOOL OF PHARMACY STUDENT WRITING CLUB:

The Use of Sodium Glucose Co-transporter-2 Inhibitors in the Treatment of Heart Failure

by Dragana Vlaski, 2024 PharmD Candidate, Timothy H. Vogt, 2024 PharmD Candidate

Heart failure (HF) is a clinical manifestation showing functional impairment and anatomical changes of the heart resulting in inadequate filling or ejection of blood from the heart.[1] Symptoms arise over time as cardiac output declines, making it difficult for the heart to support the body's blood and oxygen needs. Congestive HF is a highly prevalent, chronic condition that affects a little more than 6 million patients in the United States. The number of people diagnosed with heart failure is increasing and projected to rise 46 percent by 2030.[2] As this condition can get worse if left untreated, it is imperative that patients remain adherent to medications and make any needed changes in diet, physical activity, and lifestyle to have the best quality of life possible.

Patients with HF are initially classified as having HF with reduced ejection fraction (HFrEF; EF ≤40%) or preserved ejection fraction (HFpEF; EF ≥50%).[3] Ejection fraction is a measurement of the percentage of blood the left ventricle pumps out with each contraction.[4] HFrEF is a type of heart failure where the heart muscle is weakened and is unable to pump enough blood to the rest of the body, while HFpEF is caused by the lowered filling of the ventricle and/or impaired relaxation of the ventricle.[5] The aim of treatment is to improve quality of life, lessen symptoms, and decrease the likelihood of disease progression.[6] Herein, we explain the classification and pathophysiology of HF, describe the beneficial role of sodium-glucose cotransporter-2 inhibitors (SGLT2i) in heart failure, and lastly, inform healthcare professionals about how to effectively educate patients on SGLT2i therapy when they are prescribed for HF.

TABLE 1. Stages of Heart Failure[6]

Stage	Structural Damage	Patient Factors	Recommended use of SGLT2i
A	At risk for HF No structural damage	Has HTN, CVD, DM, obesity, family history or genetic predisposition for cardiomyopathy	Add-on for primary prevention for patients with T2DM only
B	Pre-HF Evidence of structural damage	May not be symptomatic May have 1 of: evidence of increased filling pressures, structural disease, risk factors and increased BNP or troponin levels	Add-on to reduce the risk of exacerbation regardless of T2DM diagnosis and EF (only if the patient is symptomatic).
C	Symptomatic HF Structural damage with ongoing symptoms	Ongoing or previous symptoms. Ex: fatigue, pain, dyspnea	Start dapagliflozin or empagliflozin regardless of T2DM diagnosis and EF.
D	Advanced HF	Symptoms that impede daily life with repeated hospitalizations despite drug therapy management	Start dapagliflozin or empagliflozin regardless of T2DM diagnosis and EF.

CVD = cardiovascular disease; BNP = b-type natriuretic peptide; DM = diabetes mellitus HF = heart failure; HTN = hypertension; EF = ejection fraction; T2DM = type 2 diabetes mellitus;

Classification, Etiology, Risk Factors, & Primary Prevention

According to the 2022 AHA/ACC/HFSA Guideline, HF is defined by four stages (A–D) of varying development and worsening of the disease.[6] See Table 1 for details on staging criteria. Heart failure is further characterized using the New York Heart Association (NYHA) classification system for stages C (symptomatic HF) and D (advanced HF). This is a subjective assessment that may change over time, whereas the stage of heart failure a patient is in (A–D) can only progressively get worse. The NYHA classification is described by class (I-IV) in Table 2.[6]

To prevent progression of the disease, clinicians should focus on primary prevention and optimization of medication therapy. For instance, patients with hypertension and/or cardiovascular disease (CVD) should have antihypertensive medications, a healthy lifestyle maintaining adequate diet and exercise, and cholesterol management. Furthermore, if these patients have type 2 diabetes mellitus (T2DM) and have or are at risk of CVD, they should be started on SGLT2i therapy. Lastly, those with genetic cardiomyopathies or family history of an abnormality should receive genetic screening and counselling, while those who have been exposed to cardiotoxic agents should receive interdisciplinary assessment.[6]

The most common causes of HF include ischemic heart disease and myocardial infarction (MI), hypertension (HTN), and valvular heart disease.[6] In the United States, approximately 115 million people have hypertension, 100 million have obesity, 92 million have prediabetes, 26 million have diabetes, and 125 million have atherosclerotic cardiovascular disease, which are all known risk factors for developing HF.[6] Coronary artery disease is one of the major risk factors for HF because it damages the myocardium and may cause remodeling and scar formation, resulting in decreased cardiac output and contractility.[3] Furthermore, previous myocardial infarction

raises HF risk 10 times higher than in the normal population during the first year after the infarction and up to 20 times in following years.[7]

Pathophysiology

Heart failure is a complex condition that results in a lowered cardiac output unable to adequately profuse or fulfill the body's metabolic demands.[5,8] Cardiac output, generated primarily by heart rate and stroke volume (SV), is defined as the quantity of blood pumped by the heart over a given time. Stroke volume, which is the volume of blood ejected from the ventricle during each heartbeat, is influenced by preload, contractility, and afterload. Typically, all these factors work together to produce an efficient cardiac output, which results in a higher mean arterial pressure (MAP) and adequate perfusion of blood throughout the body. HF primarily results from dysfunction of the left or right ventricle. Dysfunction of the left ventricle can be further classified as diastolic or systolic dysfunction. Diastolic dysfunction is insufficient relaxation and filling of the ventricle, which results in an ejection fraction (EF) >40%, while systolic dysfunction is the impaired contraction of the ventricle, which has an EF <40%. Common symptoms of left ventricular dysfunction include symptoms of pulmonary congestion, like dyspnea and sputum-producing cough. Often, as the left ventricle fails, the right ventricle is also impaired, leading to increased pressure in the vena cava and right atrium due to increased amounts of blood in the right ventricle. This results in higher blood volume throughout the body and lower extremities, causing peripheral edema, jugular venous distention, hepatomegaly, and other symptoms.[8]

Following the loss of or injury to cardiac tissue induced by the aforementioned risk factors, HF manifests itself as structural, cellular, and neurohormonal changes to compensate for the anatomical dysfunction. These changes work synchronously, primarily through the Renin-angiotensin-aldosterone-system (RAAS) and sympatho-adrenergic systems, to maintain the functioning of the heart by retaining sodium and water to increase SV.[8] However, these compensatory mechanisms lead to ongoing deterioration of the cardio-renal system and increased peripheral vasoconstriction and volume overload.[5] For instance, the sympathetic nervous system releases catecholamines, activating β-1, β-2, and α-1 receptors, and increasing heart rate, contractility, and peripheral vasoconstriction. This continuous activation induces cardiac toxicity through high oxygen demand, prompting arrhythmias and lowered EF. In response to this activation and lowered EF, the kidneys secrete renin to further trigger the RAAS, which leads to additional dysfunction. This system causes sodium and water retention

TABLE 2. NYHA Functional Classification for Heart Failure[6]

NYHA Class I	No limitations in physical activity resulting from their HF
NYHA Class II	Comfortable at rest but have slight symptoms resulting from HF (dyspnea, fatigue, lightheadedness) with ordinary activity
NYHA Class III	Comfortable at rest but have symptoms of HF with less than ordinary activity
NYHA Class IV	Unable to carry out any physical activity without symptoms and have symptoms at rest

TABLE 3. Heart Failure with Reduced Ejection Fraction (HFrEF) Medication Education

HF Medication Class	*Benefit in HF*	*How Medication Works*	*Teaching Points*
Angiotensin receptor-Neprilysin Inhibitors (ARNi) **Sacubitril/valsartan (Entresto)** **Angiotensin-Converting Enzyme Inhibitors (ACEi)** Lisinopril Enalapril Captopril **Angiotensin Receptor Blockers (ARBs)** Candesartan Valsartan Losartan	↓ mortality ↓ hospitalizations ↑ quality of life	• ARNi specific: blocks neprilysin (protein) which breaks down important hormones known as natriuretic peptides. Natriuretic peptides regulate blood volume and vascular tone. ARNis also block angiotensin II type 1 receptor, preventing vasoconstriction and aldosterone release. • Reduces how hard the heart works. • Delay or slow progression of HF.	• ARNi specific: there should be at least 36 hours between ACEi and ARNi doses. • Will cause potassium levels to increase, avoid additional potassium in foods and salt substitutes. Kidney function and potassium levels will be checked regularly. • Will lower blood pressure, use caution when making rapid changes in posture. • ACEi specific: May cause a persistent, dry cough. • Rare adverse effects include angioedema (swelling around mouth or face).
Beta Blockers (BB) Metoprolol Succinate Carvedilol Bisoprolol	↓ mortality ↓ hospitalizations	• Decrease heart rate and workload of the heart. • Reverse remodeling process. • Improve strength and contractility of heart.	• Monitor for worsening symptoms of HF: fluid retention, fatigue, shortness of breath. • Will lower blood pressure, use caution when making rapid changes in posture. • May worsen wheezing in patients with reactive airway diseases. Monitor use of rescue therapies (ex: albuterol). • Fatigue may occur, but it is dose related and transient (4-6 weeks). • Patients with Diabetes should monitor blood glucose levels more closely, and the s/s of hypoglycemia may be masked.

TABLE 3. Heart Failure with Reduced Ejection Fraction (HFrEF) Medication Education (Cont.)

HF Medication Class	*Benefit in HF*	*How Medication Works*	*Teaching Points*
Aldosterone Antagonists Spironolactone Eplerenone	↓ mortality ↓ hospitalizations ↑ quality of life	• Blocks aldosterone stress hormone, leading to NaCl/ water excretion, while maintaining potassium levels.	• Will cause potassium levels to increase, avoid additional potassium in foods and salt substitutes. Kidney function and potassium levels will be checked regularly. • May cause some fluid loss; monitor for dehydration. • Spironolactone specific: May cause breast tissue swelling or breast tenderness in males.
Sodium-Glucose Cotransporter 2 Inhibitors (SGLT2i) Dapagliflozin Empagliflozin	↓ mortality ↓ hospitalizations ↑ quality of life	• Protects the heart and kidneys by decreasing excess fluid, improving BP. • May help with symptoms of HF, such as SOB or swollen ankles, feet and legs.	• Renal function, volume status, BP, and electrolytes (Mg, K, Phos) will be monitored periodically throughout treatment. • Will lower blood pressure, use caution when making rapid changes in posture – especially elderly and renal impairment. • Monitor for dehydration and dizziness. • Use proper hygiene and monitor for mycotic/UTI infections. • Rare but life threatening: too much acid in the blood/urine in T2D (DKA). Monitor for signs/symptoms of nausea/ vomiting, abdominal pain, SOB, malaise. Fournier's Gangrene - necrotizing fasciitis of the genitalia. **Other warnings/precautions:** • SGLT2i should be held at least 3 days prior to surgical procedures to avoid risk of ketoacidosis. • Use of SGLT2i is contraindicated in patients with diabetic ketoacidosis or patients with type 1 DM. • Not recommended for dialysis patients; do not use if eGFR<20 mL/min for Empagliflozin and <30 for dapagliflozin.
Loop Diuretics Furosemide Bumetanide Torsemide	↑ quality of life NO impact on mortality	• Reduce fluid in the lungs, abdomen, lower extremities, and other parts of the body. • Decrease in excess fluid decreases workload of the heart.	• Take medication early in the day, avoid taking at bedtime • Check weight daily and contact provider with significant weight gain. • Monitor for dehydration and dizziness. • Renal function, potassium, and magnesium levels will be checked regularly. • Limit salt intake to avoid additional fluid retention.
Hydralazine/Nitrates	↓ mortality* ↓ hospitalizations ↑ quality of life **Benefit in mortality is seen in African American patients and those intolerant to an ACEI or ARB*	• Relax blood vessels. • Increase supply of blood and oxygen to the heart. • Reduce the workload of the heart.	• Nitrates may initially cause a headache which is transient. Acetaminophen may be used to treat headaches. • Will lower blood pressure, use caution when making rapid changes in posture. • Avoid use of phosphodiesterase type 5 inhibitors with nitrates.
The following may be used as add-on therapy after other goal directed medical therapy (GDMT) has been optimized			
Ivabradine	↓ hospitalizations ↑ quality of life ↓ mortality	• Slows the heart rate by inhibiting the electrical current made by the heart's natural pacemaker (SA node).	• Heart rhythm will be monitored prior to initiation and with any dose adjustment as use increases the risk of Afib. • Take with food around the same time of day; avoid grapefruit/grapefruit juice. • Monitor for signs of high blood pressure like very bad headache or dizziness, passing out, or change in eyesight. • Monitor signs for slow or abnormal heartbeat, shortness of breath, vision changes, feeling dizzy, tired, or weak. • Contraindicated in patients with: acute decompensated HF; clinically significant hypotension (BP <90/50 mmHg) or bradycardia (HR <50 bpm); pacemaker dependence, severe hepatic impairment; concomitant use with strong CYP3A4 inhibitors.
Vericiguat	↓ hospitalizations ↑ quality of life ↓ mortality	• Increases levels of cyclic guanosine monophosphate (cGMP) leading to smooth muscle relaxation and vasodilation.	• Take this medication with food. • Common side effects include dizziness or passing out, feeling tired or weak. • Avoid use of phosphodiesterase type 5 inhibitors (ex: erectile dysfunction medications) while on vericiguat.
Digoxin	↓ hospitalizations ↑ quality of life NO impact on mortality	• Improves heart contractility. • Blocks stressful hormones.	• Digoxin levels will be monitored. • Signs of toxicity include: nausea, vomiting, blurred or colored vision, and abnormal heart rhythms. • Several drug interactions, ask the pharmacist to assess interactions.

and vasoconstriction. The continued activation of both neurohormonal systems eventually causes ventricle remodeling.[5,8]

Due to the constant failure and compensation stress, the ventricles' shape, size, and structure are altered. These changes manifest as chamber dilatation, the disarray of cardiac muscle, hypertrophy, and overall shape. This remodeling continues until it becomes antagonistic to heart function while furthering compensation processes and less effective pumping.[5,8]

As this cycle of poor pumping and compensation continues, cardiomyocytes alter intracellular calcium for positive inotropic effects and release natriuretic peptides ANP and BNP, along with other components, to counteract vasoconstriction and inhibit vasopressin release and the RAAS. The changes in intracellular calcium increase energy demand, impair relaxation, and cause pro-arrhythmic effects.[5,8]

Treatment for Heart Failure

In the last five years, leading changes have been made regarding heart failure treatment. The 2022 ACC/AHA guidelines for the diagnosis and treatment of HFrEF established 4 classes of medications as goal-directed medical therapy (GDMT): an angiotensin system blocker (ACE-inhibitor [ACEi] or angiotensin receptor blocker [ARB], or angiotensin receptor-neprilysin inhibitor [ARNI]); beta-blockers; mineralocorticoid receptor antagonists (MRA); and the new addition of SGLT2i drugs, specifically, dapagliflozin or empagliflozin.[6] The benefits of use and mechanisms of action of each of these classes along with additional therapy for HFrEF for symptom management are listed in Table 3. The 2022 ACC/AHA guidelines recommend the use of diuretics (as needed) and SGLT2i for the treatment of symptomatic HFpEF and HFmEF with an ejection fraction of 41-49% and ≥50%, respectively. These agents provide the same mechanistic benefits as mentioned for HFrEF. Weaker recommendations with moderate-quality evidence support the use of an ARNI, MRA, ACEi, and ARB as additional pharmacologic treatment options for these patients.

Use of SGLT2i in Heart Failure

Sodium glucose co-transporter-2 inhibitors were added as a class of heart failure medications that historically were only used for the treatment of T2DM. They function by inhibiting glucose reabsorption in the proximal tubule of the nephron and, thus, reducing plasma glucose levels.[9] However, cardiorenal benefits that have been observed from SGLT2i mechanisms that are independent of lowering glucose levels. For example, beneficial hemodynamic effects of an SGLT2i in heart failure patients result from reduced preload and plasma volume. In addition, newer SGLT2i mechanisms target pathways that focus on controlling inflammation, as current evidence suggests that chronic inflammation plays a key role in the development of HF.[10] Within this class of medications, empagliflozin and dapagliflozin are the only two agents approved for use in heart failure at this time.[6] A few large-scale, groundbreaking clinical trials have shown that SGLT2is have a positive impact on cardiovascular outcomes in heart failure patients, irrespective of diabetes presence. In November of 2020, the New England Journal of Medicine (NEJM) published a double-blind randomized placebo-controlled trial, titled Dapagliflozin and Prevention of Adverse Outcomes in Heart Failure (DAPA-HF), which studied the effects of dapagliflozin in patients with heart failure

TABLE 4. Comparison of the DAPA-HF, EMPEROR-Reduced, and EMPEROR-Preserved Trials[9,11,12]

	DAPA-HF (n=4,744)	*EMPEROR-Reduced (n=3,730)*	*EMPEROR-Preserved (n=5,988)*
Clinical Outcomes	Dapagliflozin 10 mg vs placebo	Empagliflozin 10 mg once daily vs placebo	Empagliflozin 10 mg once daily vs placebo
Primary Outcome	Composite of death from CV causes or worsening HF	Composite of CV death or hospitalization for worsening HF.	Composite outcome event (death from CV causes or hospitalization for HF).
Primary Outcome Results	HR, 0.74; 95% CI (0.65–0.85) P<0.001	HR, 0.75; 95% CI (0.65–0.86) P<0.001	HR, 0.79; 95% CI (0.69 to 0.90) P<0.001)
Median follow-up (mo)	18	16	26
Number Needed to Treat (NNT)	21 (95% CI, 15 to 38)	19 (95% CI, 13 to 37).	31 (95% CI, 20 to 69)
Inclusion Criteria*	Age of at least 18 years, an ejection fraction of 40% or less, and NYHA class II, III, or IV symptoms.	Age of at least 18 years, an ejection fraction of 40% or less, and (NYHA) class II, III, or IV symptoms.	Age of at least 18 years, an ejection fraction of >40%, and (NYHA) class II, III, or IV symptoms.
Exclusion Criteria*	(eGFR) <30 mL/min/1.73m2, type 1 diabetes, or systolic blood pressure of <95 to 100 mmHg.	(eGFR) <20 mL/min/1.73m2, type 1 diabetes, or systolic blood pressure of <95 to 100 mmHg.	See full list of exclusion criteria within the trial data
Conclusion	Patients who received dapagliflozin had a lower risk of worsening HF or death from CV causes.	Patients who received Empagliflozin had a lower risk of CV death or hospitalization for HF.	Empagliflozin reduced the risk of CV death or hospitalization for HF in patients with HF and a preserved ejection fraction.

** See full list of inclusion and exclusion criteria within the DAPA-HF, EMPEROR-Reduced, and EMPEROR-Preserved trials*
Abbreviations: HF = heart failure, CV = Cardiovascular

and reduced ejection fraction. Following the DAPA-HF trial, the empagliflozin trials that were also published in the NEJM included evidence in both HFrEF and HFpEF: the Empagliflozin Outcome trial in patients with chronic heart failure with reduced ejection fraction (EMPEROR-Reduced) and the Empagliflozin Outcome trial in patients with heart failure with a preserved ejection fraction (EMPEROR-Preserved). The results of DAPA-HF, EMPEROR-Reduced, and EMPEROR-Preserved were consistent among patients with or without diabetes at baseline.[9,11,12] Table 4 summarizes key findings from each trial.

The 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure now supports using SGLT2i in patients with symptomatic chronic HFrEF to reduce hospitalization and cardiovascular mortality with or without comorbid T2DM. The use of an SGLT2i may also be beneficial in patients with heart failure with midrange ejection fraction (HFmrEF) and heart failure with preserved ejection fraction (HFpEF).[6]

As of now, further research is being conducted to provide more data on the use of SGLT2i for patients living with heart failure with a preserved ejection fraction. More evidence to support the use of SGLT2i, specifically the addition of dapagliflozin, in patients with HFpEF is underway. These findings have extended the therapeutic use of dapagliflozin and empagliflozin beyond agents used for glycemic control in patients with T2DM. For individuals with T2DM and cardiovascular disease or those who are at a high risk of cardiovascular disease, the guidelines now recommend using SGLT2i as an add-on therapy in stage A for primary prevention. Additionally, SGLT2i can be used to reduce the risk of HF exacerbation in stage B HF patients. Patients with stages C and D heart failure can begin taking an SGLT2i at any time during their HF treatment. In stages B, C, and D, an SGLT2i can be used independently regardless of whether the patient has T2DM. Table 1 includes these recommendations.

Pharmacist Patient Education

When educating a heart failure patient, pharmacists should focus on the benefits of and reasons for taking the SGLT2i; how the patient should take it; potential adverse drug reactions (ADRs) to be aware of; and when the patient should return to the clinic for evaluation of therapy (Table 5). In addition to these points, the pharmacist should address any concerns brought up by the patient during the education and following visits. In addition, pharmacists should implement teach-back methods to ensure adequate education and emphasize the importance of lifestyle modifications along with any education on new medications.[6]

TABLE 5. SGLT2-Inhibitor Patient Education[13,14,15]

Benefits in HF Treatment	• Lower risk of CV death • Lower risk of all-cause mortality • Lower risk of hospitalization due to HF • Lower body weight • Lower BP
Dosing	• 10mg by mouth daily (FDA approved dosing for HF treatment for Dapagliflozin and Empagliflozin) • Commonly taken in the AM • No regard to food intake
Monitoring Parameters	• Volume status • Blood pressure • Blood glucose levels • Serum electrolytes • Renal function • HbA1c (if patient has T2DM)
Return to Clinic	• 2 weeks post-initiation
Common ADRs	• Increased urination • Urinary tract infections • Genital mycotic infections
Serious/Rare ADRs	• Ketoacidosis » Nausea/vomiting, excessive thirst, frequent urination, sweet-smelling breath, fatigue, confusion » More likely with ketogenic diets and acutely ill • Acute Kidney Injury » Low urine output, dizziness, tachycardia, dry mucous membranes, thirst • Fournier's Gangrene » Pain in genital/perianal area, subcutaneous crepitus odor, scrotal swelling, tachycardia, exudate from region, fever • Allergic reaction » Peeling/blistering skin, rash, swelling of face, tongue, lips, or airway, difficulty breathing
Avoidance of ADRs	• Increase personal hygiene, especially before/following intercourse • Avoid restraining from urinating • Report discomfort when urinating • Report discharge from genitals • Report fever • Report pelvic/abdominal pain • Consider suspending use during acute illness
Drug-Drug Interactions	• Insulin (caution: increased risk of hypoglycemia) • Insulin Secretagogues (caution: increased risk of hypoglycemia) • NSAIDs (caution: increased risk of Acute Kidney Injury)
Contraindications	• Dialysis patients • Patients with Type 1 diabetes

Conclusion

Heart failure is a complex disease state necessitating complex management to lower a patient's risk of heart failure exacerbation. Through lifestyle modifications and proper medication use, the addition of SGLT2i drugs to GDMT gives clinicians and patients another avenue to achieve control of heart failure signs/symptoms and comorbidities. The recently updated national guidelines for heart failure, coordinated by AHA/ACC/HSFA, are excellent resources to educate clinicians on the best recommendations and evidence for patient treatment. It is vital for pharmacists to stay up to date on current treatments to inform and educate patients and clinicians on the best choices of therapy and to achieve the best patient care possible.

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The Formulary: How Pharmacy Technicians Can Promote Health Equity in Medication Therapy Management

by Sarah G. Francis, MS, MBA, CPhT-Adv

Abstract

Health equity means that everyone should be as healthy as reasonably possible, which includes medication adherence and financial well-being. Medication adherence is affected when patients are not able to obtain medication due to financial barriers. Pharmacy technicians are responsible for many of the administrative tasks associated with medication therapy management (MTM). These tasks include generating a personal medication record (PMR) and billing for service. Pharmacy technicians can help reduce the financial burden on patients by identifying formulary medications and their associated tiers on a patient's PMR. This article outlines the tasks a pharmacy technician should complete to identify formulary drugs during MTM to help with patients' health equity.

According to the CDC, "health equity is achieved when every person has the opportunity to 'attain his or her full health potential' and no one is 'disadvantaged from achieving this potential because of social position or other socially determined circumstances.'"[1] Two domains of the social determinants of health include: 1) healthcare access and quality and 2) economic stability. An individual's limitations in these domains can have a direct impact on their use of pharmacy services and benefits and can negatively affect medication adherence.[2] Specifically, the Healthy People 2030 Access to Health Services Workgroup AHS-06 objective in the healthcare access and quality domain is to "reduce the proportion of people who can't get prescription medicines when they need them."[3] The United States Department of Health and Human Services (DHHS) recommends "addressing financial barriers" to patients' prescription access to improve medication adherence; nevertheless, these financial barriers are a direct result of the economic stability domain.[4,5]

All providers and community health workers, including pharmacists and certified pharmacy technicians, should be aiming for health equity in every patient encounter. By offering a medication therapy management (MTM) consultation to every eligible patient, pharmacy technicians can lay a foundation to achieve objective AHS-06.

Pharmacy Technicians and Medication Therapy Management

The role of the pharmacy technician in MTM is to schedule patients; complete a patient history and personal medication record (PMR); and to process insurance and billing.[6,7] The patient history typically includes personal and demographic information (e.g., name, date of birth, age, gender) and medical history (e.g., allergies, health conditions), and the PMR is a list of current medications and supplements (including strength, dosage, and frequency).[7] In an effort to improve the MTM process, ensure patient cost is favorable, and increase medication adherence, pharmacy technicians should be familiar with formularies.

Formularies

A formulary is a list of medications covered by a patient's prescription drug plan.[8,9] It lists medications covered by tiers or levels. These tiers describe the amount

of coverage provided by the insurance company and/or the co-pay or co-insurance amount expected from the patient.[8,9] Patients with financial constraints need to minimize the cost of their medication while still receiving appropriate drug therapy; in other words, these patients need to optimize their medication costs.

Knowledge, Skills, and Abilities

Cost optimization is important to guarantee equitable healthcare; therefore, pharmacy technicians should indicate the status of a patient's current medication in the patient's formulary prior to handing the records off to the pharmacist. To do this, a technician must know how to:[8-10]

1. **Locate a patient's formulary online or over the phone.** Many prescription drug insurance cards have a customer service number and/or website where a patient's formulary information may be obtained.
2. **Read and interpret a formulary.** Formularies include drug name, drug category, coverage, and tier. A pharmacy technician should be able to distinguish each of these items.
3. **Indicate whether a prescription drug is covered.** If a prescription drug is not covered by insurance, an alternative drug that is covered may be selected during medication reconciliation. For duplicate therapies, this allows the non-covered drug to be eliminated in the medication reconciliation.
4. **Determine the coverage tier if covered.** For patients with limited resources, the ability to select lower-cost drugs where appropriate would lessen the financial burden of medication costs. An appropriate generic, alternative therapy, or preferred brand drug could significantly reduce drug costs.
5. **Obtain a prior authorization form if the prescription drug is not covered.** For necessary medications that are not covered by insurance, a prior authorization should be completed to affirm medical necessity. Obtaining the form for non-covered drugs will help to fast-track the prior authorization process, which often takes between 24 and 96 hours. This 1- to 4-day turn-around could drastically affect medication adherence.

Conclusion

The five formulary skills that a technician should be familiar with will assist in reducing the financial burden of prescription drug costs; however, this is merely a starting point, because some insurance companies do not cover all strengths or NDCs of medications, may have a supply limit, or may have a step therapy requirement.[10] Health equity is a challenging goal that cannot be achieved in one fell swoop, but it will be done gradually. Consequently, the pharmacy technician's use of formularies in MTM is a solid first step in undertaking one objective of the social determinants of health.

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MEDICAL COLLEGE OF WISCONSIN SCHOOL OF PHARMACY STUDENT WRITING CLUB:

Psilocybin Implications for Future Depression Therapy

by Anas Abuzoor, 2023 PharmD Candidate, Mikayla Bell, 2023 PharmD Candidate, Ami Leigh Schmidt, 2023 PharmD Candidate, Mahadi Zraik, 2023 PharmD Candidate, Sochenda Pen, 2024 PharmD Candidate, Kevin Bozymski, PharmD, BCPS, BCPP

In 2020, more than 20 million adults and 4 million adolescents in the United States had at least one major depressive episode.[1] Depression is a common yet serious mood disorder that negatively affects the way an individual feels, thinks, and acts. Depression, or major depressive disorder, is diagnosed after an individual experiences a 2-week period of depressed mood or loses interest or pleasure in daily activities along with additional symptoms such as changes in weight or sleep, fatigue, psychomotor agitation, feelings of worthlessness or guilt, decreased concentration, or thoughts of death or suicide.[2] It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at home and work.

The American Psychiatry Association 2019 guidelines recommend psychotherapy as the first-line treatment for mild to moderate depression with supplementation from pharmacotherapy as needed for successful treatment.[3] Current Food & Drug Administration-approved pharmacotherapy for depression in adults includes tricyclic antidepressants, monoamine oxidase inhibitors, selective serotonin reuptake inhibitors (SSRI), selective serotonin/norepinephrine reuptake inhibitors, and other options with unique mechanisms (Table 1). Unfortunately, traditional antidepressants are often limited by adverse effects, efficacy for only a subset of patients with depression, and poor adherence. It is common for patients to trial several antidepressant medications before finding benefit with limited adverse effects. As many as 50% of patients receive only a partial response while an additional 30% may be treatment resistant.[4] Additionally, the onset of action for antidepressants ranges from 6 to 12 weeks which can be discouraging for patients who are eager for symptom relief; this often results in medications being discontinued before their full benefits would be seen.[5,6]

The variability in effectiveness of current antidepressant medications is rooted in the deficit of knowledge of the pathophysiology of depression with a multitude of theories available based upon current treatment options. The most common monoamine theory explains depression as resulting from lower synaptic concentration of serotonin, norepinephrine, and dopamine, as the use of reserpine (a monoamine-depleting agent) causes depression symptoms.[7] However, this theory does not explain the therapeutic lag associated with reuptake inhibitor antidepressants or how alternative depression pharmacotherapies act by other mechanisms. Other theories explore the possibility of changes in receptor density affecting neurotransmitter levels; downregulation of brain-derived neurotrophic factor (BDNF) which plays a role in synaptic plasticity and neuron survival; shrinkage of the hippocampus; and abnormalities in the hypothalamic-pituitary-adrenal (HPA) axis. Antidepressants reverse these effects after long-term treatment due to the chronic activation of monoamine receptors which induces BDNF production and downregulation of the HPA axis.[7] With limitations of current depression treatment practices, exploring alternative options is

TABLE 1. Select FDA-Approved Pharmacotherapies for Major Depressive Disorder in Adults[3]

Category	Drug Class	Generic Names
First-Generation	Tricyclic Antidepressants (TCAs)	Amitriptyline Doxepin Imipramine Nortriptyline
	Monoamine Oxidase Inhibitors (MAOIs)	Isocarboxazid Phenelzine Selegiline Tranylcypromine
Second-Generation	Atypical Antidepressants	Bupropion Mirtazapine
	Selective Serotonin Re-Uptake Inhibitors (SSRIs)	Citalopram Escitalopram Fluoxetine Paroxetine Sertraline
	N-methyl-D-aspartate (NMDA) Receptor Antagonist	Esketamine
	Selective Serotonin/Norepinephrine Re-uptake Inhibitors (SNRIs)	Desvenlafaxine Duloxetine Levomilnacipran Venlafaxine
	Serotonergic Modulators	Nefazodone Trazadone Vilazodone Vortioxetine

imperative. One exploratory option includes psychedelics like psilocybin which have garnered interest in the research community as a possible therapeutic alternative. The objective of this article is to review the proposed mechanism of action, evidence, and clinical applications of psilocybin for treatment-resistant depression.

Pharmacologic Basis for Psilocybin

Psilocybin is a natural product containing tryptamine derived from certain species of mushrooms.[8] Historically, it has been used as a hallucinogen to induce altered states of consciousness and provide euphoria. For this reason, it was classified as a Schedule I substance in 1970 under the Controlled Substances Act, meaning any use and research of psilocybin's mechanism of action and potential therapeutic use in mental health disorders was stringently regulated and almost impossible.[8] However, the difficulty in treating mental illness has led to a resurgent interest in psychedelic research during the past decade, including substances such as psilocybin, lysergic acid diethylamide (LSD), and ketamine for various mood disorders. This resurgence of interest in psychedelic research is targeting mental health disorders, and recent psilocybin research has examined use for treatment-resistant depression.[9]

Psilocybin is structurally related to serotonin and exerts effects on 5-HT2A receptors in the prefrontal cortex.[8] Specifically, it activates neurons within the prefrontal cortex leading to altered cortical signaling. Multiple studies have shown a reduction in amygdala activity and changes in functional connectivity via neuroimaging observations after the use of psilocybin in major depressive disorder (MDD) and healthy patients.[10] These neurons affect perception and preconceived assumptions, potentially allowing a person to adapt and develop new insights or outlooks. In comparison, traditional antidepressants modulate the serotonin balance whereas psilocybin may alter brain structure leading to the potential to tackle treatment-resistant mental health disorders.[8] Moreover, only a small amount of psilocybin is renally excreted when used; therefore, dose adjustments are not required for people with any renal impairment.[11]

Preliminary Clinical Research Findings

Although psilocybin has the potential to alter neurons positively and may be of use in mental health disorders, we still lack evidence for its safety and efficacy. A 2016 open-label feasibility study found that psilocybin reduced Quick Inventory of Depressive Symptomatology (QIDS) scores one week (mean QIDS difference −11.8, 95% CI: −9.15 - −14.35, p = 0.002) after treatment lasting until three months (mean QIDS difference −9.2, 95% CI: −5.69 - −12.71, p = 0.003) after treatment while producing only transient side effects such as headache, nausea, and anxiety.[12] At six months similar statistically significant reductions in QIDS scores were found.[13] Davis et al. studied the effects of psilocybin in MDD over a four-week period.[4] Twenty-four participants received 20 mg of psilocybin at their first visit and 30 mg of psilocybin at the second visit supplemented by psychotherapy. The primary outcome was the change in GRID-Hamilton Depression Rating Scale (GRID-HAMD) score from baseline to post-intervention week one and week four. Seventeen of twenty-four (71%) participants had an improvement of greater than 50% in their GRID-HAMD score at week one (Cohen d = 2.3; 95% CI: 1.5-3.1, p <0.001) and week four (Cohen d = 2.3; 95% CI: 1.5-3.1, p <0.001) while 13 of 24 (54%) met criteria for remission. A 12 month follow-up found these results persisted after the second dose at 12 months with remission rates of up to 75% without serious adverse events.[14] This study demonstrated a quick onset for relief of depression symptoms while also producing lasting effects that persisted weeks after receiving psilocybin.

A six-week phase two randomized control trial compared the safety and efficacy of psilocybin and escitalopram for longstanding, moderate-to-severe major depressive disorder.[15] The first group (n = 30) was given two 25 mg doses of psilocybin three weeks apart plus a daily placebo pill. The participants in the second group (n = 29) were given two separate doses of 1 mg of psilocybin three weeks apart plus daily escitalopram 20 mg. The primary clinical outcome of the trial was the change from baseline in scores on the Quick Inventory of Depressive Symptomatology-Self-Report (QIDS-SR-16) after six weeks. Scores range from 0 to 27 with higher scores indicating more severe depression. The mean (± standard deviation) change from baseline in the score on the QIDS-SR-16 at week 6 was −8.0 (±1.0) in the psilocybin group and −6.0 (±1.0) in the escitalopram group (95% CI: -5.0-0.9, p = 0.17). Furthermore, the secondary outcomes demonstrated that psilocybin had resulted in a higher response rate on the QIDS-SR-16 (70% response with psilocybin versus 48% response with escitalopram) and remission rate (57% remission with psilocybin versus 28% remission with escitalopram). The psilocybin group reported improvements in perceived intense emotion, feeling compassion and pleasure, and ability to cry.[15] The most common adverse event in the psilocybin group was headaches within 24 hours. The escitalopram group reported more adverse events such as dry mouth, sexual dysfunction, anxiety, drowsiness, and reduced emotional response. A limitation of the study is the brief duration of escitalopram treatment, due to its delayed therapeutic action on depression and inability to correct for confounders which prevented the authors from demonstrating significance in their secondary outcomes. Direct comparisons between psilocybin and FDA-approved treatments for depression are lacking; therefore, larger and longer studies are needed.

Impact on Patient Care and Barriers to Use

Considering the recent interest in psilocybin use, it is important for healthcare professionals to consider its impact in a healthcare setting. Unfortunately, psilocybin has many unanswered questions regarding its underlying pharmacology and toxicology due to its regulatory status. Per the Registry of Toxic Effects of Chemical Substances, psilocybin is assigned a value of 641 on a scale where higher values correspond to better safety profiles (as compared to nicotine with a value of 21 and aspirin with a value of 199).[16] While this registry was last updated in January 1997, recent studies in non-human models have supported both low physiological toxicity and low abuse liability.

Individuals with current psychosis or those at risk for psychotic disorders

are thought to be at an increased risk for prolonged psychiatric reactions and have been excluded from studies thus far.[17] The major risk of administering psilocybin is the potential for a psychologically overwhelming anxious, fearful, or confused response which may lead to potentially dangerous behavior in unmonitored settings. For this reason, patient preparation, session monitoring, and follow-up discussions are implemented to minimize the risk of these occurrences. Other patient populations excluded from current trials include those at an elevated risk of cardiovascular problems due to psilocybin's risk of inducing a moderate increase in blood pressure. Further reports have been made of transient post-session headaches; however, history of headaches has not been an exclusion from participation.

Psilocybin is only approved by the FDA for investigational use, with no insurance coverage or patient accessibility outside of clinical trials.[18] Not only is psilocybin access restricted for patients, but investigators must follow strict rules as well. Investigators must register with the Drug Enforcement Administration (DEA), submit research protocols, and follow strict guidelines for obtaining, storing, and administering psilocybin. Currently, there are only two companies producing psilocybin used in advanced clinical trials: COMPASS Pathways in the United Kingdom and the Usona Institute in Fitchburg, Wis.[19,20] In addition to the legal criteria above, it can also be difficult to obtain funding. From 2015 to 2020, there were nearly 550 grants awarded for psychedelic research.[21] Although psilocybin is a federally classified Schedule I substance, psilocybin has been decriminalized in several cities, beginning in May 2019 with Denver, Colorado.[22] In November 2020, Oregon became the first state to legalize the use of psilocybin for medical purposes.[23]

Future Directions & Conclusion

Research regarding psilocybin for treatment-resistant depression and other mental health disorders is gaining traction, with certain doses showing promise for affecting brain function and structure positively without causing significant adverse effects. However, future studies, funding, and legal guidance are needed to determine the relative risks and benefits of long-term psilocybin use for these indications. Pharmacists and other health care professionals should continue monitoring this growing area of research to determine psilocybin's appropriate place in therapy.

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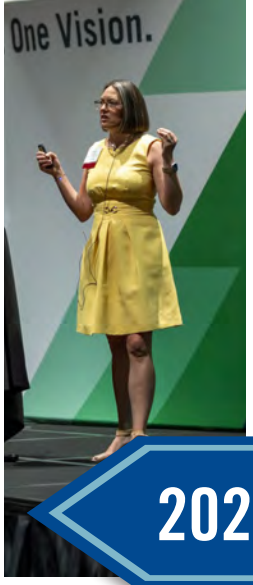

2022 PSW ANNUAL MEETING RECAP

2022 PSW ANNUAL MEETING

Navigating the Changing Tides of Healthcare

CONFERENCE RECAP

Thursday-Saturday, August 25-27, 2022
Kalahari Resort & Convention Center, Wisconsin Dells

55 EXHIBITORS

26 TOTAL SESSIONS
14 RECORDED CE SESSIONS AVAILABLE FOR HOMESTUDY AND 3 ON DEMAND SESSIONS

11 SPONSORS

200 PHARMACISTS

16 POSTERS

358 ATTENDEES
10 VIRTUAL

119 STUDENTS

29 TECHNICIANS

59,200 APP GAME POINTS!

20 HOURS OF PHARMACIST CE

15 HOURS OF TECHNICIAN CE

2022 PSW Annual Meeting Recap

by Miguel Mailig, 2023 PharmD Candidate

More than 350 pharmacists, technicians, and students gathered at the Kalahari Resort & Convention Center in Wisconsin Dells for the Pharmacy Society of Wisconsin (PSW) Annual Meeting in August, a testament to the strength of the profession and the dedication of its professionals. The attendees engaged in a three-day program August 25-27, centered around the theme "Navigating the Changing Tides of Healthcare." The 2022 meeting was conducted mostly in person, although a virtual-only option was available. Through the virtual option, attendees could view on-demand content and any in-person sessions that were recorded throughout the meeting (also available to in-person attendees) for continuing education credit. Topics included sepsis and renal dosing. Participation in the meeting was enhanced by the PSW app, which featured the program schedule, complete with speaker biographies and the slide deck for each presentation. A polling option in the app facilitated increased interaction between the speakers and their audiences in the form of check-in questions. The app also functioned as a social networking site, with functionality that let users connect with friends and colleagues and post on a public wall.

A welcome reception opened the conference on Thursday, allowing attendees to acquaint themselves with each other, as well as reconnect with old colleagues and friends. The program officially began on Friday morning with opening remarks from PSW's outgoing president, Ellina Seckel. Afterwards, Rima Afifi challenged existing definitions of the word "rural" and encouraged the audience to reflect on the socioeconomic disparities faced by residents in these areas that affect both their access to and outcomes in healthcare. She then offered actionable solutions that can be taken to help bridge this gap and how pharmacists can participate. Issues in rural healthcare were further discussed by a panel Featuring Ed Portillo, Michelle Farrell, and Scott Larson. Farrell and Larson reflected on their experiences as practitioners within rural communities, while Portillo drew from his experience as an educator to highlight how the next generation of pharmacists can tailor their practices to meet the increasingly recognized needs of rural patients. They also posited that the heightened importance of establishing pharmacist presence in the rural communities of Wisconsin is underscored by data showing that many Wisconsinites live in an area classified as rural, with community pharmacists being the most accessible healthcare professionals.

The forums were followed by an Exhibit Showcase, wherein more than 50 exhibitors shared information on their products, projects, and practices in keeping with the theme of the annual meeting. Simultaneously, a poster session was held that featured 17 projects completed by student pharmacists and practitioners in the advancement of pharmacy practice.

The rest of the afternoon was filled with forums and panels dealing with changing practices in both pharmacy and healthcare. Nicole Green led a discussion detailing her team's efforts to establish and legitimize an ambulatory care program at their practice site. They offered examples of patient cases that demonstrate the benefits of their program. Afterwards, Green participated in another ambulatory panel, "Billing/ Revenue & Expanding to New Patient Care Options," with Julie Bartell and Kate Hartkopf. Throughout the panel, the three practitioners described their experiences in leading an ambulatory care program, as well as the metrics they used, and challenges they faced to provide clinical and financial justification for their existence. Time was allotted for audience members to ask questions, which led to a fruitful exchange about the increasing recognition of pharmacists as crucial members of the care team across different practice sites, with one audience member even soliciting advice on how to handle increased demand for pharmacist services. Likewise, a session on "The Crucial Role of Pharmacists

"

I had the opportunity to interact with a first-time conference attendee during the Annual Meeting Welcome Reception. She had been encouraged by a colleague to attend and was intrigued by the rural perspectives we were presenting. But she was nervous. COVID staffing had kept her away from other professional conferences and she wasn't sure what to expect. I appreciated the chance to introduce her to a few people.

She recently reached out to me on LinkedIn and shared that the opportunity to be part of our PSW gathering had made an impact on her. She had visited with PSW staff and PSW President Janet Fritsch during a morning New Member Meet-up, getting a rundown of bite-sized engagement opportunities and how to use the PSW app. From there, she was able to use the connections she'd made to catalyze further connection. She now looks forward to future conferences and virtual member meet-ups where she will see some familiar faces.

- Sarah Sorum, Vice President & CEO, Pharmacy Society of Wisconsin

in Chronic Disease State Management: Lessons from the Field" highlighted the positive results in patient outcomes following pharmacist collaboration in the management of chronic diseases.

Other programming included a presentation by Jordan Wulz on the merits of using harm reduction strategies, instead of stigmatization, to handle the opioid crisis. Barry Gidal discussed the clinical uses and risks of cannabinoids, and student pharmacist Grace Nixon and pharmacist Magdalena Siodlak provided an update on the PSW's heart failure toolkit and demonstrated its use through a patient case. Sessions on "Improving the Patient Experience in Pediatric and Family-Oriented Vaccination Clinics" and "Getting on Board with the New ISMP Medication Safety Best Practices" rounded out the afternoon's programming. A night of festivities at the Kalahari Theme Park followed, where attendees were able to socialize.

Saturday morning began with a discussion on "Destination Workplaces: Finding Meaning in Your Work and Contributing to a Team that is on Fire for Patient Care." Carl Selvick and Andy Hillig described how a toxic workplace culture can lead to burnout and how individuals can take charge of finding meaning in their work, as well as contribute to a positive work culture. Jenny Arnold from the Washington State Pharmacy Association then provided insight on what practitioners in Wisconsin can expect as pharmacists are accorded provider status, with PSW Public Affairs Vice President Danielle Womack providing updates on where Wisconsin and PSW are in the process. It was then time for the PSW Membership Briefing & Presidential Remarks, during which PSW Executive Vice President and CEO Sarah Sorum shared some breakthrough initiatives PSW has been working on for its Plan 2026. These included technician licensing, and scope expansion for student pharmacists and pharmacy technicians. She also highlighted efforts undertaken by PSW in the area of diversity, equity, and inclusion (DE&I), the most notable of which was a $50,000 grant that recipients can use (a maximum of $20,000 can be granted per site) to invest in speakers, toolkits, and gap analyses, among other resources, to provide more equitable care for their patients. This was followed by Janet Frisch's installation as the new PSW

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president. In her first speech as president, Frisch reflected on her own journey and how she plans to use her lived experiences to provide service in her new position.

After a luncheon period where representatives of different schools of pharmacy in attendance shared a meal and reflected on their own experiences, the programming continued into the afternoon and covered topics ranging from culturally competent transgender patient care to pneumococcal vaccine updates and how to strengthen pharmacist-provider relationships. Drug literature was put in the spotlight as Amanda Margolis reviewed the uses and interpretations of non-inferiority trials, which she followed with a session on how to "Transform a Project into a Publishable Manuscript" with Michael Nagy. Equally important to interpreting and relaying information in the field of pharmacy is the management of misinformation. Jeffrey Fish spoke about how pharmacy professionals can equip themselves to handle misinformation in medicine, especially in the wake of the Covid-19 pandemic. Additional sessions that completed the afternoon's agenda included "Motivational Interviewing" and "Community Health Worker 101: Promotion of Future CHW Trainings." The last activity of the afternoon was the residency showcase, which allowed students to explore and introduce themselves to 24 different residency sites from across Wisconsin. The PSW Annual Meeting concluded with the President's Reception and Annual Banquet later that evening.

The 2022 PSW Annual Meeting built on the momentum created by last year's first in-person meeting following the Covid-19 pandemic. Its success has shown that pharmacists are not only able to navigate through the changing tides of healthcare, but are also well placed to play a leading role in facilitating this change.

Miguel Mailig is a 2023 Doctor of Pharmacy Candidate at University of Wisconsin-Madison School of Pharmacy in Madison, WI.

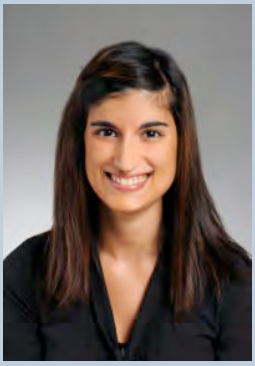
PSW Award Recipients

The 2022 PSW Award recipients were recognized at the 2022 PSW Annual Meeting Awards Banquet on Saturday, August 27, 2022.

Distinguished Service
Terry Maves, RPh
Retired Pharmacist

Pharmacist of the Year
Julie Thiel, PharmD
Winnebago Mental Health Institute and Wisconsin Resource Center, Winnebago

Bowl of Hygeia
Jeanine Krueger, RPh
Streu's Pharmacy
Green Bay



Young Pharmacist of the Year
Anita Kashyap, PharmD, BCACP
William S. Middleton Memorial VA Hospital, Madison

Excellence in Innovation
Thad Schumacher, PharmD
Fitchburg Family Pharmacy, Fitchburg

Curtis A. Johnson Award
Michael Nagy, PharmD
Assistant Professor, Medical College of Wisconsin School of Pharmacy, Milwaukee

Interdisciplinary Care Partner
Ann Lewandowski
The Janssen Pharmaceutical Companies of Johnson & Johnson

Pharmacy Technician of the Year
Staci Rush
Algoma Hometown Pharmacy, Algoma

Student Achievement Awards
Karina Rauenhorst (Concordia University Wisconsin)
Rawan Oudeh (Medical College of Wisconsin)
Tuyet Nguyen (University of Wisconsin-Madison)

WPQC Award Recipients

The 2022 WPQC Award recipients were recognized at the
2022 PSW Annual Meeting Awards Banquet on Saturday, August 27, 2022.

WPQC Engagement Award
Center Pharmacy

WPQC Innovation Award
Nicole Schreiner, Rachel Whitesitt, & Gabrielle M. Gaura
Streu's Pharmacy

WPQC Engagement Award
Altscripts Specialty Pharmacy

WPQC Innovation Award
David Schiek
Rhinelander Hometown Pharmacy

2022 PSW Fellowship Recipients

The PSW Fellowship Program (FPSW) exists to formally recognize PSW members who have demonstrated engagement with and sustained and substantive contribution to PSW. Candidates achieve this recognition through formal and informal leadership in PSW and advancing patient care and the practice of pharmacy in the state of Wisconsin in any practice setting. Fellows will be recognized annually at the PSW Annual Meeting.

Julie Bartel, PharmD
SSM Monroe Clinic, Monroe

Julie Dagam
Advocate Aurora Health

Inaugural Year: Past recipients of the PSW Distinguished Service Award

Below (left to right): *2022 PSW Fellowship Recipients Julie Dagam and Julie Bartell. Past recipients of the PSW Distinguished Service Award, Susan Kleppin, Dave Zilz, and Jay Rice.*

Spotlight

Leadership Spotlight: Dr. Hannet Ambord

by Ziting Zhang, 2023 PharmD Candidate

Hannet Tibagwa Ambord, PharmD, is the director of pharmacy services at Reedsburg Area Medical Center (RAMC) in Reedsburg, Wis. Ambord was recently elected President of the Pharmacy Society of Wisconsin (PSW) and will serve a three-year term with PSW. She received her PharmD degree from Northeastern University. Ambord completed her PGY1 at Fairview University Medical Center, then PGY2 at the University of Wisconsin Hospital and Clinics (UWHC) with a focus on health-systems pharmacy administration. In 2012, she completed an executive MBA at UW-Madison. Ambord has always been passionate about expanding pharmacy services and improving patient care outcomes. At UWHC, she served as an ambulatory care pharmacy manager for 11 years, then transitioned to UW Health Digestive Health Center as the clinic director for 3.5 years.

Ambord has been in her current position at RAMC for 6.5 years. She oversees hospital, clinic, long-term care, specialty, and retail pharmacy operations. Ambord works with third-party insurers and pharmacy benefit managers (PBMs) to develop drug policies at RAMC. In her role, she constantly seeks growth opportunities for pharmacy practice. With the philosophy of "break it to fix it," Ambord successfully implemented inpatient and outpatient pharmacy services, a meds-to-bed program, hospital and community residency programs, and the 340B program at RAMC. She expanded the medication compliance packaging and synchronization programs to improve each patient's understanding of and convenience for medication use.

Today's Concerns

Among many concerns, Ambord says discriminatory reimbursement in the 340B drug-pricing program is at the top of her list. Third-party payers and PBMs lower reimbursement rates for 340B providers compared to non-340B participants. This discriminatory reimbursement practice attacks the healthcare safety net as rural pharmacies and community healthcare centers receive less financial support to provide much-needed patient care. Ambord plans to collaborate with other pharmacies, along with PSW, to discuss and develop solutions for the prevention of discriminatory reimbursement.

Future Advice

Ambord urges student pharmacists and practicing pharmacists to get involved and not be afraid to fail. "Make sure you know and understand your value, along with what you bring to the table." She acknowledges that it is easier to sit on the sidelines. "You must unleash the innovator within to make a difference, speak up and take action." Additionally, from experience, Ambord says it is important to seek mentorship and build a cohesive team around you. Finally, she says, take the time to appreciate, understand and advocate for your team; it will make it easier to achieve your goals.

Ziting Zhang is a 2023 Doctor of Pharmacy Candiate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI.

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