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The Journal

of the Pharmacy Society of Wisconsin

Epidemics

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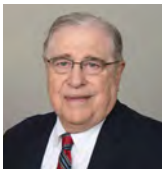
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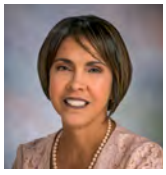
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The Bowl of Hygeia award program was originally developed by the A. H. Robins Company to recognize pharmacists across the nation for outstanding service to their communities. Selected through their respective professional pharmacy associations, each of these dedicated individuals has made uniquely personal contributions to a strong, healthy community. We offer our congratulations and thanks for their high example. The American Pharmacists Association Foundation, the National Alliance of State Pharmacy Associations and the state pharmacy associations have assumed responsibility for continuing this prestigious recognition program. All former recipients are encouraged to maintain their linkage to the Bowl of Hygeia by emailing current contact information to awards@naspa.us. The Bowl of Hygeia is on display in the APhA History Hall located in Washington, DC.

Boehringer Ingelheim is proud to be the Premier Supporter of the Bowl of Hygeia program.

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of the Pharmacy Society of Wisconsin

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Up Front: Building Our Tomorrow with the Wisconsin Pharmacy Foundation

by Chris Decker, RPh

The Wisconsin Pharmacy Foundation, or the Pharmacy Society of Wisconsin (PSW) Foundation, is a non-profit, tax-exempt organization that supports and pursues professional education and research programs to advance the science and practice of pharmacy. Working in coordination with PSW, the Foundation supports unique educational opportunities and leadership development for Wisconsin pharmacists and student pharmacists and pursues practice-based research projects. The Foundation also pursues fundraising efforts through gifts from PSW members, research grants, and other charitable gifts to enable PSW to contract for services and pursue its programs.

This Wisconsin Pharmacy Foundation has not always been as active. Shortly after starting my position with the then Wisconsin Pharmacists Association (WPhA) in 1990, I was working late and poking around the office. Imagine my surprise when I found that WPhA had a safe. Not just any safe; this was one of those large, old, very heavy safes that led the observer to believe there must be a great deal of value behind the door. As I sifted through old documents and bank statements, I found an old bankbook (remember those?!) that belonged to the Foundation. The bankbook detailed that the foundation had $10,000 in their account. A remarkable find given neither I nor any of our Board members at the time even new that WPhA had a Foundation!

The discovery of this Foundation seed would later give rise to an exciting Building for the Future campaign held in conjunction with PSW building a new home at 701 Heartland Trail to support the organization's One Voice. One Vision. With the leadership of several visionaries, the Foundation grew through generous contributions and now, after years of stewardship has a fund balance of more than $1,000,000.

Now, the Foundation is in active partnership with PSW to

support initiatives, promote leadership, and provide educational opportunities within the organization and beyond. We are building an efficient workplace to bring together members in pursuit of something bigger and better, connecting all sectors of pharmacy practice in Wisconsin through PSW. We are investing in new technology, including state-of-the-art video conferencing to enable members to interact with one another more than ever. A strategic investment decision made by the PSW Board of Directors and the Foundation.

The Foundation is responsible for supporting the Leadership Pharmacy Conference every year. The Leadership Pharmacy Conference, a new practitioner leadership conference, combines professional and social functions over three days and provides an unequaled opportunity for pharmacists relatively new to their profession to develop skills which enable both personal and professional growth. Participants network with fellow selected pharmacists (10 from Wisconsin and 10 from Iowa) as well as the presidential officers and staff leaders of the Iowa Pharmacy Association and Pharmacy Society of Wisconsin while engaging in programming, recreational activities, and professional discussions.

In addition to the leadership conference, the Foundation receives research and practice-based grants that are then used to fund PSW projects. For example, the Foundation received two large grants in 2018. The Expanding Immunization Access in Wisconsin grant was awarded through the Advancing a Healthier Wisconsin (AHW) Endowment to the Wisconsin Pharmacy Foundation in partnership with the Medical College of Wisconsin (MCW) to expand immunization access across Wisconsin. The other grant the Foundation received was the Community Management of Medication Complexity (CCMC) grant from the Center for Health Care Strategies, funded by the Gordon and Betty Moore Foundation. This work aims to address barriers to Medication Therapy Management Services provision in order to help low-income patients reduce medication complexity and safely self-manage their medication regimens. While the grant funding was provided to the Foundation these projects are managed by the PSW staff and partners.

Now, as PSW celebrates 20 years, the Foundation has embarked on a new campaign to raise funds to continue to advance the goals of the Foundation. The "Building our Tomorrow" campaign recognizes the donors from 20 years ago while looking to the future by continuing to support the important initiatives of PSW and Wisconsin pharmacy. The donors from the original campaign and this new campaign will be recognized on the "new" donor wall in conjunction with the PSW building remodel. This will serve as a thank you to those before who provided PSW the foundation, our building, on which to start the amazing work that we have accomplished and will continue to accomplish with the donations of the current campaign. A grand opening of the updated PSW building will occur in June of 2019.

The Wisconsin Pharmacy Foundation has taught us, that from the dust of forgotten bankbooks, one can rise to become a successful organization. At PSW, we strive for success and we are blessed with members, volunteer leaders, and staff who both uphold and demonstrate the Foundation's values.

Chris Decker is the Executive Vice President & CEO of the Pharmacy Society of Wisconsin in Madison, WI.

Ways to Donate to the "Building Our Tomorrow" Campaign

Donate Online: **www.pswi.org/Building-Our-Tomorrow**
Call the PSW office at 608-827-9200

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Wisconsin Pharmacies Going GREEN

Skipping the Bag: Madison VA Finds Creative Way to Reduce Plastic Use

Contributed by: Nate Menninga, Clinical Pharmacy Specialist

The increasing problem of plastic pollution in our world was highlighted during the 2018 Earth Day Expo at the Madison VA. This launched an evaluation of our facility's use of plastic, which resulted in a bulletin outlining four easy ways to use less plastic at work. Three of them highlighted areas we are all familiar with: using reusable water bottles, keeping dinnerware at work, and using reusable bags or skipping the bag altogether at the facility's store. A more out-of-the-box idea requiring collaboration across all departments within our facility was to reduce the number of trash bins kept in workspaces with the goal of reducing the 1.2 million plastic trash liners used each year by 5%. For example, instead of having four trash bins for four desks in a single room, there would be only one trash bin in a central location. It was estimated that this would result in $3000 of savings annually and allow our Environmental Services department to save two hours emptying trash bins daily. It has also had the added benefit of forcing us all to get up out of our chairs and meet our daily step goals!

GHS Environmentally Friendly Shippers

Contributed by: Loren Carrell

Gundersen Health System has been committed to decreasing waste and diminishing our carbon footprint for years. Over the past decade we have invested in multiple renewable energy sources such as wind farms and solar panels. We also built a biomass boiler, which converts natural gasses such as methane into steam at a very high rate of efficiency. With these investments, Gundersen became the first health system to become energy independent and has remained off the grid since October 2014.

Two years ago, as the pharmacy was reviewing validated shipping containers, our supply-chain department notified us of a company called GreenCell. They manufacture shipping containers made from corn that are biodegradable and environmentally friendly. This allows our pharmacies to avoid using Styrofoam, which lasts forever in landfills when discarded. Given our system's focus on conservancy, we brought them in for validation. The results have showed the products are stable past 24 hours and we have had several patients comment on the convenience of not having to ship the containers back to us.

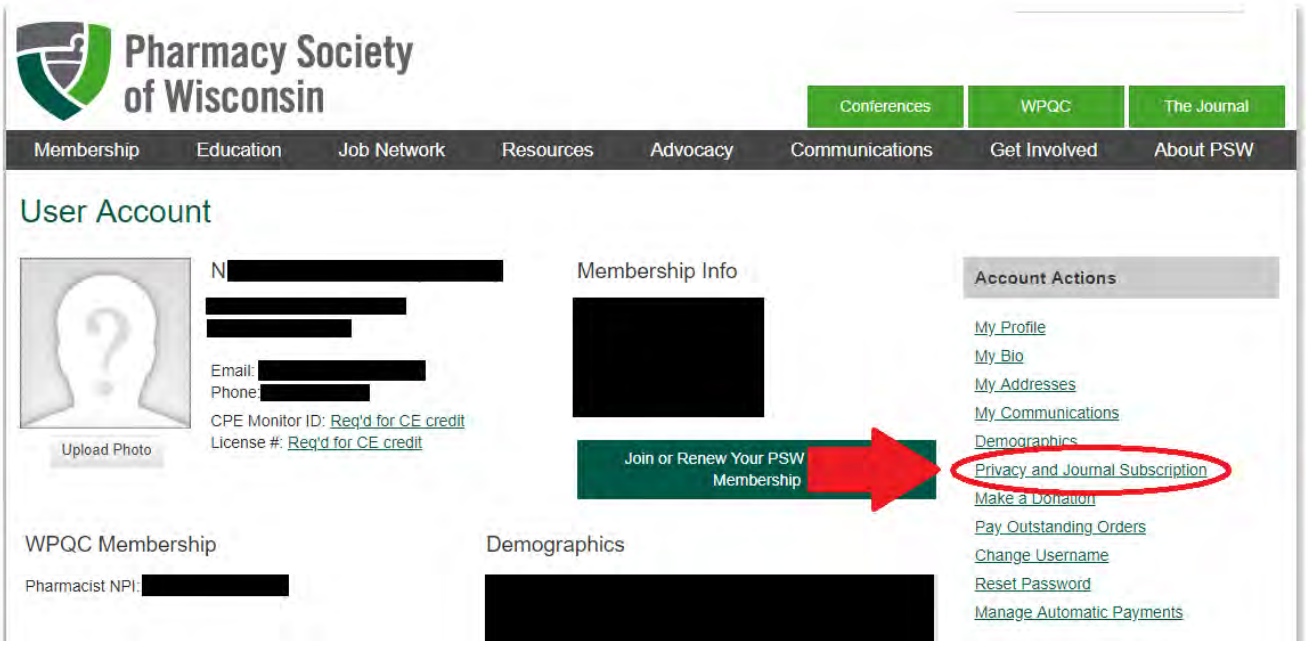
I would encourage other pharmacies to investigate this option but would share a couple tips. First, make sure that you do your own studies with them. There is a specific way container need to be packed and it helps ensure your pharmaceuticals are being shipped appropriately. Second, I would include handouts with the packages and communicate with your patients if you make the change. Early on we had a few that didn't realize the foam dissolves in water and were concerned that throwing them away would cause more waste in the environment.

Overall, the experience with these shippers has been a great opportunity for the Gundersen Pharmacy Department to help contribute to our organization's focus on waste reduction and use of renewable resources.

JPSW is Going GREEN

by Megan Grant, Nick Friedlander, 2020 PharmD Candidate, Amanda Margolis PharmD, MS, BCACP

The Journal of the Pharmacy Society of Wisconsin has decided to make one issue a year the GREEN issue. As you read on the adjacent page, many pharmacies are doing their part to make a positive impact on our planet. We are doing our part to save a few trees and continue their great work to reduce our environmental footprint. The March/April issue of *JPSW* will be the green issue every year. Interested in going all green? You can opt out of the mailed version of T*he Journal* in your PSW account. Go to pswi.org and login to your online account. In your user account under "Account Actions" on the right hand side of the screen, choose the "privacy and Journal Subscription" link. On the next page, un-click the option to "include me in the physical mailing of *The Journal*. This will take you off the mailing list. You can always access the PDF and digital version of *The Journal* on the Journal archive page on our website.



PHARMACIST CE:

The Pharmacists Role in Combating Statewide Epidemics

by Cody J Wenthur, PharmD, PhD, Laurel Legenza, PharmD, MS, Nicole Weinfurter, 2019 PharmD Candidate, Ashley Lorenzen, PharmD, BCPS, Dean Bowen, 2020 PharmD Candidate

CE FOR **PHARMACISTS**

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

Learning Objectives

- Summarize the CDC's definition of an epidemic
- Describe the impact of the opioid, *Clostridium difficile* infection (CDI), and obesity epidemic in Wisconsin and the United States
- Identify tools and education pearls to provide patients related to epidemics affecting Wisconsin residents
- Recommend evidence-based treatments to help combat each the opioid, *Clostridium difficile* infection (CDI), and obesity epidemic.

The word "epidemic" carries a lot of weight. It is a word that can instill fear and a sense of urgency in a population. It ultimately means there is a serious issue that is negatively affecting a high proportion of that population and needs to be addressed immediately. The Centers for Disease Control and Prevention (CDC) defines an epidemic as, "an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area."[1] The CDC has also quantified an "epidemic threshold" for pneumonia and influenza deaths that could be applied to other healthcare issues.[2] The "epidemic threshold" is met when there is an increase of 1.645 standard deviations above the seasonal baseline of pneumonia and influenza deaths.[2]

The United States (US) has dealt with various epidemics in the past. Examples of diseases causing epidemics which have been eradicated include polio, with the last case in the US occurring in 1978, and smallpox, which was eradicated from North America in 1952.[3,4] Currently in Wisconsin and the US, there are a number of epidemics affecting vast amounts of people. Three examples were pharmacists have the opportunity to get involved and assist with epidemic mitigation include opioid misuse, *Clostridium difficile* (*C. diff*), and obesity. Pharmacists are very accessible healthcare providers and may see patients up to a monthly basis. Pharmacists can recommend optimal antibiotic and pain management therapy, educate patients on how to use their medications properly, and provide diet and lifestyle interventions. The objective of this article is to describe the scope of each epidemic, how pharmacists can play a role in mitigating the epidemic, and present tools that pharmacists can recommend or use.

Background and Epidemiology of the Opioid Misuse Epidemic

Balancing the risks and benefits of opiate receptor agonists as analgesics has been a challenge in pain management for thousands of years, beginning with the use of products derived from the opium poppy, papaver somniferum.[5] As modern medicine promoted the increased availability and rapid expansion of semi-synthetic opioids, the need for proper management of this risk-benefit profile has likewise expanded to cover hundreds of millions of acute and chronic pain patients worldwide.[6] This growth has been especially dramatic in the US.[7,8] Opioid prescribing rates in the US peaked in 2012, with a rate of 81.3 prescriptions written for every 100 individuals. Although rates have recently declined, Wisconsin remains above the national average with 62.2 opioid prescriptions written per 100

individuals.[9] Although the expansion of access to appropriate pain control is a desirable public health outcome overall, the specific increase in opioid pain reliever utilization as a means to this end has unfortunately been a major driving force in the continuation of a general drug overdose epidemic and resurgence of broader opioid misuse.[10,11] Indeed, the magnitude of the problem has increased to the point where the US Department of Health and Human Services declared the opioid crisis to be a public health emergency.[12] In 2016, there were about 63,600 deaths nationwide due to drug overdose – a more than four-fold increase since 1999.[13] Within Wisconsin, there were approximately 20,600 individuals diagnosed with opioid use disorder (OUD) and 827 deaths due to opioid-associated overdose in 2016.[14] This corresponds to a rate of approximately 20 opioid overdose deaths per 100,000 people; drug overdose accounted for 15.5% percent of deaths amongst individuals 18-25 and 7.1% of deaths in 26-64 year old individuals in 2015.[15]

In response to the opioid crisis, the US government issued the Comprehensive Addiction and Recovery Act (CARA) in 2016, which was the first major legislation to address substance use disorder in over forty years.[16] This act contained measures to respond to the opioid overdose crisis across six distinct areas: law enforcement, criminal justice reform, prevention, treatment, recovery, and overdose reversal. The Heroin, Opiate, Prevention and Education (HOPE) agenda was instituted in Wisconsin in 2013 to address many of these same concerns, and expansion on this agenda through a dedicated task force and special legislative session has resulted in 28 enacted pieces of legislation to date.[17] Several of these laws directly impact the daily practice of pharmacy in the state, including a requirement to view and record identifying information from patients picking up a schedule II or III drug, a requirement to have a prescription for codeine cough syrup, and implementation of a statewide standing order for naloxone pharmacist dispensing.[18-21] Other laws have an indirect impact on pharmacist counselling and referral strategies, such as those expanding good Samaritan coverage and legal protections for individuals reporting or experiencing opioid overdose, and those funding additional medically assisted treatment (MAT) centers in underserved areas.[22-24]

TABLE 1. Risk Factors for Opioid Overdose

Medication-Related Factors	*Patient-Related Factors*
Combining opioids and benzodiazepines	Age ≥ 65 years
Daily dose ≥ 100 morphine mg equivalents	Sleep-disordered breathing
Long-acting or extended release opioid formulation	Renal or hepatic impairment
Long term opioid use for ≥ 3 months	Major depressive disorder
≤ 2 weeks since initiating long-acting opioid formulation	Substance use disorder
	History of drug overdose

Role of Pharmacists in Reversing the Opioid Misuse Epidemic

As the primary point of care for medication therapy expertise, pharmacists are optimally positioned to take advantage of these tools and help end the opioid misuse epidemic. At a broad level, the CDC identify a four-fold role for pharmacists in vigilance for signs of opioid misuse: assessment, verification, consultation, and communication.[25] Assessment is focused on identifying red flags associated with misuse, such as forged or altered prescriptions and inconsistent or early refills. Verification is used to validate proper therapeutic use, check prescriptive authority through the Drug Enforcement Administration (DEA), and confirm proper patient identification. Consultation with available patient records and prescribing databases is then recommended to identify possible misuse. Finally, communication with the patient and prescriber and submission of relevant information to the written record should be incorporated in order to allow for ongoing monitoring and risk-assessment by all parties.

However, individual pharmacists are ultimately responsible for applying these general vigilance roles in a way that leads to meaningful improvements in patient outcomes. Fortunately, multiple tools are available to support both preemptive opioid misuse risk reduction and interventional harm mitigation, while still preserving compassionate therapeutic care. Pharmacist-driven resolution of the opioid misuse epidemic would take maximum advantage of these tools by concurrently addressing multiple areas of need, including consistent risk and harm screening, expanded public education on proper opioid use, ongoing promotion of best-practice opioid prescribing, effective support for medication-assisted recovery from opioid use disorder, and reliable dispensing of pharmacological protection against fatal opioid overdose.[26]

Reducing Likelihood of Opioid Misuse in At-risk Patients

Although open-ended, empathetic, and non-judgmental questioning regarding opioid medication use is often an appropriate and sufficient method to perform a simple assessment for patient risk of misuse, there are also a number of risk screening tools available when formal metrics are desired.[27,28] These include the opioid risk tool (ORT), screener and opioid assessment for patients with pain (SOAPP), diagnosis, intractability, risk, efficacy score (DIRE), the brief risk interview (BRI), brief risk questionnaire (BRQ), and screening instrument for substance abuse potential (SISAP). Although the SOAPP tool is among the most well validated, there is little evidence of superior performance between any of these screening measures, so selection of the appropriate tool is contingent upon considerations such as prior experience and ease of access.[29] Specific assessment of patients for elevated

TABLE 2. Treatment Options for Opioid Withdrawal Symptoms

Withdrawal Symptoms	*Common Treatment Choices*
Autonomic Hyperactivity	clonidine, tizanidine, lofexidine
Muscle Cramps / Pain	ibuprofen, ketorolac tromethamine
Diarrhea	bismuth subsalicylate
Nausea / Vomiting	prochlorperazine, ondansetron
Insomnia	Non-pharmacologic treatments preferred

risk of overdose can be undertaken by providing patients with a self-screening checklist generated by the Wisconsin Department of Health Services.[30] This document allows pharmacists to identify common medication- and patient-related risk factors (Table 1), providing a platform to initiate discussion of how to safely and correctly use opioid medications in the event that such risk factors are identified.

Published guidelines on opioid prescribing are effective tools for verification and implementation of proper therapeutic use.[31] The predominant, current guidelines at the national and local levels are the CDC Guideline for Prescribing Opioids for Chronic Pain and the Wisconsin Medical Examining Board Opioid Prescribing Guidelines.[32,33] Overall, these guidelines espouse four key principles for safe opioid prescribing for the treatment of adults with non-cancer pain: identify and treat the cause of pain, use non-opioid therapies when possible, start with a low dose and increase dosage slowly, and provide close follow-up. Adherence to these key principles should be considered for every opioid prescription that is processed. Additional recommendations from the Wisconsin guidelines include the use of short-acting opioids for initial dose titration, avoiding oxycodone as a first-line therapy, discouraging methadone prescribing by inexperienced or inexpert practitioners, and writing new prescriptions for treatment of acute pain to less than three days in most cases. Pharmacists should communicate with prescribers to clarify and correct when deviations from these recommendations are identified, remembering that the desired outcome is to support safe use of opioids overall, rather than to simply limit access.[34]

Consultation of the enhanced Wisconsin Prescription Drug Monitoring Program (ePMDP) will now identify more cases of potential opioid misuse due to an administrative rule change allowing e-prescribing for Schedule II controlled substances and recent legislation mandating practitioner review upon initial prescription of a schedule II drug.[35-36] This law resulted in dramatically increased overall use of the ePDMP in 2017, although pharmacist use remained relatively steady at round 70,000 queries per month.[37] The same legislation also decreased the time requirement for submission of dispensing information from 7 days to 24 hours, to make the database more timely and accurate. In addition to multiple prescriber and/or dispenser alerts, the ePDMP also provides safety alerts regarding specific actionable scenarios that increase risk of overdose, such as concurrent opioid and benzodiazepine overlap.[38]

In terms of risk communication, the provision of proper storage and disposal instructions to patients using opioids remains an important pharmacist task. The majority of misused prescription medications are given by, bought from, or taken from a friend or relative.[39] Therefore, pharmacists should continue to counsel patients to store opioids in a secure, preferably locked, location, and offer self-disposal instructions for opioids. These options include trashing them with coffee grounds or kitty litter, or flushing unused medications down the toilet, as many opioids are on the approved Food and Drug Administration (FDA) flush list.[40] Furthermore, the increasing availability of community resources for returning or destroying unused or unwanted opioid medications should also be emphasized. These resources include a growing network of drug takeback locations such as local police or fire stations, expansion of mail-back programs, and periodic statewide drug take-back days.

Mitigating Harms for Patients with Opioid Use Disorder (OUD)

While the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) is the prevailing standard for providers to identify OUD, there are also several screening tools available for pharmacists to quickly identify concerning opioid misuse patterns in the absence of information regarding a formal OUD diagnosis.[41] These include the current opioid misuse measure (COMM), the drug abuse screening tool-20 (DAST-20), and the National Institute on Drug Abuse-modified Alcohol, Smoking, and Substance Involvement Screening Test (NM-ASSIST) screen.[28,29] Although more evidence is needed to determine their validity in pharmacy settings, these tools can still support preliminary stratification of patients with, lower, moderate, or high risk opioid misuse, providing the opportunity to advise on proper medication use, assess patient readiness to change, offer assistance with the process of changing, and arranging a referral for specialty OUD assessment and treatment, if necessary.

Amongst patients diagnosed with OUD, pharmacists have a direct role in the management of current opioid therapy, including initiation of a dose taper regimen and associated withdrawal symptom support. The recommended rate of taper in patients experiencing harms from opioid use is a 25% reduction in morphine milligram equivalents (MME) per week, although this range can vary between 2 – 50%, depending on setting and patient needs.[33,42] If patients need pharmacologic support for autonomically-mediated withdrawal symptoms such as lacrimation, rhinorrhea, sweating, chills, hypertension, tachycardia, or mydriasis during this taper, pharmacists can recommend use of an appropriate agent, such as oral clonidine or tizanidine.[33] Ancillary symptoms

arising from withdrawal should be treated supportively as needed (Table 2).[43] Options for ongoing medication assisted treatment (MAT) should also be communicated to patients with OUD and their providers, including monthly naltrexone intramuscular injections, daily methadone oral tablets, and daily buprenorphine-containing sublingual preparations.[44] When selecting an appropriate MAT regimen, the potential for precipitation of withdrawal symptoms with naloxone and buprenorphine should be considered, as should the dose accumulation and elevated risk of overdose with methadone. Integration of appropriate non-opioid and non-pharmacologic pain control methods in individuals experiencing ongoing pain is also a crucial consideration for compassionate treatment of these patients.

Mitigating Harms in Cases of Opioid Overdose

Education of members of the public to recognize and respond to opioid overdose symptoms is an effective method by which mortality due to opioid misuse can be reduced.[45,46] Opioid overdose is characterized by respiratory depression, manifesting as slow, shallow, or absent breathing. An overdosing individual will be difficult to rouse, including by yelling or painful stimuli, such as a sternal knuckle rub. They may make snoring, gurgling, or choking noises while asleep or nodding off. Additionally, they may be vomiting, have blue or pale lips, skin, or fingernails, and the individual's face may appear pale or clammy. Incorporating a frank discussion of these symptoms alongside other potential adverse effects of opioid medication is recommended, especially in patients with risk factors that increase the likelihood of overdose. When overdose is suspected, individuals should call 911, open the airway and give one rescue breath every five seconds if the individual is not breathing and has a pulse, give naloxone if available, place the person on their side with the top leg and arm crossed over the body, and stay with the individual until help arrives, re-administering naloxone as directed.[47]

As a component of this response, administration of the opioid receptor antagonist naloxone is the most effective method to avoid a fatal opioid overdose, reversing 89% of cases where it is used.48 Pharmacists in Wisconsin may now dispense naloxone without a prescription pursuant to a statewide standing order. Consistent application of this authority by pharmacists has the potential to drastically alter the trajectory of the opioid misuse epidemic in the state and significantly reduce opioid overdose mortality, as one life can be saved for every 227 naloxone kits dispensed.[49] Unfortunately, the stigma associated with opioid use disorder currently results in very high rates of patient resistance to hear about or accept naloxone.[50,51] Therefore, in order to maximize the impact of this intervention, pharmacists need to be cognizant of this stigma and take steps to actively mitigate its impact. This includes avoiding terms like 'addict' during discussion and normalizing naloxone dispensing as a measure that is undertaken as a matter of course to maximize the benefits of opioid use while limiting its potential risks.

Specific naloxone products available for dispensing include intramuscular injections (manual or auto-injector) and intranasal sprays (single-step or multistep). The single-step nasal spray is a simple, widely-available, and easily-

transportable method suitable for use by most individuals who have received basic administration information. The auto-injector is a useful option where the individual administering the naloxone is likely to have limited experience or information about the situation and patient, as it provides audible step-by-step instructions for use; however, these instructions are only provided in English.[52] All naloxone containing products should be protected from light and prevented from undergoing extreme temperature fluctuations. Products with needles should be placed in a puncture-proof container upon use, and any unused or expired naloxone should be returned using a drug take-back program. Naloxone dispensing records under the statewide standing order need to be reported quarterly using prescriber number 1346552668, including the number of doses dispensed, number of refills dispensed, number of different dosage forms dispensed, and any challenges or barriers encountered.[20,21] Patient counselling on any of these naloxone products should cover overdose risk factors, overdose signs/symptoms, and overdose response measures, along with administration, storage, and disposal instructions. If the individual being counseled on naloxone rescue is also the one taking an opioid medication, they should be instructed to communicate this naloxone use information with a caregiver or other responsible individual, as the patient would likely be unresponsive or too confused to take action themselves in the event of an overdose.

Summary Statement

The tragic impact of the opioid misuse epidemic continues to be felt throughout the country and within the state of Wisconsin, especially through fatal opioid overdose. However, recent legislative changes have provided pharmacists with direct access to life-saving pharmacological tools to address this problem, as well as improved screening measures to recognize and correct misuse. Furthermore, specific guidelines are available to optimize opioid therapy at a population level, and access to MAT options for patients with OUD continues to expand. By employing these tools, pharmacists have the opportunity to build upon recent gains in this high-need area, directly saving patient lives across the state of Wisconsin.

Background on *Clostridium difficile*

Clostridium difficile is the most common pathogen causing healthcare-associated infections.[53] *C. difficile* is a spore forming bacteria that can cause diarrheal infections ranging from mild-moderate to life threating colitis and sepsis. Patients will usually present with diarrhea and abdominal cramps and other signs of infection including, increased white blood cell count; CDI is diagnosis by a stool test.

At the turn of the century *C. difficile* infection (CDI) caused massive outbreaks in hospitals across North America and Canada that were associated with highly virulent *C. difficile* strains.[54] Since then CDI bundle approaches for appropriate prevention, treatment and diagnosis, along with antibiotic stewardship programs have halted what was a rapid increase in infection rates.[55,56] Nonetheless, the CDC continues to classify CDI as an urgent threat. CDI is also occurring without recent healthcare exposure or as community onset CDI, in recently discharged patients, and in long-term care facilities.[57]

Epidemiology of *Clostridium difficile*

According to the CDC *C. difficile* is associated with 453,000 infections per year and about 15,000 of these infections result in death directly attributable to CDI.[58] *C. difficile*, transmitted via a fecal oral route, can be toxigenic or non-toxigenic. Non-toxigenic strains can colonize the gut of individuals without infection. The toxigenic form can lead to active infection, especially in the setting of antibiotic use that kills normal gut flora, but not *C. difficile*, allowing it to overgrow. The toxins cause intestinal enterocytes to loose integrity and subsequently cause an inflammatory response, associated with the severity of the infection.[59] CDI incidence and severity increased rapidly, including fatal outbreaks in the early 2000s. These outbreaks were associated with the hypervirulent *C. difficile* BI/NAP/027 strain. However, a recent CDI epidemiology study conducted across Veterans Affairs Medical Centers (2011-2016) found a decrease in the overall BI/NAP/027 strain prevalence from a high of 26.2% in 2013 to 16.9% in 2016.[56] The recently revised Infectious Diseases Society of America (IDSA) guideline classifies CDI by severity and setting/timing of onset, including healthcare associated (healthcare facility onset [>3 days after admission] or community-onset/healthcare associated [within 12 weeks of healthcare facility discharge]) and community associated.[60]

Antibiotic exposure is the most critical and modifiable CDI risk factor. Antibiotics associated with high CDI risk are those that are broad spectrum and affect normal gastrointestinal flora. A meta analysis of antibiotic classes and community-associated CDI risk found clindamycin, fluoroquinolones, and a combined group of cephalosporins, monobactams, and carbapenems had a high CDI risk. Macrolides, sulfonamides-trimethoprim, and penicillins had a lower CDI risk. Tetracycline had no association with CDI in this study.[61] Prolonged antibiotic durations and multiple antibiotics also increase risk. In a study of cumulative antibiotic exposure patients who received 1st-2nd generation cephalosporins (HR 2.4), 3rd-4th generation cephalosporins (HR 3.1), quinolones (HR 4.5), and sulfa drugs (HR 1.8), intravenous vancomycin (HR 2.6) were more likely to develop CDI relative to patients who did not receive these antibiotics, independent of other antibiotics received. The minimal gastrointestinal exposure from intravenous vancomycin exposure is thought to disrupt normal flora enough for *C. difficile* to overgrow without killing it. Patients who received two antibiotics had a 2.5-fold increase in risk compared to those who received one antibiotic.[63] The increased risk of CDI persists during antibiotic therapy and three months following therapy discontinuation. Even a prophylactic single dose of an antibiotic can increase a patient's risk of CDI.[60]

Additional CDI risk factors are advanced age, female sex, gastrointestinal tract surgery, immunosuppression from a medication such as chemotherapy or disease, and proton pump inhibitors. In the US and high resource settings, the majority

of deaths (80%) are associated with patients aged 65 or older.[64] This finding is likely attributable to the age at which healthcare exposure, antibiotic use, and comorbid conditions and complexity increases. For example, a recent epidemiology study in South Africa found the average age of patients testing positive for *C. difficile* was 46.5 years and the study identified tuberculosis as a novel risk factor for CDI, in a population with high HIV and tuberculosis prevalence.[62]

Treatment Considerations and Guideline Updates of *Clostridium difficile*

Historically metronidazole and vancomycin were associated with similar clinical cure and recurrence rates (metronidazole 500 mg by mouth three times daily for ten days, vancomycin 125 mg by mouth four times daily for ten days). IDSA clinical practice guidelines for CDI were updated in early 2018. These guidelines and recent evidence support initial CDI treatment with either vancomycin or fidaxomicin (fidaxomicin 200 mg by mouth twice daily for 10 days). Metronidazole shifted from previously a first line agent for mild-moderate CDI to only be used when other therapies are contraindicated or unavailable in non-severe cases (WBC ≤15000 cells/mL and a serum creatinine level <1.5 mg/dL). Similar to the previous 2010 guidelines metronidazole is not recommend for severe CDI episodes.[56,60]

Recent evidence supports the new guidelines. For severe CDI infections, vancomycin is associated with a significant reduced risk of all cause 30-day mortality compared to metronidazole.[65] Furthermore, a 2017 Cochrane review of all severity found vancomycin was more effective than metronidazole for achieving symptomatic cure (79% vs. 72%, RR 0.90, 95% CI 0.84 to 0.97). Fidaxomicin was found to be more effective than vancomycin for achieving symptomatic cure (71% vs. 61%, RR 1.17, 95% CI 1.04 to 1.31). The authors noted the differences between the antibiotics are not great, while the cost differences between options are substantial. Ten-day CDI treatment courses were reported as: metronidazole $13, vancomycin tablets $1779, and fidaxomicin tablets $3453.[66] The cost associated with administration of the intravenous formulation of vancomycin orally is less than the capsules. A liquid vancomycin formulation was approved in 2018 and costs much less than the capsules.

Approximately 20% of successfully treated patients experience CDI recurrence, due to re-exposure or reactivation of spores, and this risk increases with each recurrence.[60,67] Recurrence risk is similar when patients are treated with vancomycin compared to metronidazole. However, clinical trials comparing fidaxomicin to vancomycin found fidaxomicin reduced risk of recurrence (15.4% vs. 25.3%) while clinical cure rate was similar. While fidaxomicin is significantly more expensive, it may be of greater benefit for patients experiencing recurrence. For patients with multiple CDI recurrences and treatment failures, fecal microbiota transplantation (FMT) is recommended and has proven to be highly effective with cure rates often greater than 90%.[60] FMT may have a role in initial CDI therapy in the future.

Additionally CDI management should include discontinuation of any antibiotics that may be contributing to CDI if clinically appropriate as soon as possible. Loperamide is contraindicated in CDI due to containment of the *C. difficile* toxins and should be discontinued if used. As with any diarrheal illness adequate rehydration and electrolyte balance is imperative. *C. difficile* spores can withstand alcohol hand sanitizer and can be transmitted between hospitalized patients and healthcare providers. Therefore, healthcare providers providing care to CDI patients should use contact precautions, gowns and gloves, and hand washing with soap and water to prevent transmission to other patients.

Role of Pharmacists in *Clostridium difficile*

Pharmacists can play a key role in CDI prevention, identification, and treatment. One of the most important roles is advocating for antimicrobial stewardship, the appropriate antibiotic use of antibiotics to reduce CDI risk and development of antimicrobial resistance. Pharmacists can review the appropriateness of antibiotic therapy and ensure antibiotics are only used when necessary. When possible, pharmacists can recommend lower risk antibiotics to reduce CDI risk. Pharmacists can also play a key role in antimicrobial stewardship programs. Stewardship interventions can include reducing the use and duration of high-risk antibiotics through formalized antibiotic restrictions and other measures. Stewardship interventions have been associated with significant reductions in CDI incidence in hospitals after epidemic outbreaks and overtime.[68]

Pharmacists should consult patients receiving an antibiotic on the risks associated with that antibiotic, including association with CDI. Pharmacist should advise patients to contact their doctor if they experience severe diarrhea or watery diarrhea that occurs three or more times per day and is not resolving. The pharmacist can also educate patients on why appropriate antibiotic use is important; antibiotic use increases the risk of antibiotic resistance development that may affect both the patient and their community.[69] Pharmacists working in transitions of care roles can ensure CDI contact precautions and treatment are continued if patients are transitioning from a hospital to long-term care setting.

CDI primary prevention vaccines are currently in development. Once approved, pharmacists can play a key role in CDI prevention by identifying patients who meet vaccination criteria and achieving high vaccination rates.[70] A phase III clinical trial is currently recruiting subjects with expected completion in 2020 (NCT03090191).

Pharmacists are commonly asked about the benefits of probiotics. While several studies have evaluated the role of probiotics in CDI, the updated IDSA guidelines state "there are insufficient data at this time to recommend administration of probiotics for primary prevention of CDI outside of clinical trial".[60] The statement reflects the limitations of the meta analyses and evidence quality suggesting probiotics may be effective for preventing CDI. A Cochrane analysis concluded short-term probiotic use appears to be safe and effective, but should not be used in immunocompromised or severely

TABLE 3. Adiposity-Based Chronic Disease[73]

Diagnostic Criteria	*Disease Stage*	*Suggested Therapy*
BMI <25 kg/m2 (BMI <23 kg/m2 for certain ethnicities)	Healthy weight (no obesity)	**Primary prevention** (Healthy lifestyle)
BMI 25-29.9 kg/m2 with no complications* (BMI 23-24.9 kg/m2 for certain ethnicities)	Overweight stage 0	**Secondary prevention** (Lifestyle therapy)
BMI >30 kg/m2 with no complications* (BMI >25 kg/m2 for certain ethnicities)	Obesity stage 0	**Secondary prevention** (Lifestyle therapy; add weight-loss medications if needed for BMI >27)
BMI >25 kg/m2 with 1 or more mild to moderate complications* (BMI >23 kg/m2 for certain ethnicities)	Obesity stage 1	**Tertiary prevention** (Lifestyle therapy; add weight loss medications if needed for BMI >27)
BMI >25 kg/m2 with at least 1 severe complication* (BMI >23 kg/m2 for certain ethnicities)	Obesity stage 2	**Tertiary prevention** (Lifestyle therapy; add weight loss medications if needed for BMI >27; may consider bariatric surgery if BMI >35)

BMI – Body Mass Index
Mild/Moderate – conditions generally well controlled
Severe – conditions generally uncontrolled

**Complications include metabolic syndrome, prediabetes, type 2 diabetes, dyslipidemia, hypertension, cardiovascular disease, nonalcoholic fatty liver disease, polycystic ovary syndrome, female infertility, male hypogonadism, obstructive sleep apnea, asthma/reactive airway disease, osteoarthritis, urinary stress incontinence, gastroesophageal reflux disease, or depression*

debilitated.[71]

Pharmacists can also identify patients at risk for CDI and ensure timely testing and management. Pharmacists ensure CDI treatment prescriptions and orders are effective. For example, vancomycin CDI therapy must be administered by mouth to reach site of infection as intravenous vancomycin gut penetration is negligible. Renal adjustment is not necessary for oral vancomycin because it is not systemically absorbed. Often the intravenous formulation is administered in water orally as the oral capsules may be cost prohibitive.

Background and Epidemiology of Obesity

The national rate of obesity has been on the rise in the US over the last 40 years for adults and children.[72] National data regarding obesity rates is collected annually via the National Health and Nutrition Examination survey (NHANES). In 2015-2016, national averages indicated that 39.6 percent of adults and 18.5 percent of children were considered obese. Differing rates of obesity are seen among different demographic groups when analyzed by race and ethnicity, gender, age, socioeconomic status, highest level of education, and residential setting (urban versus rural). In the state of Wisconsin, the most recent rates of obesity collected are 32.0 percent in adults (2017), 14.7 percent in 2- to 4- year-old WIC participants (2014), and 14.3 percent in 10- to 17-year-old adolescents (2016-2017).[73]

Obesity is defined as an unhealthy level of body fat.1 Previously, obesity was determined by measuring a patient's body mass index (BMI), which is calculated as follows:

$$\text{BMI} = \frac{(\text{weight (kg)}}{[\text{height (m)}]^2}$$

In adults, patients with BMI measurements over 30 kg/m2 were considered to be obese, with patients with a BMI measuring over 40 kg/m2 classified as severely obese. For children and adolescents, obesity is determined by comparing a child's own BMI to BMI-for-age charts produced by the CDC to determine which percentile they fall in when compared to children of the same age and gender. Children in the 95th percentile and above are classified as obese, with those measuring at 120 percent of the 95th percentile and above being classified as severely obese. However, BMI is not a direct measurement for body fat, prompting more recent guidelines to further define how obesity is classified. The American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) released a set of clinical practice guidelines for the diagnosis and management of patients with obesity in 2016, replacing the term obesity with the more medically-defined diagnostic term adiposity-based chronic disease (ABCD).[73] This set of guidelines also recommends that waist circumference and the related risk of comorbid conditions be evaluated, in addition to BMI, when assessing patients for the diagnosis and staging of ABCD. The staging criteria for ABCD are located in Table 3.

Primary prevention of ABCD involves promoting lifestyle factors that prevent weight gain, such as following a healthy meal plan, engaging in regular physical activity, and behavior modification.[73] Secondary prevention of patients who are diagnosed with ABCD aims to promote weight loss, prevent further weight gain, and prevent the development of weight-related comorbid conditions. Patients with obesity are at a higher risk for the development of many chronic conditions such as type 2 diabetes, hypertension and other cardiac diseases, stroke, sleep apnea, and kidney disease.[72] Lifestyle modifications are also the first-line

TABLE 4. Obesity Medications Compared[74-81]

Generic Name	Brand Name(s)	Starting Dose	Maximum Dose	Common Adverse Effects	Contraindications
Orlistat	Xenical®; Alli®	120mg three times daily; 60mg three times daily	120mg three times daily	increased defecation, fecal urgency, flatus, oily spotting, steatorrhea	chronic malabsorption syndrome, cholestasis
Lorcaserin	Belviq®, Belvix XR®	10mg twice daily; 20mg XR once daily	10mg twice daily; 20mg XR once daily	constipation, headache, hypoglycemia, nausea, dizziness, fatigue	pregnancy
Phentermine	Adipex-P®; Lomaira™	37.5mg once daily, 15mg once daily; 8mg three times daily	37.5mg once daily, 30mg once daily; 8mg three times daily	insomnia, constipation, diarrhea, headache, dry mouth	cardiovascular disease, monoamine oxidase inhibitor use, hyperthyroidism, glaucoma, history of drug abuse, pregnancy
Phentermine/ Topiramate ER	Qsymia®	3.75mg/23mg once daily	15mg/92mg once daily	constipation, dizziness, abnormal taste, insomnia, paranesthesia, dry mouth	cardiovascular disease, monoamine oxidase inhibitor use, pregnancy, glaucoma, hyperthyroidism
Naltrexone/ Bupropion	Contrave®	8mg/90mg once daily	8mg/90mg - 2 tablets twice daily	headache, dizziness, insomnia, nausea, vomiting, diarrhea, constipation, dry mouth	uncontrolled hypertension, seizure disorder, chronic opioid use, monoamine oxidase inhibitor use. Black box warning: increased suicidal thoughts or behaviors.
Liraglutide	Saxenda®	0.6mg once daily	3mg once daily	gastrointestinal upset, tachycardia, headache, dizziness, fatigue, local injection site reactions, hypoglycemia, new or worsening depression	medullary thyroid carcinoma, multiple endocrine neoplasia syndrome, pregnancy

treatment for secondary prevention, but may be supplemented with prescription medications if progress is not seen after using lifestyle modifications alone for 6 months.[73] Patients that meet predefined criteria may also be candidates for bariatric surgery; however, this topic is not a focus of this article.

Available Medications for Obesity Management

A variety of medications with varying mechanisms of action have received FDA approval for chronic weight management, many of which are newer agents that have only been introduced to the market within the last decade. As stated above, it is important to keep in mind that weight-loss medication is a second-line therapy, and lifestyle modifications should be continued in conjunction with starting any of these pharmaceutical products.

Orlistat (Xenical®) is a serotonin 2C receptor agonist indicated for chronic weight management in adults and adolescents age 12 years and older with a baseline BMI >30 kg/m2, or with a baseline BMI >27 kg/m2 with at least one weight-related comorbid condition (e.g., hypertension, type 2 diabetes mellitus, and/or dyslipidemia).[74] This medication works to inhibit the activity of lipases in the stomach and small intestine and therefore prevents the absorption of dietary fats. Patients should take one 120 mg capsule orally three times daily during or up to one hour after a fat-containing meal in conjunction with a dietary management plan. An over-the-counter orlistat product, called Alli, is available as a 60 mg capsule.[75] The OTC packaging instructs patients to take one 60 mg capsule orally with a fat-containing meal, not to exceed more than three capsules daily (180 mg). Patients taking orlistat concomitantly with cyclosporine or levothyroxine should separate these medications by three and four hours from doses of orlistat, respectively. The most common adverse effects seen during use of this medication are increased defecation and fecal urgency, flatus, oily spotting and steatorrhea.

Lorcaserin (Belviq®) is another serotonin 2C receptor agonist approved for use in weight management in adults with a baseline BMI >30 kg/m2, or with a baseline BMI >27 kg/m2 with at least one weight-related comorbid condition.[76] The recommended dose of the immediate-release formulation is 10 mg orally twice daily. Lorcaserin is also available as an extended-release formulation (Belviq XR®), which is available as a 20 mg oral tablet that is taken once daily. Either formulation may be taken with or without food, and the extended-release tablets should not be crushed or chewed. Lorcaserin is classified as a class IV controlled substance in the US based on its potential for abuse; therefore, its use should be avoided in patients with a history of substance abuse. Patients who have not seen greater than or equal to 5 percent weight loss compared to baseline after 12 weeks of therapy should discontinue use (either formulation). This medication should be used with caution in patients with renal or hepatic impairments, but no specific dose adjustments are recommended by the manufacturer. Lorcaserin and lorcaserin extended-release should not be used during pregnancy (category X). The most common side effects of this medication are constipation, headache, hypoglycemia (in diabetic patients), nausea, dizziness, and fatigue. Patients should also be cautious and monitor for signs and symptoms of serotonin syndrome if using lorcaserin/

lorcaserin extended-release concomitantly with other serotonergic agents (bupropion, monoamine oxidase inhibitors, serotonin reuptake inhibitors, serotonin and norepinephrine reuptake inhibitors, triptans, etc.).

Phentermine (Adipex-P®) is a noradrenergic agent approved for short-term treatment of obesity in adults and adolescents age 16 years and older in combination with lifestyle modifications.[77] Phentermine is available as generic 37.5 mg tablets (37.5 mg taken orally once daily in the morning) or 15 mg capsules (15-30 mg taken orally once daily in the morning). An 8 mg oral tablet is also available (Lomaira™) and should be taken orally three times daily.[78] Phentermine works to increase endogenous norepinephrine and dopamine, which promotes weight loss through an increased resting metabolic rate and suppressed appetite. Dose adjustments should be provided for patients with renal impairment, and should not be used in pregnancy. Phentermine is classified as a class IV controlled substance in the US based on its potential for abuse; therefore, its use should be avoided in patients with a history of substance abuse. The most common adverse effects seen with use of this medication are insomnia, constipation, diarrhea, headache and dry mouth.

Phentermine is also available as a combination product with a second noradrenergic agent, topiramate extended-release (ER; Qsymia®), for chronic weight management in adults with a baseline BMI >30 kg/m2, or with a baseline BMI >27 kg/m2 with at least one weight-related comorbid condition.[79] Patients are initiated on the medication by taking one phentermine 3.75 mg/topiramate ER 23 mg capsule orally once daily for 14 days, and are then increased to a maintenance dose of one phentermine 7.7 mg/topiramate ER 46 mg capsule once daily. After 12 weeks, if patients have not lost at least 3 percent of baseline weight, use should be discontinued or increased to one phentermine 11.25 mg/topiramate ER 69 mg capsule once daily for 14 days, and then increase further to one phentermine 15 mg/topiramate ER 92 mg capsule once daily for 12 weeks. If at least 5 percent of baseline body weight has not been lost since dose escalation, therapy should be discontinued by de-escalating the dose to one capsule every other day for one week. Dose adjustments should be performed in the setting of renal and/or hepatic impairments. The most common adverse effect seen with this combination therapy are constipation, dizziness, abnormal taste, insomnia, paresthesia and dry mouth. Patients with a history of cardiovascular disease, including coronary artery disease, stroke, arrhythmias, congestive heart failure or uncontrolled hypertension should not be prescribed any product containing phentermine.[79]

A combination product containing naltrexone (an opioid antagonist) and bupropion (a norepinephrine and dopamine reuptake inhibitor) is indicated for chronic weight management in adults with a baseline BMI >30 kg/m2, or with a baseline BMI >27 kg/m2 with at least one weight-related comorbid condition.[80]

Although the exact mechanism of this product is not understood, it is likely that it exerts effects on multiple areas of the brain, including the reward system, to regulate appetite and aid in weight loss. Available as brand name Contrave®, this medication is initiated at one naltrexone 8 mg/ bupropion 90 mg tablet orally in the morning for one week. Then, doses are increased to one tablet twice daily for one week; then, two tablets in the morning and one tablet in the evening for one week. A maintenance dose of two tablets in the morning and two tablets in the evening is taken daily thereafter. Patients who do not see a weight loss of at least 5 percent from baseline after using the maintenance dose for 12 weeks should discontinue use. Dose adjustments should be performed for patients using this medication in the setting of renal or hepatic impairment. Patients should be advised that this product carries a black box warning for the potential to cause increased suicidal thoughts or behaviors. The most common adverse effects of this medication are headache, dizziness, insomnia, nausea, vomiting, diarrhea, constipation and dry mouth.

Liraglutide (Saxenda®) is a human glucagon-like peptide-1 (GLP-1) receptor agonist that has received FDA approval for the management of obesity in adult patients with a baseline BMI >30 kg/ m2, or with a baseline BMI >27 kg/m2 with at least one weight-related comorbid condition.[81] Liraglutide is also approved for use in the management of type 2 diabetes (Victoza), but the products are not interchangeable between indications. In terms of weight management, endogenous GLP-1 works in the body to slow gastric emptying, which decreases caloric intake by promoting feelings of satiety. Liraglutide is used as a once-daily subcutaneous injection, initiated at a starting dose of 0.6 mg daily. The daily dose should be increased by 0.6 mg increments at weekly intervals until a maintenance dose of 3 mg daily is achieved. Daily injections should be administered into the abdomen, thigh or upper arm without regards to meals. Patients that do not see greater than or equal to 4 percent weight loss compared to baseline after 16 weeks should discontinue use. Since liraglutide delays gastric emptying, the potential for impacts on absorption of oral medications should be monitored. Common adverse effects include gastrointestinal upset (such as nausea, vomiting, diarrhea or constipation, abdominal pain, decreased appetite, and/ or dyspepsia), tachycardia, headache, dizziness, fatigue, local injection site reactions (such as redness, itching or rash), hypoglycemia (especially when used in combination with sulfonylureas in patients with diabetes), and new or worsening depression or suicidal behaviors. This medication carries a Black Box Warning for the risk of development of thyroid t-cell tumors, and should not be used in patients with a personal or family history of medullary thyroid carcinoma or multiple endocrine neoplasia syndrome type 2. Liraglutide use is also contraindicated in pregnancy and should be used with caution in patients with renal or hepatic impairments.

The Pharmacist's Role in Obesity Management

Pharmacists are often considered one of the most accessible healthcare providers due to their presence in the retail setting and are adequately trained to assist patients in achieving their weight loss goals. One of the ways that pharmacists can help patients looking to lose weight is to assist them in the development of healthy eating and exercise plans. First, patients should be engaged in motivational interviewing to determine their readiness to make a change. Once a patient is ready to implement lifestyle modifications, pharmacist can assist patients with development of their plan. The current set of AACE and ACE guidelines recommend that patients attempting weight loss begin a reduced-calorie meal plan, participate in 150 minutes of aerobic physical activity over three to five days per week, and modify their behaviors (such as self-monitoring of food intake and goal setting) to achieve weight loss.[67] Pharmacists are also in a great position to provide ongoing support and encouragement to patients throughout their weight loss journey, as most pharmacists will see patients every one to three months when they visit the pharmacy to obtain medication refills.

Pharmacists are also able to provide patients initiating weight loss medication therapy with appropriate medication counseling to supplement information that their provider may have already shared with them. Medication counseling for these types of medications should always include administration directions (i.e. with or without food, or injection technique for liraglutide), adverse effects and how to manage them, and monitoring parameters (i.e. when they should expect to see results, or certain parameters that should be monitored for safe and effective use). Pharmacists in both the inpatient and outpatient setting may also receive postoperative medication inquiries from patients or other healthcare providers when patients undergo weight loss surgeries. For example, the absorption of certain medications may be affected and a patient's medication regimen may need substituting and/or adjusting of therapies to accommodate these physiological differences. Nutritional supplements are also an area in which pharmacists can provide support to postoperative patients, as they will also be less able to obtain these nutrients from their diet after surgery.

Summary of Obesity Epidemic

Obesity rates have continued to climb to alarming rates in the US, with national rates mirrored in Wisconsin. Recently updated guidelines promote well-defined methods for diagnosing, classifying and managing ABCD. There are many different medication options available to patients that are not able to be managed through lifestyle modifications alone. Pharmacists are the most accessible healthcare providers in the community and are adequately trained to provide patients with education and support as they work towards accomplishing their weight management goals.

Conclusion

Opioid abuse, CDI and obesity are three epidemics that are currently affecting the State of Wisconsin and the US. This article has shown ways in which pharmacists are uniquely positioned to help combat these epidemics through a variety of mechanisms.

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Assessment Questions

1. The CDC defines an epidemic as, "a gradual and often minor increase in the number of cases of a disease above what is normally expected in that population area."
   a. True
   b. False

2. What was the approximate mortality rate per 100,000 individuals due to opioid overdose in Wisconsin in 2016?
   a. 26.2
   b. 20
   c. 20,600
   d. 827

3. A key principle of current guidelines for opioid prescribing is 'start with a low dose and increase dosage rapidly'.
   a. True
   b. False

4. Patient counseling on naloxone kits for opioid overdose should include which of the following topics?
   a. Overdose risk factors
   b. Overdose response measures
   c. Administration instructions
   d. All of the above

5. What class of antibiotics is associated with a high CDI risk?
   a. Fluoroquinolones
   b. Macrolides
   c. Sulfonamides-trimethoprim
   d. Penicillins

6. According to the CDC, CDI is associated with 453,000 infections per year and about 15,000 of these infections result in death directly attributable to CDI.
   a. True
   b. False

7. Which of the following is NOT a way pharmacists can help combat the CDI epidemic?
   a. Recommend lower risk antibiotics
   b. Educate patients receiving an antibiotic on the risks associated with that antibiotic, including association with CDI
   c. Become involved with antimicrobial stewardship
   d. Always recommend probiotics

8. What was the rate of obesity for adults in the state of Wisconsin in 2017?
   a. 14.7%
   b. 18.5%
   c. 32.0%
   d. 39.6%

9. What is the most common monitoring parameter to measure efficacy of prescription weight loss medications?
   a. Body-mass index (BMI)
   b. Percentage of weight loss from baseline after a specified time period
   c. Development of weight-related complications
   d. Daily calorie intake

10. Which of the following are common side effects of medications available for chronic weight management?
    a. Gastrointestinal upset (nausea/vomiting, constipation and/or diarrhea)

b. Dizziness or fatigue
c. Headache
d. All of the above

11. Which of the following are ways that a pharmacist can help patients reach their personal weight management goals?
    a. Provide adequate medication counseling for medications used in chronic weight management
    b. Engage patients using motivational interviewing techniques to assess readiness to make lifestyle modifications
    c. Provide education and aid patients in monitoring for other weight-related health complications (e.g. diabetes, hypertension, etc.)
    d. All of the above

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

13. 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.

14. 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.

15. 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.

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

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

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

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

20. If you answered "no" to question 19, please comment (email info@pswi.org).

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

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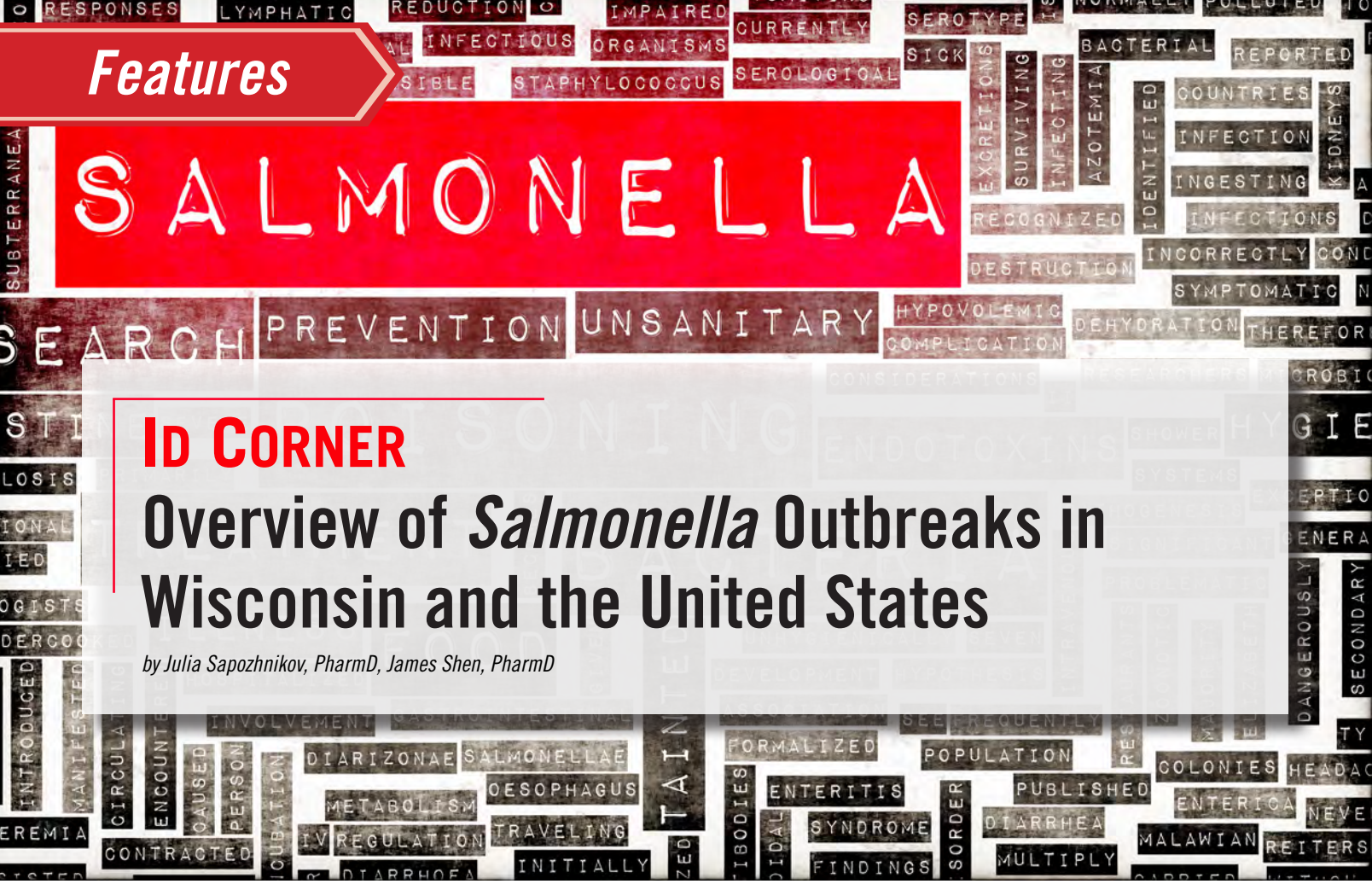


ID Corner

Overview of *Salmonella* Outbreaks in Wisconsin and the United States

by Julia Sapozhnikov, PharmD, James Shen, PharmD

Salmonellosis is a common gastrointestinal illness caused by the Gram-negative bacilli bacteria *Salmonella*.[1] More than 95% of human *Salmonella* infections occur through the ingestion of a contaminated food item, most commonly meat, poultry, eggs, unpasteurized dairy products, and fresh produce.[2] Additionally, transmission can occur through the handling of reptiles, chickens, birds, and other animals without thorough handwashing afterwards. Multiple reports of reptile-associated transmissions have occurred in the United States, accounting for approximately 3-5% of *Salmonella* infections in the United States.[1]

Within the *Salmonella* genus, there are over 2,500 different serotypes, but many are rare and unstudied with less than 100 serotypes accounting for most human infections. The most common serotypes identified in the United States includes *Salmonella* serotype Typhimurium and *Salmonella* serotype Enteritidis.[2] The Centers for Disease Control and Prevention (CDC) estimates that *Salmonella* causes about 1.2 million illnesses, 23,000 hospitalizations, and 450 deaths in the United States every year.[2] Patients at the highest risk of developing *Salmonella* infection include children under the age of five. As with most foodborne illnesses, the peak occurrence occurs during the summer months.

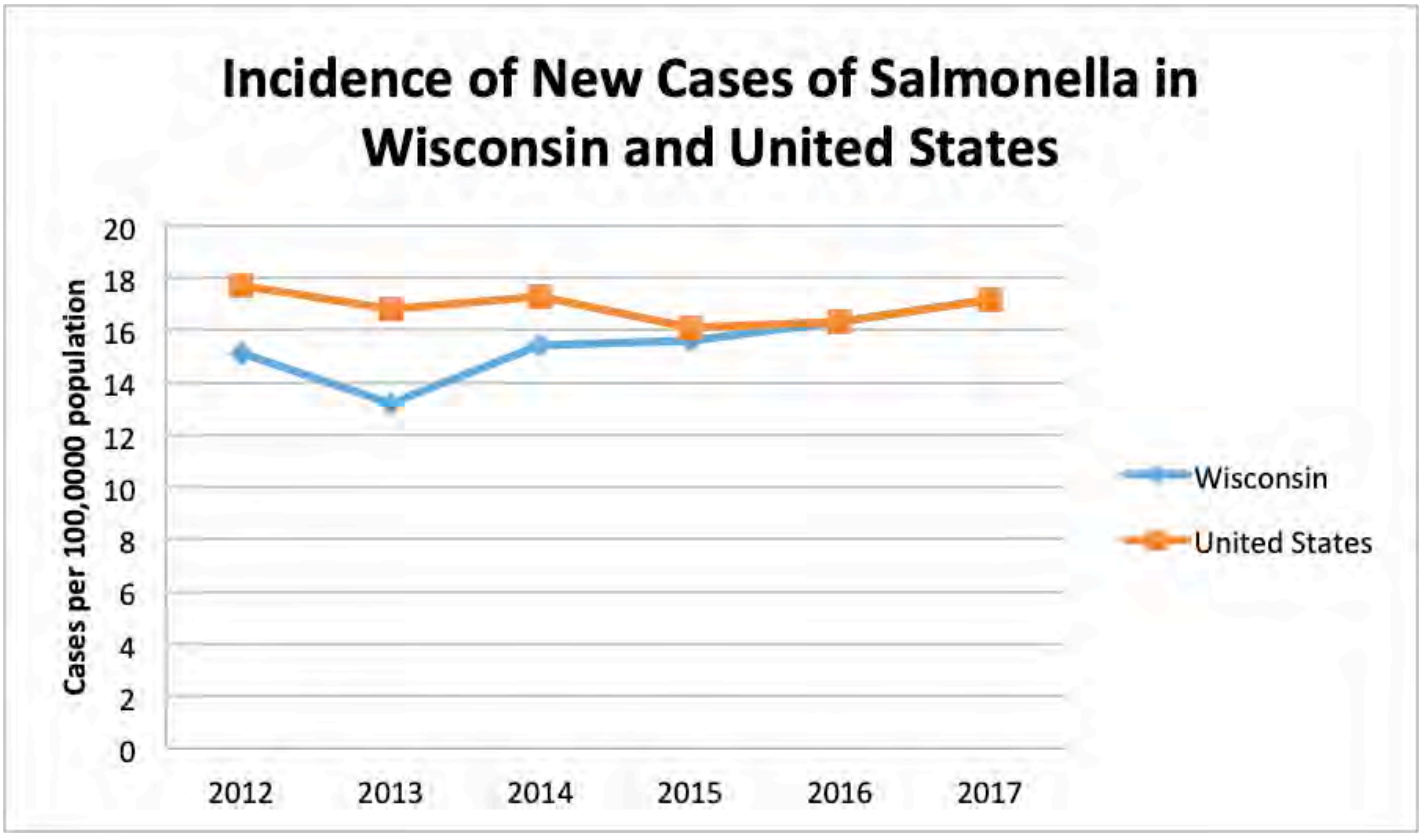
The most common form of salmonellosis is a self-limited, uncomplicated gastroenteritis leading to diarrhea, abdominal cramps, nausea, vomiting, and fevers in infected individuals. The onset of symptoms typically occurs between 12 and 72 hours after infection, with the illness lasting anywhere between 4 to 7 days.[2] Symptoms are usually indistinguishable from other gastrointestinal (GI) pathogens, such as Campylobacter or Yersinia, however a clinical diagnosis can be made based on assessment of patient risk factors and isolation of *Salmonella* from a clinical sample, such as a stool or blood culture.[1] Other rapid diagnostic testing methods, such as NAAT and panel-based molecular diagnostics can also be utilized to distinguish *Salmonella* from other causes.[9]

Although less common, more serious complications of salmonellosis can occur. Bacteremia occurs in approximately 1-4% of immunocompetent patients, but the risk is much higher for younger children, elderly adults, and immunocompromised persons.[1] Vascular complications can occur in 10-25% of adults with bacteremia, which includes seeding of atherosclerotic plaques or aneurysms, or less commonly, venous thrombophlebitis. In addition, bacteremia can lead to localized infections in 5-10% of cases, including meningitis, endocarditis, pneumonia, empyema, abscess formation, osteomyelitis, or septic arthritis.[1] Antibiotics are often indicated in severe hospitalized patients with complications, but can be complicated by rising rates of *Salmonella* resistance in the United States, which limits the viability of early empiric antibiotic therapy in many patients.[3]

Outbreaks

The CDC has several surveillance systems in place for obtaining information about *Salmonella*, including information on the number of outbreaks, antimicrobial-resistant infections, and subtypes (Figure 1).[4] One of the largest outbreaks ever recorded in the United States occurred in 1985, where a strain of *Salmonella*

FIGURE 1. Incidence of New Cases of Salmonella in Wisconsin and United States[11]



Typhimurium in milk was traced back to a dairy farm in Illinois. At that time, over 16,000 people were infected across multiple states, primarily including Illinois, Indiana, Iowa, Michigan, Minnesota, and Wisconsin.[4] There have been no outbreaks of such magnitude since 1985 however, there are frequently smaller outbreaks reported each year. Several recent notable outbreaks have resulted in the presence of multidrug resistant *Salmonella* and the recall of several products.

On October 17th, 2018, the CDC and public health officials investigated a multistate outbreak of *Salmonella* Infantis infections that were linked to raw chicken products.[5] The outbreak resulted in 92 reported cases of *Salmonella* across 29 states, leading to 21 hospitalizations.[5] Although the outbreak strain was identified in samples taken from raw chicken pet food, raw chicken products, and live chickens, no single common supplier was identified as a source.[5] An analysis of isolates from 43 ill people and 68 samples found predicted resistance to a variety of generic antibiotics, including: ampicillin, ceftriaxone, chloramphenicol, ciprofloxacin, fosfomycin, gentamicin, tetracycline, and trimethoprim-sulfamethoxazole.[5]

More recently, as of November 5th, 2018, an outbreak of *Salmonella* Reading was reported in 35 states, resulting in 164 reported cases, 63 hospitalizations, and 1 death.[5] Epidemiologic and laboratory evidence linked the outbreak to raw turkey, which resulted in a recall of over 90,000 pounds of raw ground turkey products by Jennie-O Turkey® Store Sales in Barron, Wisconsin.[5] Similarly, on October 4th, 2018, another *Salmonella* outbreak was linked to contaminated beef products sold from JBS Tolleson, Inc., of Tolleson, Arizona. This outbreak resulted in almost 7 million pounds of beef product being recalled due to 246 reported cases across 25 states and 59 hospitalizations.[5] Although there were very few deaths reported in these instances, it is important to be aware of the proper prevention and treatment strategies when symptoms are recognized and suspected of a *Salmonella* infection.

Treatment

Non-typhoidal *Salmonella* (NTS) infection can manifest as either enterocolitis with diarrhea or as an invasive disease.[6] Treatment for NTS gastroenteritis primarily consists of supportive therapy including fluid and electrolyte replacement.[7] Antibiotics are not indicated for nontoxic immunocompetent patients with NTS gastroenteritis due to the self-limiting nature of the infection. A Cochrane Review including 12 trials and 767 participants detected no difference in duration or severity of illness and a higher number of adverse events among participants who received antibiotics.[6] Furthermore, some studies note that antibiotic use may actually prolong *Salmonella* shedding.[6,8]

The patient populations where antibiotics are recommended in addition to supportive management include neonates, adults at least 50 years of age with a history of atherosclerosis, immunosuppression, cardiac disease, significant joint disease, incapacitating diarrhea, hospitalization, or patients with severe disease, defined as 8 or more loose stools per day.[7-9] Extraintestinal manifestations occur most often in immunocompromised individuals

and can affect the meninges, bone, kidneys, lungs, joints, heart, and adrenal gland.[6] For severe disease, first line therapy is ceftriaxone 1-2g intravenous (IV) every 24 hours.[7-9] Alternative antibiotic options include ciprofloxacin, azithromycin, and sulfamethoxazole-trimethoprim. In the case of bacteremia, IV antibiotics are the mainstay of therapy with ceftriaxone as the preferred option. Recommended duration of antimicrobial therapy is 3-7 days for immunocompetent patients without bacteremia and 7-10 days for bacteremia. For extraintestinal infections, antibiotic therapy is usually prolonged and may require surgical resection or drainage to eradicate the infection.[7] Duration of therapy in immunocompromised patients can vary greatly and is usually greater than fourteen days.

A recent challenge to the treatment of these infections is the global increase in antibiotic resistant NTS, including resistance to fluoroquinolone and third generation cephalosporin.[8] Resistant strains result from the use of antimicrobial agents in food animals and the transmission to humans through the food supply.10 Susceptibility testing is encouraged for invasive NTS infections and bacteremias.[8]

Prevention

The most important way to decrease salmonellosis outbreaks is to emphasize prevention. Prevention and control of salmonellosis requires identification and removal of controllable hazards and the recognition of foodborne outbreaks.[7] NTS is primarily transmitted via the fecal-oral route; therefore, various infection control measures are aimed at increasing sanitation and hygiene. To limit the risk of healthcare–associated transmission, health care personnel should use personal protective equipment when performing direct patient care or handling soiled articles. Appropriate and timely laboratory tests and prompt reporting of positive cultures to local public health departments are a very important way healthcare systems can contribute to controlling outbreaks. Healthcare providers should also provide counseling and education to the public, specifically targeting patient populations at increased risk for complications including immunocompromised, pregnant women, and the elderly.[9] For preventing the transmission in a non-health care setting, good personal hygiene and adhering to standards for safe food handling are also an important and cost-effective approach to controlling salmonellosis.[7] Routine screening for asymptomatic carriage of NTS is not recommended but is sometimes performed for food handlers who are symptomatic. Since animals are a major reservoir of NTS infections, vaccination of feed animals and reducing antibiotics as growth promoters are important in declining incidence as well as controlling resistant salmonellosis.[6,8] Prevention strategies for the community emphasize personal hygiene, specifically hand hygiene after using the toilet, changing diapers, before and after preparing food, before eating, after handling garbage or laundry.[9] It is important that consumers also avoid consumption of raw or undercooked eggs or poultry and use pasteurized eggs whenever possible.[7] Because of the adverse health consequences associated with the increasing incidence of antimicrobial-resistant salmonellosis, there is a need to emphasize non-antimicrobial infection control strategies, such as improved sanitation and hygiene, in the public.[10]

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

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Danielle Womack, MPH, Erica Martin, and Megan Grant
Pharmacy Society of Wisconsin, Madison

Danielle Womack and Erica Martin rose in comedy scene with their viral mini web-series, "Danielle and Erica Telling Some Jokes." The series is hosted on the Pharmacy Society of Wisconsin's YouTube page. The theme song for the series, written and performed by Megan Grant, has received some buzz for various best original song awards. "We specialize in the genre of 'dad jokes'," said Womack. Their best-known episode, titled "Don't Let Your Membership Expire," highlights the benefits of PSW membership through dinosaur and pre-historic puns. Womack stars as a dinosaur cowboy and Martin as a tyrannosaurus rex. "Personifying a dinosaur really challenged my acting skills. We hope the critics favor this come awards season," said Martin. Womack added, "We think this episode put us on the road to earning the EGOT (Emmy, Grammy, Oscar, Tony) acclamations." While Danielle and Erica rarely host live events, you can meet the comedians, and Grant, at any PSW conference. All three are staff members of PSW. "Comedy is our second love, but advancing pharmacy practice is our first," said the trio.

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Realizing I had no hobbies after finishing pharmacy school and residency, I was inspired to take my first improv class in 2003. Since then I've been a performer at ComedySportz Milwaukee, part of comedic theater productions in the Milwaukee area, and a founding member of the sketch comedy group, Broadminded. I also teach communication and teamwork skills to students at CUWSOP using applied improvisation. We focus on skills essential to clinical and interpersonal communication in pharmacy practice. For me, comedy has served as a creative outlet, a source for teaching innovation, and brought me much joy and laughter. (Photo credit: David Lauersdorf)

PRECEPTOR SERIES:

Considerations Associated with Preceptor Burnout

by Gretchen Kunze, PharmD, BCPS, Melissa Theesfeld, PharmD

Professional burnout, although not a new concept, continues to be a hot topic of conversation among health care workers. While most research has been focused on burnout in physicians and nurses, more attention is being placed on this syndrome within the practice of pharmacy. A study conducted by the American Pharmacists Association (APhA) in 2010 found that more than fifty percent of pharmacists were burned out, including pharmacists across different practice settings and in various stages of their careers.[1] Increased workload and responsibilities, coupled with less support and time, are significant factors leading to pharmacist burnout.[2] In addition, lack of control in the workplace, as well as inconsistencies between skill sets and actual day-to-day tasks are contributing factors to burnout.[1,2] The consequences of burned out practitioners are substantial and include feelings of indifference towards quality of work and increased medication errors, both of which can lead to decreased patient safety.[3] Not often considered, is the additional energy and work associated with being a pharmacy preceptor and how mental fatigue in this role may factor into burnout overall.

Why Do Preceptors Experience Burnout?

For many pharmacy practices, students and residents are an essential part of being able to maintain an efficient workflow and provide progressive clinical services. We depend on their contributions as much as they rely on us to teach them new knowledge and skills that will prepare them for a successful future. Unfortunately, the daily demands of practicing pharmacy are increasingly high and complex, can take priority over our learners, and may overshadow our intentions and abilities to provide meaningful educational experiences. In addition, the role of pharmacy preceptor is becoming more involved. As our health care system continues to evolve, schools of pharmacy and residency training programs are forced to adjust their curriculums and expectations to meet the educational standards put in place by accrediting organizations. Learners are being evaluated on several different

requirements, all of which demand significant time and planning by preceptors to create quality activities and experiences during rotations. Evaluations for learners have also become quite lengthy, occur frequently, and take a lot of thought and effort to provide constructive feedback.

Furthermore, precepting is not a one size fits all model. Balancing multiple learners, at different levels of education and experience, and from several institutions can be overwhelming. There can be vast differences among students regarding their interpersonal skills, learning styles, baseline knowledge, professional experiences, and level of motivation, just to name a few. These differences can be challenging to juggle and often force us to adjust our precepting style to accommodate each individual learner. In addition, learners are coming into their rotations more knowledgeable than ever. They are fresh from training about the latest guidelines and the newest of therapies. As time passes and it becomes more difficult to keep up with new developments in practice, preceptors may find themselves doubting or questioning their ability to teach the next generation of pharmacists. However, we should never underestimate the value of our experiences as a professional. Some may argue that being rich in experience goes much further than being rich in knowledge. In the end, we should view these hurdles as opportunities for professional and personal growth.

How Do I know if I am Experiencing Burnout?

An objective way to determine if you are on the path to burnout is by taking a validated survey. The Maslach Burnout Inventory (MBI) has been used since the 1980s to evaluate the severity of burnout syndrome.[3,4] There are multiple versions of the MBI, including the MBI-Human Services Survey for Medical Personnel and the MBI-Educators Survey (MBI-ES).[3,4] Given that pharmacy preceptors are an extension of the pharmacy school curriculum and post-graduate residency training, it may be appropriate to apply the MBI-ES survey and its results to these pharmacists. The MBI asks participants to respond using a frequency rating scale (never, a few times a year or less, once a month or less, a few times a month, once a week, a few times a week, every day) to measure emotional exhaustion, depersonalization, and sense of personal accomplishment.[4] There is a cost associated with all of the MBI assessments, but they are generally considered to be the gold standard for measuring burnout.[3,4] In 2017, the National Academy of Medicine launched the Action Collaborative on Clinician Well-Being and Resilience.[5] This network of more than 180 organizations, including APhA and American Society of Health-System Pharmacists (ASHP), is working to improve awareness of and solutions for burnout for all clinicians, including doctors, nurses, pharmacists, dentists, trainees, and others.[5] The Clinician Well-Being Knowledge Hub provides a wealth of research, resources, and tools for clinician use.[5]

How Can Preceptors Manage Burnout?

Like many things, the best solution for burnout is to prevent it from occurring in the first place. There are several things we can do as preceptors to offload some of the pressures and challenges we face, while mitigating the symptoms of burnout. Developing your own rotation syllabus can help give structure to each day and facilitate learners' activities to meet rotation requirements. Delegating responsibilities to fellow pharmacists and technician staff gets others engaged in the practice and also allows the learner to consider things from different perspectives. One of the keys to a productive rotation is open and strong communication with your learner starting from day one. Asking learners what their individual goals are can guide their rotation and make it easier to find teachable moments. Set reasonable yet challenging expectations that will align your learners' abilities within your limitations as a preceptor and a pharmacy site. Balancing the focus between offering clinical knowledge and developing life-long skills essential to being a pharmacist will provide a well-rounded experience. Learners don't have to be glued to your side all day long. Building in downtime for the learner will give you time to complete daily tasks.[6] Finally, take advantage of learning opportunities provided through journal articles, professional organization involvement, and continuing education or conference programming focused on preceptors and preceptor development.

Even the most motivated among us are susceptible to burnout. Priorities change, which force us to shift our time and attention to other areas in life. Preceptor burnout can influence our ability to train students effectively. Emotional detachment from precepting responsibilities may lead to setting lower goals and expectations and ultimately depriving learners of potential learning opportunities.[3] Bringing this issue to light will increase our abilities to recognize burnout in ourselves or others and make interventions early. The interdependence between pharmacy sites and learners is not going away and continues to be an opportunity to advance pharmacy practice. We owe it to our students, residents, ourselves, and our profession to address preceptor burnout and take necessary action to correct it.

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What is the Safety of Existing Alternative Infliximab Infusion Protocols with Shorter Infusion Times?

by Nichole Cabral, 2019 PharmD Candidate

Infliximab is a chimeric monoclonal antibody indicated for the use in immune-related diseases, including inflammatory bowel diseases (i.e. Crohn's disease, ulcerative colitis). This antibody binds to tumor necrosis factor alpha (TNF-α) inhibiting the cytokine from binding to receptors on inflammatory cells. The suggested dosing schedule is a 2-3 hour intravenous (IV) infusion at 0, 2, and 6 weeks, then every 8 weeks thereafter.[1,2] Because infliximab is derived from mouse and human IgG1, patients may experience infusion site reactions such as fever, chills, pruritis, rash, and other adverse effects. Therefore, 1-2 hour monitoring is recommended post-infusion. The entire infusion process can take more than 4 hours, consuming large amounts of the patient and medical team's time. Given this limitation, the question posed is: **What is the safety of existing alternative infliximab infusion protocols with shorter infusion times?**

Evidence Summary

Boston Medical Center studied a shortened infusion time in 75 patients receiving >5 mg/kg dose of infliximab to treat inflammatory bowel diseases (IBD).[3] The multidisciplinary team consisting of a gastroenterologists, rheumatologists, and pharmacists developed an administration schedule and monitored adverse effects and efficacy. Each patient was initially infused according to the manufacturer's 2-hour IV infusion with 1-2 hours of post-infusion monitoring for 3 infusions. If the patient did not experience any infusion reactions, then the fourth infusion was administered over 1 hour. If the patient did not experience any infusion reactions during the fourth infusion, then the fifth infusion was administered over 30 minutes. If the patient did not experience any infusion reactions during the fifth infusion, then all future infusions were administered over 30 minutes. A total of 522 infusions were observed, 483 infusions were administered over 1 hour, and 39 infusions progressed to 30 minute infusions. No patients reverted back to the standard 2 hour infusion. Post-infusion monitoring was not required of the center per protocol. Instead, pharmacists called the patients 24 hours post-infusion to discuss any reactions or concerns. No acute or delayed reactions were observed, suggesting safety in an accelerated infusion.

Loss of clinical response is another common concern with maintenance infliximab treatment to achieve remission.[3] The Boston Medical Center study also measured instances of dose intensification (increase in dose or decrease in maintenance dose administration interval) to determine if an increase incidence of loss of clinical response was associated with faster infusion times. Ten subjects (13%) required either a dose escalation or decrease in maintenance interval with a median dose escalation time of 171 days. These results were compared to the landmark trial which established the efficacy of maintenance infliximab infusions, "A Crohn's Disease Clinical Trial Evaluating Infliximab in a New Long-Term Treatment" (ACCENT I).[2] ACCENT I was associated with 28.5% of subjects who required a dose escalation at 54 weeks. Although the study at Boston Medical Center was a small study compared to the ACCENT I trial, the incidence of dose escalation did not appear to differ.[2,3] Since the landmark trials did not use rapid infusion and the dose escalation rates were similar to those reported in rapid infusion protocols, it does not seem that rapid infusion affects efficacy.

Clare et al assessed an accelerated infliximab infusion protocol and identified risk factors that can precipitate an infusion reaction.[4] Patients being treated for various bowel diseases were initiated with four, 2-hour IV infusions followed by 2-hour post monitoring, then five, 1 hour IV infusions, and finally 30 minute IV infusions.[4] Overall, 144 patients were treated with 1,146 infliximab infusions. During the 344 standard infusions, 11 infusions were associated with mild infusion reactions (e.g. nausea, lightheadedness, wheeze, erythematous rash). Standard infusions were resumed after IV hydrocortisone and chlorpheniramine were administered. Four standard infusions were associated with delayed hypersensitivity reactions (e.g. myalgia, polyarthropathy, rash) and 3 standard infusions were associated with severe reactions causing a discontinuation of the infusion. During the 376 1 hour infusions, 13 mild infusion reactions, zero severe reactions, and 1 delayed hypersensitivity reaction occurred. Of the 426 30-minute IV infusions, 8 mild infusion reactions, 2 severe reactions, and zero delayed hypersensitivity reactions occurred. The only variable of note that investigators identified to possibly increase the risk of infusion reactions was episodic administration of infliximab. Otherwise, accelerated infliximab infusions were safe if given regularly.

Studies have also investigated accelerated infusion protocols in pediatrics to determine safety and tolerability in this special population. Rozette et al retrospectively assessed 540 infliximab infusions given over 2-3 hours and prospectively assessed 545 infliximab infusions given over 1 hour at

a freestanding children's hospital.[5] Most of these patients were prescribed infliximab to treat Crohn's disease or ulcerative colitis at doses 5 to 15 mg/kg. Similar to other accelerated infusion studies, patients required at least 2 infliximab standard infusions without experiencing infusion reactions before progressing to 1 hour infusions. There were no statistically significant differences in rates of infusion reactions between the groups. The standard infusion group saw 1 (0.19%) infusion with a reaction compared to 2 (0.36%) infusions in the rapid infusion group. This study also showed premedication was not a factor in decreasing infusion reaction incidence. All patients in the retrospective standard infusion duration group were premedicated with diphenhydramine and acetaminophen, whereas 60% of the prospective shortened infusion duration group who were premedicated only received acetaminophen. A notable limitation of this study was the variable indications. The majority of patients were treated for IBD while the remaining were treated for various autoimmune disorders (i.e. celiac disease, uveitis, juvenile idiopathic arthritis, and Takayasu's arteritis) at varying doses. Additionally, retrospective data were based on chart reviews without specified guidelines. The retrospective design caused fewer than expected patients to be available, thus limiting the statistical power achieved. Despite this limitation, there did not appear to be clinically significant differences between accelerated and standard infusions. This study center deemed accelerated infusions safe in pediatrics and adopted the protocol into current practice.

A large, multicenter, retrospective study assessed frequency and severity of infusion related reactions in pediatric patients treated for inflammatory bowel diseases.[6] Data was collected from infusion centers in Canada and the United states where 4120 60 minute infliximab infusions were given to 453 patients. Unlike other rapid infusion studies, standard 2-3 hour induction infusions were not required

TABLE 1. Infliximab Infusion Schedules for Doses >1000 mg with a Total Volume of 500 mL

Standard Infusion Schedule (> 2 hours)[3]	*Accelerated Infusion Schedule[3,7]*	
	Option A	*Option B*
10 mL/hr x 15 min 20 mL/hr x 15 min 40 mL/hr x 15 min 80mL/hr x 15 min 150 mL/hr x 30 min 250 mL/hr for remainder of infusion	50 mL/hr x 8 minutes 100 mL/hr x 8 minutes 350 mL/hr x 8 minutes 500 mL/hr x 8 minutes 750 mL/hr for remainder of infusion	100 mL/hr x 15 minutes 300 mL/hr for remainder of infusion

for these patients. Nevertheless, the results are similar to the incidence of infusion related reactions in the previously described studies. A total of 22 (0.5%) infusion related reactions occurred in 21 patients. The most common reactions were nausea, headache, and myalgias. Only 1 reaction was considered severe and the remainder were mild. All adverse effects were assumed to be infusion related. Premedication was not associated with infusion related reactions compared to no use of premedication (adjusted RR= 0.61; 95% CI, 0.36-1.03; P=0.06). Additionally, a standard dose, 5 mg/kg, compared to a high dose, 10 mg/kg, did not appear to differ in rate of infusion reaction. Interventions for the mild reactions included monitoring, treatment with acetaminophen, and use of premedication with future infusions. Shorter infusion times appear to be well-tolerated in the pediatric population regardless of premedication use or dose compared to standard infusion times.

Another large, retrospective, multicenter study involving rapid infliximab infusions in pediatric patients was conducted in Jerusalem.[8] Data was collected over 18-26 months across 3 centers treating inflammatory bowel diseases. Subjects were eligible for 1 hour rapid infusions if they received at least 4 standard duration infusions with no infusion reactions, no recent dose increase, and no more than 10 weeks had elapsed since the previous infusion. Premedication was used at the discretion of each center. A historical cohort of standard infusions occurring 5 years prior to the current study was used as a second comparison group. Among 102 children, 8 of 639 (1%) rapid infusions experienced a reaction, compared to 6 of 228 (2%) standard duration infusions, and 21 of 444 (5%) standard duration infusion in the historical cohort. Infusion reactions were described as "none-mild" and "moderate-severe", however, detailed descriptions of the reactions were lacking. Loss of response rates were also assessed. In the rapid infusion group 26 (41%) patients experiencing a loss of response to infliximab therapy compared to 15 (38%) patients receiving standard duration infusions and 21 (51%) patients in the historical cohort. Of note, patients in the historical cohort experienced higher rates of infusion and higher loss of response rates reactions despite greater use of premedication compared to rapid infusions. The investigators believed it may be due to less aggressive dosing in the past leading to antibody production which resulted in more infusion reactions and lower response rates. Prospective studies documenting dosing, premedication use, and descriptions of infusion reactions will be useful in accurately determining factors related to infusion reactions and loss of response rates in rapid infusions.

Evidence-Based Answer

It appears safe to administer infliximab over 1 hour in adults being treated for IBD. Table 1 describes standard and accelerated infusion schedules for an adult receiving a dose greater than 1000 mg with a total volume of 500 mL. Adverse effects seen with accelerated infusions are similar to rates with standard infusion times, however, efficacy should continue to be closely monitored. Current accelerated infusion data show loss of clinical response rates to infliximab requiring dose escalations at similar rates to standard infusion times, thus efficacy does not appear to be affected when accelerated infusions are used. Additional prospective studies identifying factors associated with loss of response are needed to establish the efficacy in adults being treated for IBD and other indications to further generalize the use of accelerated infusions. In terms of the pediatric population, limited data are available and more research is needed in this population as well. Many centers in Europe have employed accelerated infliximab infusion protocols, but only few centers in the United States have followed suit. Accelerated infliximab infusions have the potential to improve patient quality of life and efficiently use infusion center resources.

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

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

Management of Bleeding Associated with the Use of Brodifacoum Tainted Synthetic Cannabinoids

by Francisca Ikhumhen, 2020 PharmD Candidate, Nichole Gervenak, 2020 PharmD Candidate, Rong Tang, 2020 PharmD Candidate

Synthetic cannabinoids are chemically synthesized analogs of natural marijuana that contain numerous psychoactive and potentially harmful compounds.[1] Synthetic cannabinoids are recognized under various names such as spice, genie, K2, sence, moon rocks, black mamba, kush, fake marijuana and others.[2,3] Use of synthetic cannabinoids is appealing for pleasure seekers because it causes a "high" similar to tetrahydrocannabinol (THC), is undetectable in a urine drug screen and is regarded as an alternative to marijuana.[4] It is readily available in abundant quantities and labeled with subtle names such as "for aromatherapy" or "incense" that can be deceptive to users.[2,5]

The chemical composition of synthetic cannabinoids is constantly changing and may include other psychoactive ingredients. Mu-opioid agonists and many other miscellaneous chemicals that may have cannabinoid-like, monoamine oxidase inhibitor (MAOI), or hypnotic/anxiolytic activity have been found in these products.[6] There have been reported cases of myocardial infarction, serious seizures and most recently, unexplained bleeding due to the use of contaminated synthetic cannabinoids.[2,6,7] Some cases involve accidental ingestion or suicide attempts in patients with mental health disorders.[8,9]

The Food and Drug Administration (FDA) released a press statement in July 2018 warning about the significant health risk associated with contaminated illegal cannabinoid products.[10] As of May 2018, the Illinois Department of Public Health (IDPH), reported 164 cases in Illinois, including 4 deaths, of severe bleeding among people who have used contaminated synthetic cannabinoids.[11] In Wisconsin, 15 cases have reported to the Wisconsin Department of Health Services (DHS) since March 2018, with 7 confirmed and 8 probable cases.[12] The purpose of this article is to increase pharmacists' awareness of the potential toxicities and harm associated with the use of synthetic cannabinoids and to understand the acute and subacute management of these patients.

Brodifacoum

Synthetic cannabinoids are often contaminated with brodifacoum.[3] Brodifacoum is thought to prolong or increase the "high" effect of synthetic cannabinoid.[13] Brodifacoum falls under the class of long acting anticoagulant rodenticide (LAAR) compounds sometimes called "superwarfarins." These compounds were developed in response to warfarin resistance in the rat population in the 1970s.[7] LAARs are highly lipophilic, 100-fold more potent than warfarin, undergo enterohepatic circulation and have a more rapid onset of action.[8] Brodifacoum is the most commonly used rodenticide and has a mechanism of action similar to warfarin. It prevents the carboxylation of the vitamin K – dependent coagulation factors II, VII, IX and X into their active procoagulant form.[7] The elimination half-life of brodicafoum ranges from 16 to 34 days, compared with 17 to 37 hours for warfarin.[9] The anticoagulant effects of brodifacoum has been reported to last from 51 days and in some cases up to 9 months after ingestion.[9,14]

Brodifacoum toxicity is a significant concern because its effect can be present without significant serum concentrations.[9] In most reported cases, neither patients nor clinicians were aware of the brodifacoum concentration in the ingested products.[5] The onset of anticoagulation effects after acute ingestion range from 8 to 48 hours and clinical presentation can be unremarkable during the first twelve hours post-ingestion.[9,14] Laboratory evidence of coagulopathy occurs within one to two days after ingestion and physical evidence of coagulopathy can be delayed for several days to weeks. If untreated, anticoagulation may continue for months.[9]

Based on published case reports, the clinical presentation of toxicity can range from asymptomatic to active bleeding from any mucosal site or organ, gingival bleeding, epistaxis, ecchymosis, gastrointestinal bleeding, hemoptysis, hematuria, and intracranial bleeding.[9,13,14] One case of a 46-year-old female presented with gastric hemorrhage and severe coagulopathy, prolonged prothrombin time (PT) and partial thromboplastin time (PTT) both greater than 110 seconds. Her serum level of brodifacoum was markedly elevated at 1302 ng/mL.[8] Another case of a 36-year-old male presented with low back pain, hematuria, hematemesis, and melena. His initial laboratory test results included an international normalized ratio (INR) > 9, PTT of 102 seconds and prolonged PT greater than 130.[7] Laboratory results that can indicate brodifacoum toxicity includes the presence of markedly elevated INR, prolonged PT and PTT, presence of brodifacoum in serum using high performance liquid chromatography (HPLC), followed by the demonstration of specific deficiency of vitamin K-dependent blood coagulation proteins.[8,15,16]

Acute Management of Toxicity

There are no guideline recommendations for the management of bleeding in brodifacoum toxicity. Contact with local Department of Public Health and poison control center is necessary when brodifacoum poisoning is suspected.[3] If brodifacoum exposure is suspected or known, the patient should be evaluated for bleeding symptoms and coagulation assay abnormalities.[13] If no clinical abnormalities are present after 48 hours, patients should be on continued observation without treatment.[14]

If clinically major bleeding is present, vitamin K1 10 mg should be administered intravenously in conjunction with prothrombin complex concentrate (PCC) or fresh frozen plasma (FFP).[8] The dose of PCC or FFP administered is not consistent among case reports and often based on presenting symptoms and INR. Initial doses of FFP administered in case reports ranged from 2 to 6 units.[13] There is little evidence to support the use of recombinant factor VIIa for this indication.[15] Intravenous vitamin K1 is preferred due to its rapid effect when bleeding is present and urgent intervention is required. Although, there is a risk of anaphylaxis, this has been mitigated in modern preparations, appropriate monitoring for anaphylaxis reactions and diluted administration over 30 minutes.[14,15]

Once serious bleeding is controlled, intravenous vitamin K1 can be switched to the oral formulation.[5,8,17] There is the concern of hematoma with intramuscular administration of vitamin K1, therefore, oral is the preferred route.[13] The dosing of oral vitamin K1 is dependent on the duration of action rather than the half-lives of the clotting factors.[5] Vitamin K1 has a long duration of action, reported at greater than 168 hours in warfarin-treated patients, but very little is known about the kinetics of vitamin K1 in brodifacoum toxicity.[5] The initial dose of vitamin K1 in reported cases of brodifacoum toxicity varies with doses ranging from 10 mg to 420 mg per day.[5,8,13] Patients may require multiple dose adjustment of vitamin K1 before achievement of a therapeutic dose.[13]

Due to the enterohepatic recycling and long half-life of brodifacoum, there may be rebound bleeding issues in patients with brodifacoum toxicity.[8] Maintenance therapy with vitamin K1 is continued for extended durations after an injestion.[13] Maintenance dosing from case reports ranges from 15 to 600 mg daily with 100 mg daily being the most common dosage.[13] Long term use of oral vitamin K1 is often tapered over weeks or months based on coagulation parameters like INR and PT.[7] If available, serial measurement of brodifacoum levels may be useful in projecting duration of oral vitamin

K1 therapy.[17] Of note, brodifacoum assumes a zero-order kinetics at higher concentrations and then switches to first-order kinetics as levels decrease.[8,9,13] Information from previous cases show no brodifacoum induced coagulopathy when serum brodifacoum levels fall below 10 ng/mL and 4 ng/mL. At these levels, discontinuation of vitamin K1 therapy can be trialed.[5,13,17] It is important to note that coagulation anomalies may persist even if serum brodifacoum levels are undetectable.[13] Use of phenobarbital has been proposed to enhance brodifacoum hepatic metabolism, but its use has not been shown to improve survival rates or recovery of coagulation factors in brodifacoum poisoning.[8]

Frequent monitoring of a patient's INR is necessary to establish the maintenance dose of vitamin K1.[3,13] INR should be checked at least every day. If INR is > 2.5 twenty-four hours after the start of vitamin K1, doses should be increased.[3] Once INR has been < 2.5 for at least forty-eight hours the patient may be discharged on that dose of vitamin K1. INR should be checked two to three days after the patient is discharged or after any change in vitamin K1 dose.[3] Once INR is stable (≤ 1.3), INR check should be repeated every two weeks.[3,9] If the INR stays stable, consider initiating a slow taper of the vitamin K1 dose with close monitoring of INR every two to three days. If the INR increases but stays < 2.5, maintain the vitamin K1 dose, and if the INR increases > 2.5 return to previous higher dose of vitamin K1.[3,15] Typically treatment can extend from 3 to 6 months and sometimes more than a year.[15] Patients should be informed of the potential for long term vitamin K1 therapy as this may influence compliance.[3,7]

Outpatient Considerations

A 2016 report from the Wisconsin Department of Health Services (WDHS) stated that 250,000 citizens of Wisconsin were uninsured in the year of 2016.[18] A substantial issue with synthetic cannabinoid being laced with brodifacoum is the expense of the treatment. Oral therapy of vitamin K1 100 – 200 mg per day may need to be continued for many months.[19] To battle costs of treatment in Illinois, free supplies of vitamin K1 was given with valid prescriptions until treatment was completed.[11]

Pharmacists should determine if patients have valid prescription insurance that will pay for the entire treatment course needed for vitamin K1 therapy prior to discharge. It is recommended that patients covered by state Medicaid insurance plans have all prior authorizations recorded before discharge and/or patients eligible should be enrolled in the their particular state's Medicaid program before leaving the hospital to ensure coverage.[19] If no insurance coverage is possible, the WDHS recommends checking qualification for the Valeant pharmaceuticals insurance discount program.[20] Other available federally qualified health center or hospital medication assistance programs can be employed to help patients continue their vitamin K1 therapy if the patient does not qualify for the Valeant discount program.

It is critical that this therapy goes uninterrupted and patients are educated on proper medication refilling procedures. Treatment for hypercoagulopathy caused by brodifacoum may last for up to a year or longer.[7] Therefore, it remains critical to educate at every refill about the signs and symptoms of bleeding: decreased bruising time, blood in the urine or stool, extreme dizziness or fatigue. Additionally, frequent prothrombin time labs are needed to direct the course of vitamin K treatment and not brodifacoum blood concentration alone due to increased bleeding risk even without traces of brodifacoum in the body.[7] Patients should call their pharmacies five days before their medication runs out to ensure that there is enough vitamin K1 on hand and to order more if needed. Pharmacist should follow up with patients to ensure they are getting their refills as needed due to the risks associated with treatment interruption.[7] In addition, patients should be advised that over the counter (OTC) dietary supplements containing vitamin K1 only contain 100 mcg (0.1 mg) and are not an effective treatment for this coagulopathy.[11]

One of the causes for synthetic cannabinoid/brodifacoum poisoning is suicide attempt.[2,3] Patients need to be assessed for suicidal ideation or tendencies prior to discharge so that they can get necessary help. A very easy tool to use for this is the Colombia - Suicide Severity Rating Scale (C-SSRS) screening.[21] It has a minimum of three questions identifying thoughts, plans, or attempts of suicide. Knowing how to ask these questions and how to actively assist and arrange to help patients is vital to ensure that patients with brodifacoum toxicity with risks of suicide are properly evaluated and re-exposure is avoided.[21]

Conclusion

Synthetic cannabinoid tainted with brodifacoum poses a significant health risk. Although it appeals to pleasure seekers, it can lead to potentially fatal events when consumed. Patients with suspected or known ingestion should be monitored for signs of bleeding prior to discharge. In patients presenting with unexplained bleeding, brodifacoum toxicity should not be ruled out and immediate strategies to mitigate bleeding should be initiated. Affected patients need long-term vitamin K1 therapy until monitoring parameters are within normal limit. Compliance to the vitamin K1 regimen and follow-up should be emphasized to prevent re-admission or risk of mortality. Pharmacists should work with patients and other healthcare providers to ensure that patients have continuous access to vitamin K1 therapy. In situations where toxicity is as a result of suicidal tendencies, patients involved should be appropriately evaluated and triaged to avoid re-exposure.

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Pharmacy Society of Wisconsin

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Original Work

Expanding the Roles of Certified Pharmacy Technicians in the Setting of Anticoagulation: Addressing In-Range INRs for Stable Patients

by Brandon M. Dautermann, PharmD ,Stephanie L. Antony, CPhT

Abstract

Objective: The primary objective was to develop and implement an anticoagulation (AC) clinic guideline for certified pharmacy technicians (CPhT) management of patients on stable doses of warfarin. The secondary objectives were to obtain 100% AC clinician approval of CPhT warfarin therapy plans and to observe improvement in time to complete a CPhT-patient encounter comparable to the AC clinician's management of the stable patient population.

Methods: One CPhT was paired with one AC clinician to complete an initial training period and allow for verification of patient encounter accuracy. The CPhT identified stable patients with in-range INRs and completed an encounter comprised of a chart review, patient phone interview, and finalizing a therapy plan with warfarin dosing and appropriate frequency of INR monitoring. The AC clinician reviewed the accuracy and appropriateness of the CPhT plan. The CPhT-patient encounter data was collected for a three month period.

Results: The CPhT was able to utilize an AC clinic guideline for management of patients on stable doses of warfarin to complete 56% of the eligible patient encounters in addition to their usual daily responsibilities. All of the completed encounters were deemed appropriate by the AC clinician verification. The weekly average of time to complete encounters showed a steady decline over the data collection period, which pointed to improved CPhT efficiency.

Conclusions: The CPhT was able to provide appropriate warfarin management of stable patients with in-range INRs without sacrificing the ability to complete their usual clinic responsibilities. This allowed for an enhanced AC clinician focus on the most complex patient populations.

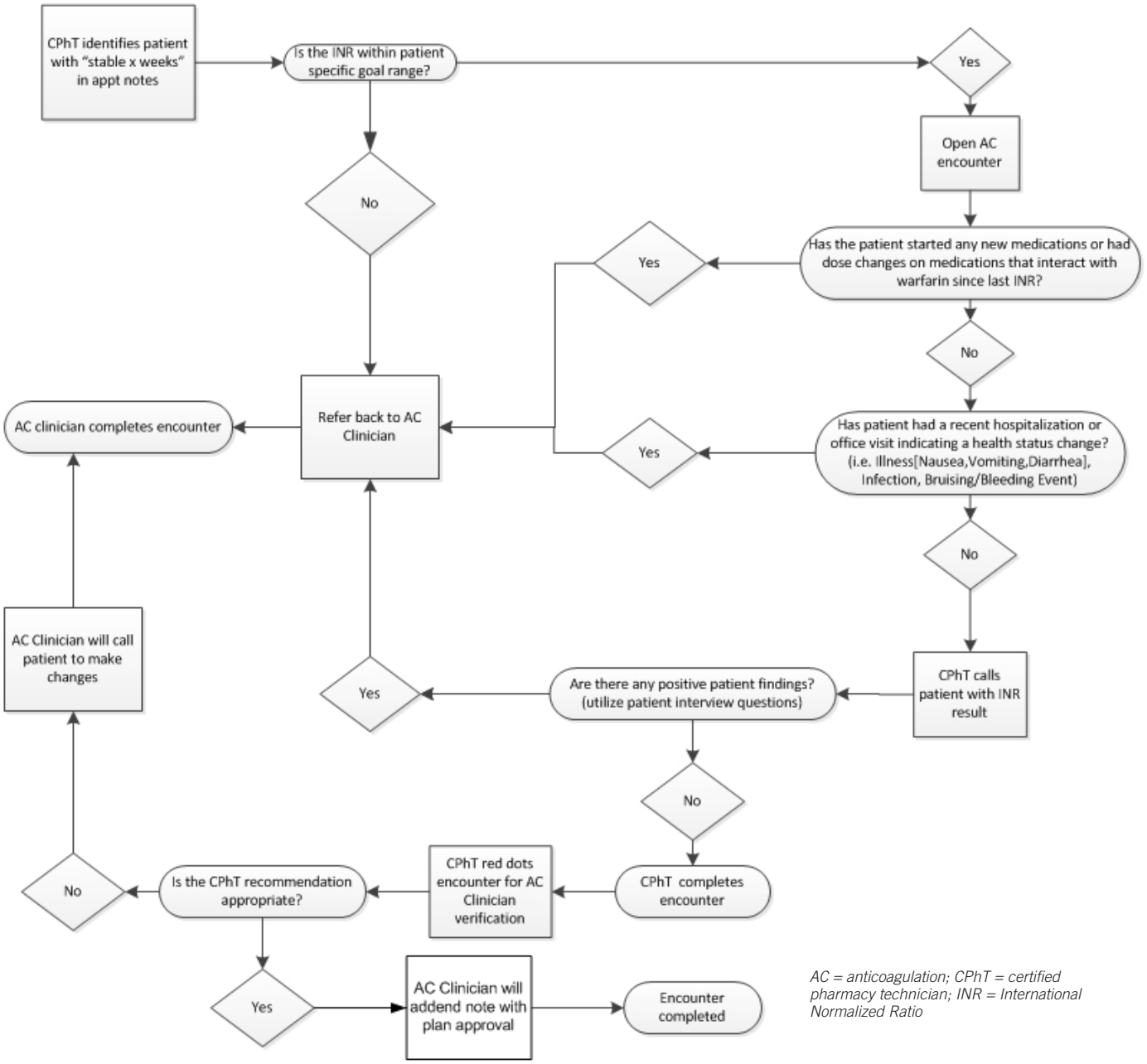
Anticoagulation management of warfarin is a complex process that involves monitoring many factors that can alter the medication's safety and effectiveness, such as patient adherence to the appropriate dosing regimen, dietary vitamin K intake, drug-drug interactions, and patient health status changes.[1] Numerous studies have shown that pharmacy-led anticoagulation (AC) clinic management of warfarin patients leads to improved time in therapeutic International Normalized Ratio (INR) range and lower rates of bleeding and thromboembolic events when compared to management by a physician.[2,3] These improved outcomes lead to significant cost savings in direct anticoagulation care cost, as well as savings from lower rates of hospital admissions/ER visits.[4]

Due to the intensive monitoring required by AC clinicians (pharmacists and nurses) to provide safe and effective patient care, time constraints can become a barrier to maximizing patient outcomes. Previous studies have examined whether appropriately trained, certified pharmacy technicians (CPhT), may be able to perform tasks that have been typically reserved for AC clinicians.[5,6]

A pharmacy-managed inpatient study of the warfarin dosing service at Burnaby Hospital in British Columbia, examined whether appropriately trained clinical pharmacy support assistants (CPSA) could accurately obtain patient data collection and provide appropriate dosing recommendations in an acceptable time frame in order to be considered cost-neutral compared to the work of the AC clinician.[5] In this small study of 60 patient encounters, it was determined that the CPSAs obtained accurate data collection and provided appropriate dosing recommendations when compared to the clinical pharmacists. The time to complete an encounter was longer with the CPSA than the clinical pharmacist, but the times did decline over the course of the study, which reflected the probability of improved efficiency with more experience.

The Veterans Affairs (VA) System also investigated what proportion of the AC clinic workload could be completed by appropriately trained pharmacy technicians, including some tasks which were typically reserved for pharmacists.[6] It was determined that pharmacy technicians could conduct interviews for patients

FIGURE 1. CPhT Encounter Process



AC = anticoagulation; CPhT = certified pharmacy technician; INR = International Normalized Ratio

with in-range INRs. It was decided that if clinical questions arose during the patient interviews (i.e., food and drug interactions), the questions should be routed to an available AC clinician. The advanced-practice pharmacy technicians were able to complete 41% of the clinic workload compared to 21% of the workload handled by pharmacy technicians without advanced training, which allowed for enhanced AC clinician focus on the more complicated patients.

The positive findings identified in these studies led the SSM Health Dean Medical Group AC Clinic to begin incorporating these enhanced CPhT responsibilities into the workflow to determine if these principles could translate to clinic success on a larger scale. SSM Health operates as an integrated delivery network whereby a medical group, hospital system, and health plan work cooperatively to provide quality care. This collaborative environment offers unique challenges and opportunities for providing services across the care continuum. The medical director for the AC Department attends monthly project meetings, presents case studies and relevant research to the staff, and consults on difficult-to-manage patients. The clinic operates under a collaborative care agreement and a series of evidence-based guidelines and protocols that are reviewed and signed by the medical director. The AC Clinic is currently comprised of 10 AC clinicians (five pharmacists and five nurses)

FIGURE 2. Patient Interview Questions

Is the current warfarin strength/dose correct?

Have you had any missed/extra doses?

Have you experienced any bruising/bleeding concerns (nose bleeds, red/black stool, blood in urine)?

Have you had a change in dietary vitamin K intake (green veggies, vitamins, supplement shakes)?

Have you experienced any recent illness/diarrhea/vomiting?

Have you had any prescription/OTC medication changes (TMP/Sulfa, metronidazole, fluconazole, amiodarone, dicloxacillin, rifampin)?

Are you scheduled for any upcoming procedures/surgeries?

OTC – over the counter; TMP/Sulfa = trimethoprim/sulfamethoxazole

that manage approximately 5,000 patients on warfarin. The patients are split into pods that are assigned to each AC clinician to improve continuity of care. There are also 3 CPhTs that participate in various non-clinical responsibilities throughout the clinic. By providing enhanced training to these technicians, the aim was to duplicate the positive findings in the previous studies to advance the roles of our CPhTs and to allow for increased AC clinician focus on the most complex patients in an effort to maximize patient outcomes. The primary objective was to develop and implement an AC clinic guideline for CPhT management of patients on stable doses of warfarin. The secondary objectives were to obtain 100% AC clinician approval of CPhT warfarin therapy plans and to observe improvement in time to complete a CPhT-patient encounter comparable to the AC clinician's management of the stable patient population.

Methods

Patient Selection Criteria

The AC clinicians were responsible for determining which patients could be deemed stable for a CPhT-patient encounter. A patient could be considered stable if they had been on the same warfarin dose for greater than 6 months and had remained consistently within their INR goal range. The AC clinicians then documented in the daily appointment notes that the patient was stable, which identified them as eligible for inclusion in the CPhT encounters. The patient was only eligible for inclusion in a CPhT encounter if they were within their INR goal range. The fluidity of a patient's health status

TABLE 1. Stable Patient Encounter Data

Encounter Type	*Totals*
Eligible Stable Patient Encounters	148
CPhT Completed Encounters	83
AC Clinician Approved Encounters	83
Encounters Referred Back to AC Clinician	0
Encounters Altered by AC Clinician	0

AC = anticoagulation; CPhT = certified pharmacy technician

necessitated continued reassessment of their stability with each subsequent encounter. If a stable patient had an out-of-range INR, the AC clinician completed the encounter and then determined whether their stable status needed to be removed based on the cause of the out-of-range result. If a patient who was considered stable had an isolated out-of-range INR due to an identifiable cause such as a procedural warfarin hold, the patient could maintain their stable status as long as subsequent INRs remained within their INR goal range.

CPhT Training Requirement

The CPhT was paired with an AC clinician for the initial training period, which included education on the use of appropriate prescription and natural medicine reference materials and dietary vitamin K resources. The CPhT was instructed in proper patient chart review to identify pertinent information that might signify a patient health status change or medication additions/changes, which could warrant warfarin dosing adjustments. There was an initial shadowing period where the CPhT observed the AC clinician throughout the entire process of completing patient encounters, followed by CPhT completion of encounters under the direct supervision of the AC clinician to ensure the encounter process (Figure 1) was completed in its entirety.

CPhT INR Encounter Process

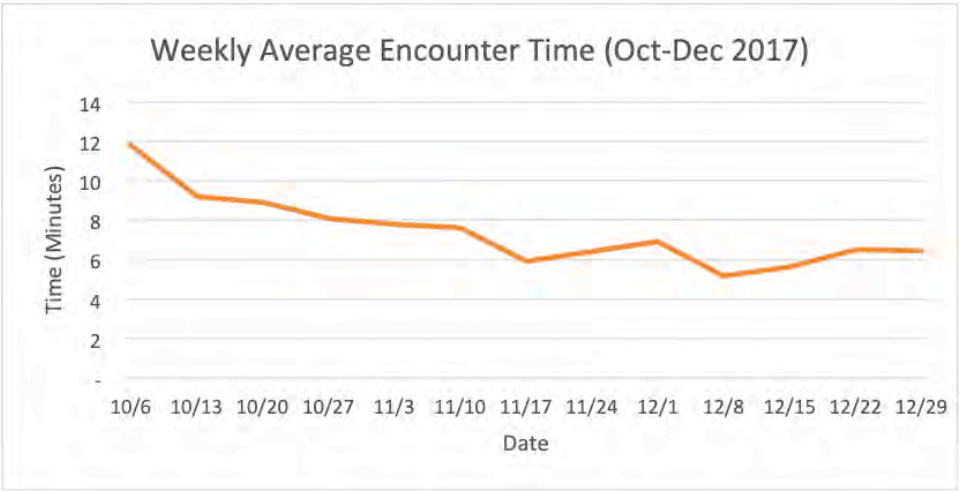
In the initial pilot phase of the program, one CPhT was paired with one AC clinician for training and verification of the accuracy of the patient encounters. When the CPhT identified a stable patient that was within their INR goal range, they began a chart review prior to the phone interview portion of the encounter. The chart review was used to identify any potential change in medications that might cause an interaction with warfarin, or a recent hospitalization/office visit that indicated a significant change in health status. The CPhT utilized a pre-made list of significant drug interactions, as well as drug reference interaction checkers to flag potentially concerning medications. Positive findings in regards to drug interactions or health changes required routing back to the AC clinician for completion of the encounter. If there were no positive findings identified, the CPhT proceeded to the phone interview portion of the encounter. During the phone interview, the CPhT utilized patient interview questions (Figure 2) to identify any other positive findings that might require an intervention by the AC Clinician. If no further positive findings were identified, the CPhT continued the patient's current warfarin dosing and provided them with their next INR date based on the patient's historical testing frequency. The AC clinician finalized the encounter by documenting that the plan had been reviewed and was appropriate

FIGURE 3. CPhT Usual Daily Responsibilities

1. **Answer incoming clinic phone calls**
2. **Schedule/Reschedule patient INR appointments**
3. **Receive and process new patient referrals**
4. **Provide reminder calls to patients that are overdue for INR monitoring**
5. **Receive INR results and alert the appropriate AC clinician**
6. **Pend warfarin refill requests for AC clinician approval**
7. **Route patient and provider messages to AC clinician**
8. **Enter INR lab orders (internal electronic orders or faxed outside clinic orders)**
9. **Facilitate communication of warfarin orders (via electronic health record) to SSM clinic pharmacy med box program**
10. **Initiate and finalize completion of home INR monitoring applications for patients**

AC = anticoagulation; CPhT = certified pharmacy technician; INR = International Normalized Ratio

FIGURE 4. Average CPhT Encounter Time



for the patient based on the information gathered through the thorough chart review and phone interview.

Results

Primary Objective

Following a training period with an AC clinician, the CPhT was able to utilize a standard AC clinic guideline to complete a thorough patient chart review and phone interview. Then, the CPhT was able to provide an appropriate warfarin therapy plan for a stable patient, confirmed by AC clinician encounter verification. The average time required for the AC clinician to complete final encounter verification was 45 seconds, which demonstrated a minimal time commitment.

Secondary Objectives

For the initial pilot phase of one CPhT to one AC clinician, encounter data was collected for a three month period (Table 1). There were 148 eligible encounters of stable patients that were within their target INR goal range. The CPhT was able to complete 83 of the eligible encounters (56%) in addition to their usual daily responsibilities (Figure 3). All of the completed therapy plans were deemed appropriate in the verification step by the AC clinician, indicating that a high level of patient care was preserved in the CPhT-patient encounters. The remaining 65 encounters were completed by the AC clinician due to CPhT time constraints in completing their usual clinic responsibilities.

The time required to complete an encounter was expected to be initially longer in the early stages, as the CPhT became familiar with the process. The goal was to see a decrease in encounter time as the CPhT became more efficient in the patient encounter process. The weekly average of encounter times was tracked over the same three month data collection period (Figure 4). The AC clinician encounter times for the stable patient population were collected over one clinic day to provide a comparison to the CPhT encounters. The average time for the AC clinician to complete a stable patient encounter was 3 minutes. The average CPhT encounter in week 1 was 11.83 minutes from the start of the chart review process to the completion of the patient call and all necessary charting. As expected, the average showed a steady decline as the CPhT became more efficient in the patient encounter process. From week 6 and beyond, the average time to complete an encounter was consistently between five to seven minutes, which compared favorably to the time necessary for the AC clinician to complete an encounter for a stable patient that is within their therapeutic INR goal range.

Discussion

The positive results obtained in the initial pilot phase of this program bode well for further expansion in our clinic. The CPhT was able to complete a high percentage of eligible patient encounters in a favorable timeframe to allow for completion of their usual technician tasks in addition to the enhanced INR encounter responsibility. Expanding these enhanced responsibilities to our other technicians will allow for a higher number of stable patients to be managed by a CPhT, thereby allocating more time for AC clinicians to focus on our more complex patients. Expanding the management of stable patients to additional pharmacy technicians in our clinic will require continued monitoring of performance to ensure that their plan accuracy and time management meet or exceed the initial positive data obtained in our pilot phase. Future success could potentially lead to a further transformation of the CPhT role by placing a larger emphasis on direct patient management.

Conclusion

Providing enhanced training to certified pharmacy technicians in the setting of anticoagulation can allow for CPhT management of stable warfarin patients. CPhT patient management allows for an advanced technician role in patient care and an enhanced focus on complex patients for the AC clinicians, which helps maintain the quality of care for stable patients and improves the care for the most complex patient populations.

Brandon Dautermann is an Anticoagulation Clinical Pharmacist at SSM Health Dean Medical Group in Madison, WI. Stephanie Antony is a Certified Pharmacy Technician at SSM Health Dean Medical Group in Madison, WI.

Disclosures: The authors declare no real or potential conflicts or financial interest in any product or service mentioned in the manuscript, including grants, equipment, medications, employment, gifts, and honoraria.

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MEDICAL COLLEGE OF WISCONSIN SCHOOL OF PHARMACY WRITING CLUB:

Business Member Spotlight: Froedtert and Medical College of Wisconsin 92nd Street Pharmacy

by Holly Schaack, 2020 PharmD Candidate, Parker Knueppel, 2021 PharmD Candidate, Cassandra Rucks, 2020 PharmD Candidate

Day to Day Practice

Located within the Froedtert Hospital campus at the Milwaukee Regional Medical Center, Froedtert & the Medical College of Wisconsin (Froedtert & MCW) 92nd Street Pharmacy serves a diverse population of patients. As a prominent community pharmacy within the health care system, the pharmacy provides high quality services every day including immunizations and delivering medications to a patient's bedside on hospital discharge.

Pharmacists at the Froedtert & MCW 92nd Street Pharmacy frequently collaborate with providers, acute care and clinic pharmacists, medical assistants, nurses, and a variety of other health care professionals in the Froedtert & MCW community to solve complex treatment problems and provide patients with the best care possible.

Kate Schaafsma, PharmD, is the pharmacy manager at the Froedtert & MCW 92nd Street Pharmacy, and she works closely with the pharmacy's strong leadership team to oversee the pharmacy's daily practice. With nearly 20 pharmacy staff members on any given day, Dr. Schaafsma states "communication is key." Tools such as twice weekly staff huddles and a communication board keep operations running smoothly. In any work setting as busy as the Froedtert & MCW 92nd Street Pharmacy, it could be easy for team members to become drained and shift their focus toward the fast pace and high demand of work flow. However, team members often remind each other to concentrate on the true significance of their work to improve patient health. To keep the work environment light and enjoyable, the team members host regular celebrations and potluck meals. The pharmacy is also very involved in the community. Team members volunteer at events sponsored by a variety of partner organizations. Recent examples include a soup luncheon to fundraise for the United Way, the Greater Milwaukee Heart and Stroke Walk to help raise awareness for heart health, and offering influenza vaccine clinics at local food pantries.

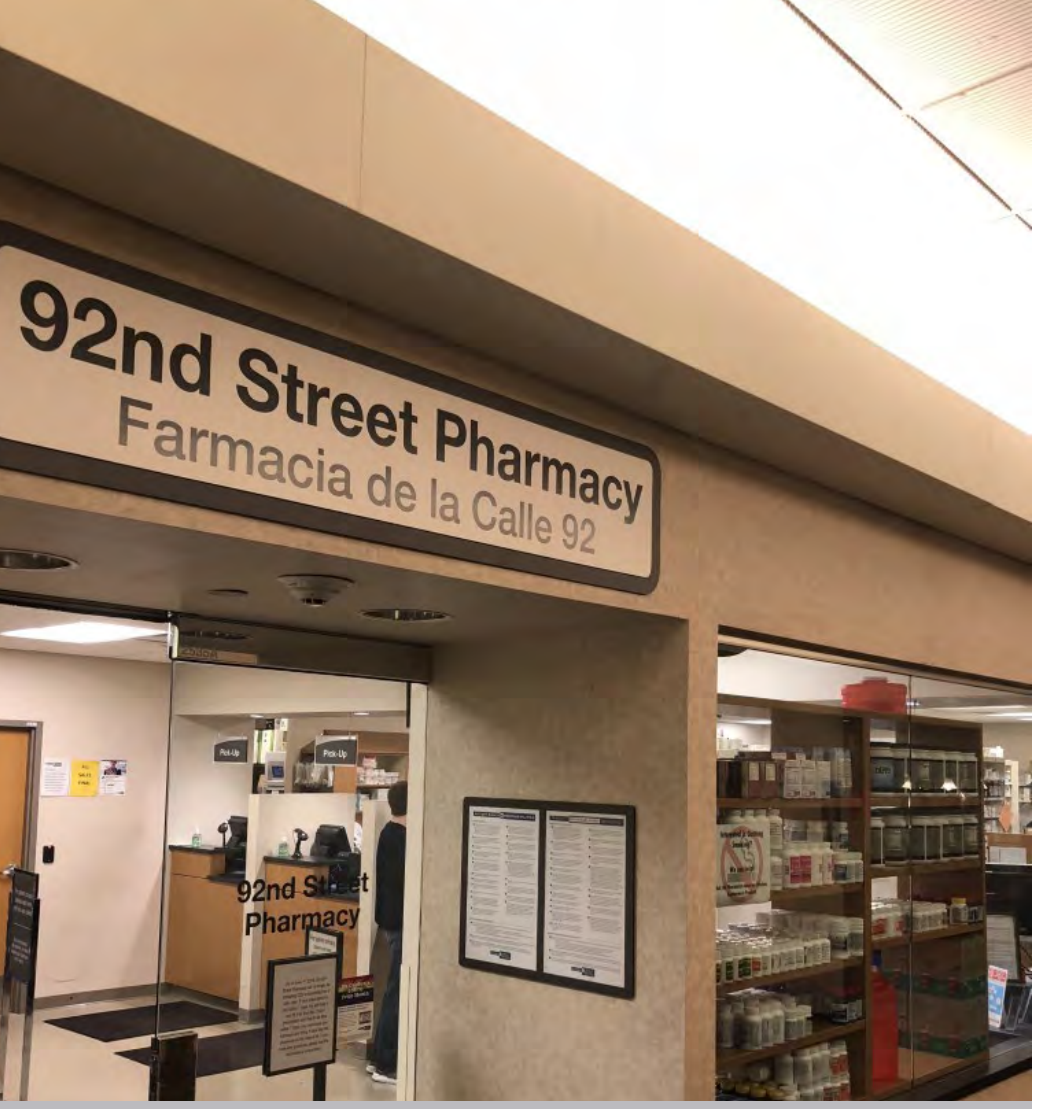
As pharmacists continue to expand their role and integrate into the interprofessional health care team, residencies are becoming an attractive way for pharmacists to gain experience and skills. Dr. Schaafsma also serves as the Residency Program Director for the Post Graduate Year One (PGY1) Pharmacy Residency (Ambulatory Focus). There are three residents enrolled in the 12-month residency that takes place in multiple of ambulatory and community pharmacy settings, including the Froedtert & MCW 92nd Street Pharmacy. Dr. Schaafsma describes the program as "a flexible, comprehensive training program in a variety of ambulatory care and community patient care areas." Rotations and activities within this residency are tailored to meet the needs and interests of each resident. Residents in the program also have the opportunity to work with and serve as a preceptor for student pharmacists on practice experientials. Pharmacists at the site enjoy working with and precepting students from Concordia University Wisconsin, the University of Wisconsin-Madison, and the Medical College of Wisconsin. In addition, the pharmacy provides an internship program for student pharmacists and accepts pharmacy technician students from the Madison Area Technical College.

Similar to the Pharmacy Society of Wisconsin (PSW), the Froedtert & MCW 92nd Street Pharmacy is truly committed to advancing the profession of pharmacy with the purpose of improving the lives of their patients. Dr. Schaafsma is also involved with PSW, serving on the PSW board of directors and as a co-champion of the PSW Adherence Competence Collaborative (PACC). While attending the 2018 Annual Meeting, Dr. Schaafsma enjoyed the exciting updates on provider status as well as the National Community Pharmacists Association (NCPA) Innovation Center Enhanced Services Boot Camp. She said the boot camp provided her with valuable insight relevant to community pharmacy professionals on topics such as workflow best practices, financial planning, and billing for services.

Raising the Bar

Dr. Schaafsma is proud of the highly-trained staff at the Froedtert & MCW 92nd Street Pharmacy. All pharmacy technicians are required to receive certification from the Pharmacy Technician Certification Board within six months of hire. In addition, a new technician training program has been implemented. This program allows new employees without prior education or pharmacy experience to complete formal classes while being trained in the pharmacy. The program provides access to a new career path for those who are interested in becoming pharmacy technicians.

The Froedtert & MCW 92nd Street pharmacy provides many opportunities for pharmacy technicians to expand their roles in pharmacy practice. There is a formal technician advancement pathway



Above: *92nd Street Pharmacy entrance.* ***Below:*** *Staff members Jalisa Mickey, Tom McEmmel, and Taylor Clementz at 92nd Street Pharmacy.*

which allows technicians to increase their responsibilities and compensation through promotions. Another way that technicians have expanded their roles in Froedtert pharmacies is through the PSW Tech-Check-Tech initiative. This allows technicians to perform the final verification of certain medications. Tech-Check-Tech is currently used in the inpatient setting at Froedtert Hospital and is being piloted at another Froedtert & MCW outpatient location. Dr. Schaafsma is evaluating the potential implementation of a Tech-Check-Tech pilot at the Froedtert & MCW 92nd Street Pharmacy. Programs like the technician advancement pathway and Tech-Check-Tech allow pharmacy technicians to practice at the top of their role.

Various technologies are used throughout the Froedtert & MCW 92nd Street Pharmacy to improve patient care. One unique technology offered by the pharmacy is a medication management phone application called Froedtert Rx. The app provides patients with a complete medication list, reminders for when to take their medications, the ability to request refills, and text notifications for when their prescriptions are ready for pick-up. This makes it easier for patients to remain adherent to their medications. Another technological advancement used to improve workflow efficiency at Froedtert & MCW 92nd Street is a medication-dispensing robot. The use of the robot reduces wait times and frees up more time for pharmacists to perform direct patient care services, such as medication reconciliation and patient counseling.

The Froedtert & MCW 92nd Street team is committed to improving patient outcomes within transitions of care. The strong partnership between inpatient pharmacists at Froedtert Hospital and outpatient pharmacists at Froedtert & MCW 92nd Street facilitates communication when patients are discharged. Dr. Schaafsma reports that nearly 100% of Froedtert patients will have a complete medication reconciliation performed before discharge and 50% of patients receive medications prior to discharge through the meds-to-beds program. These services ensure that patients have every medication they need to stay healthy when they go home, resulting in

reduced readmission rates.

To support the expanding role of the pharmacist, one of the pharmacy's practice advancement initiatives for 2018 was to ensure that all staff pharmacists were immunization trained. This initiative improved patients' access to immunizations, decreased the patients' burden of clinical appointments, and increased the overall percentage of immunized individuals in the community. During the implementation of this practice advancement, staff buy-in was required due to limited time, workflow changes, and additional training requirements. For success, every team member needed to recognize the importance of the pharmacy's ability to provide this service and the required teamwork to provide an exceptional patient experience. The driving force that prompted this initiative was shifting attention back to high-quality patient care. Metrics such as the immunization rates in Wisconsin helped the staff visualize common goals for improving patient care.

Bumps in the Road

One of the major challenges the Froedtert & MCW 92nd Street Pharmacy faces, like many community pharmacies, is a small physical space that does not allow a unidirectional workflow. To combat this challenge, the pharmacy team utilizes strong communication and organizational skills. The communication board and staff huddles are essential to make sure that the lack of space does not impact patient care.

Another major challenge that affects the pharmacy team is the escalating complexity of insurance. To address this challenge, the technician training program focuses on problem-solving with insurance companies. The technician training and advancement initiatives allow pharmacists to leverage technician support, so the pharmacist can perform more direct patient care services. Froedtert Hospital is also pursuing technological solutions to improve workflow efficiencies.

Moving Forward

The Froedtert & MCW 92nd Street Pharmacy is focused on improving medication adherence and promoting healthy lifestyle habits for every patient they serve. The Froedtert.com website and FroedtertRx mobile app are both excellent resources that improve patient experiences and medication adherence through easy to use features.

Recent professional development and training opportunities for Froedtert & MCW pharmacists include events sponsored by the Wisconsin Pharmacy Quality Collaborative (WPQC) and PSW, medication adherence seminars, and smoking cessation programs. Pharmacy technicians play a big part in the daily workflow, and they will continue to take on new responsibilities that leverage their skills, so pharmacists can provide individualized high-quality care to the community.

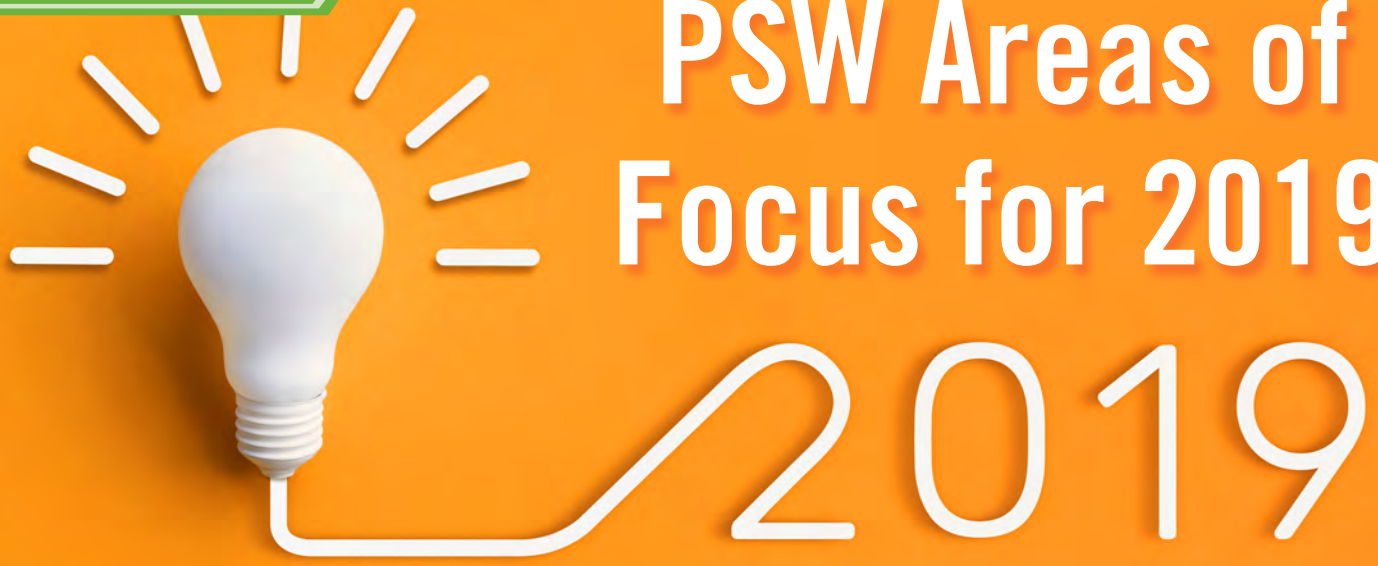
Dr. Schaafsma believes in a strategic planning and goal-setting model to effectively implement changes to her team's practice setting. Communication and constructive feedback from every team member, as well as patients, are focal points in establishing the pharmacy's long-term goals. Short-term goals are then created and used as stepping stones to achieve larger objectives. Recommendations made by the front-line staff have been incredibly valuable in adjusting workflow, which has allowed the 92nd Street Pharmacy to thrive in times of increasing demand. Team members prepare for obstacles to arise, however, collaboratively learn from these challenges to achieve success. Throughout the process of implementing change, Dr. Schaafsma expressed that it is crucial to keep an open mind to every team member's thoughts and suggestions to maintain a unified and motivated pharmacy team.

> **"I am thankful to work for a hospital that puts patient care first. I am proud of our discharge program and how it helps ensure patients get their medications after being discharged from the hospital. I sincerely believe all teams play an important role and do their best to come together to make sure a patient has everything they need upon discharge in hopes of reducing the chance of readmission."**
>
> ***- Jennifer Talsky, Lead Discharge Pharmacy Technician***

Holly Schaack and Cassandra Rucks are P3 Doctor of Pharmacy Candidates at the Medical College of Wisconsin School of Pharmacy in Milwaukee, WI. Parker Kneuppel is a P2 Doctor of Pharmacy Candidate at the Medical College of Wisconsin School of Pharmacy in Milwaukee, WI.

Acknowledgements: We'd like to thank Kate Schaafsma for her time and assistance.

PSW Areas of Focus for 2019



by Nick Olson, PharmD, BCPS

They say good things come in groups of seven. There are the seven habits of highly effective people, the Seven Wonders of the World, seven days of the week and seven colors in the rainbow. While perhaps not as grandiose as the former listed groups, the PSW Board of Directors convened in mid-January and ratified the organization's strategic plan for 2019; to no surprise, PSW identified seven strategic goals and priorities of focus for the upcoming year.

Developing the annual strategic goals and priorities is an extensive process. It starts with intensive gathering of information and input from the membership and culminates with the Board of Directors crafting the goal statements and ratifying them at the January PSW Board Meeting. PSW staff and volunteer leadership use this document to guide and direct activities PSW engages in throughout the year. Progress towards these goals is tracked and will be regularly shared with the membership. As a PSW member, it is important to keep you informed as to where your resources are being directed and where you have opportunities to get involved with the organization.

While not designed to be a comprehensive reflection of all PSW activity, PSW areas of focus for the coming year – the following strategic goals – are designed to reflect focused initiatives that both the PSW Board and the PSW staff are tracking the progress of and focused initiatives in which there can be further engagement of the membership as a whole.

The following are the seven strategic priorities PSW has identified for 2019:

Goal 1

Continue and expand activities supporting the achievement of legal pharmacist provider status in the state of Wisconsin

The PSW Pharmacist Provider Status work group will continue efforts towards this goal. Activities include 1) advancement of a three-pronged approach to further solicit member feedback regarding perceived effects of provider status on their work environments, 2) engagement of external stakeholders in an effort to further communicate the benefits of provider status, and 3) highlighting the economic importance of the advanced roles pharmacists routinely engage in.

Goal 2

Continue and expand activities supporting technician practice advancement, competency, and regulation

A well-trained and appropriately regulated technician workforce is essential to the advancement of pharmacy practice in Wisconsin. Activities related to this goal will include convening a stakeholder group comprised of technicians, pharmacists, and administrators to further develop a long-term approach to addressing technician-related issues. We will pursue additional legislative efforts to expanded technician roles in well-researched areas and allow for better tracking and training of technicians across the profession.

Goal 3

Create visible opportunities to engage student pharmacists in PSW, focusing on retaining them as members post-graduation

Student pharmacists are key members of our organization. Student pharmacists represent the future of our profession and it is critical that PSW supports their development - not only to advance care for patients, but also develop future organizational leaders. PSW is working to further engage students in organizational activities and create a more streamlined process to solicit feedback from student pharmacists on professional issues.

Goal 4

Foster positive working relationships and policy development with legislators, administration officials and staff, and other policymakers

The results of the 2018 elections have created many opportunities for pharmacists in Wisconsin. It is crucial that we maintain our current relationships with elected officials and policy makers, as well as establish positive relationships with

new individuals. PSW will continue its work with raising funds for the Friends of Pharmacy Conduit. We will also further expand support from the Conduit to connect PSW members with their local legislators, facilitating connections and engagement. Finally, PSW will continue to pursue legislative reform, addressing the role of pharmacy benefit managers (PBMs) and the laws and regulations governing pharmacy practice.

Goal 5

Continue work to support pharmacists' roles in improving patient care, population health, and public health

PSW is involved in many different practice advancement programs. Much of the grant work PSW is engaged in advances pharmacists' roles in immunizations and population health. With the breadth and depth of these activities, it is imperative that PSW communicates to its members how they and their organizations can become involved. True success with practice advancement programs is gauged based on the participation of pharmacists and integration into pharmacy practice. PSW will continue to foster and promote activities that expand involvement to additional pharmacists and practice sites. PSW will also continue to engage stakeholders and pursue grant opportunities in an endeavor to develop new avenues of professional growth and advancement.

Goal 6

Develop a strategy to support connectivity, communication, and common culture and vision between leadership of PSW advisory groups, sections, taskforces, ad hoc groups, and PSW Board of Directors

PSW is an ever growing and ever evolving organization. As development continues, it is important for our organization to adapt its structure to best facilitate achievement of goals as well as allow maximal opportunity for member engagement. A group of PSW members and leaders will be recruited to discuss best practices in organizational structures and communication in order to create a common vernacular and expectation for different organizational roles.

Board Member Perspective

I want to applaud the Board of Directors and PSW Staff for engaging in a thorough process of goal setting and prioritization with the various constituents of PSW, resulting in the PSW 2019 Strategic Goals and Activities. As a professional pharmacy organization that represents all pharmacy practice interests in the state, PSW has a very unique (and envious as I have observed in other state pharmacy organizations) position of articulating a broad-based agenda that advances the laudable goals for all members, including pharmacists, pharmacy technicians, and pharmacy students. Some of the goals and associated activities are well on their way to being executed such as, Goal 2: Technician Practice Advancement and Goal 7: Operational Structure and Financial Strength. However, several goals will require PSW member engagement well beyond this year alone, such as Goal 1: Provider Status and Goal 5: Patient Care/Population Health. As PSW members, we all should feel compelled to select one of the seven goals and associated activities to realize their fruition. In fact, ask a colleague to join you on this quest, and if not a member, convince them to join PSW for the very same reason you asked them to work with you on a worthy cause, for the benefit of our patients, the profession and the state.

- George E. MacKinnon III, PhD, MS, RPh, FASHP
Founding Dean School of Pharmacy
Professor Pharmacy, Family Medicine, and Institute for Health and Equity
Genomic Sciences and Precision Medicine Center
Medical College of Wisconsin, Milwaukee

Goal 7

Continue to pursue and maintain efforts that improve operational structure and financial strength of the organization

PSW is a financially strong organization and continues to be one of the strongest state organizations in the country. The PSW headquarters is currently undergoing an extensive refresh and remodel. The remodel will significantly improve the ability of PSW to achieve its organizational goals. Advanced videoconferencing capabilities will allow PSW to better connect pharmacists, and dual purpose work and hospitality spaces will allow for better collaboration and engagement with other stakeholders. The Wisconsin Pharmacy Foundation will continue its activities in an effort to reach its fundraising goal of $500,000 for the Building Our Tomorrow campaign, supporting practice advancement efforts now and into the future. Additionally, PSW will continue activities that identify new funding streams for the organization.

2019 is poised to be another successful year for PSW. There is much work already underway in pursuit of the 2019 strategic goals, but there is also much work to be done. PSW owes its strength to its members. The goals we pursue are a direct result of the input from membership. The goals we achieve will be due to the efforts of the membership. We look forward to working together as we embrace the opportunities of the future.

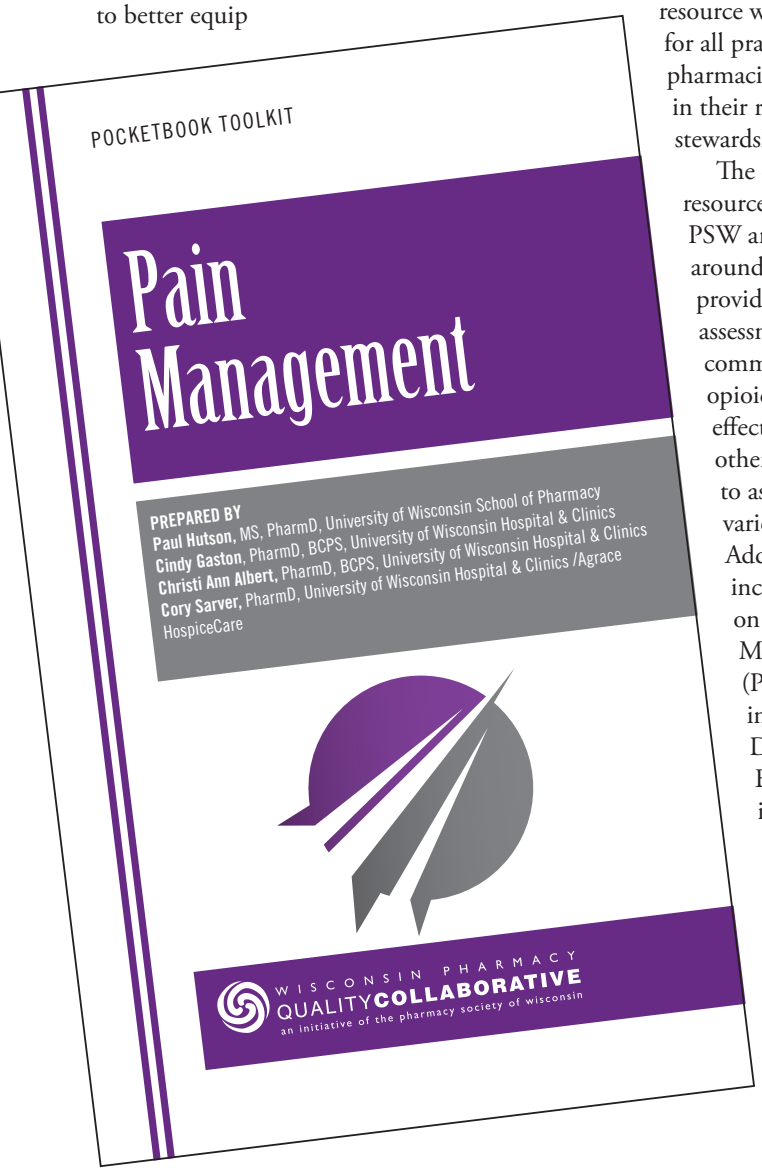
Nick Olson is the Chairman of the Board at the Pharmacy Society of Wisconsin in Madison, WI.

PSW Pain Management Clinical Pocket Toolkit

by Marshall Johnson, PharmD, Emily Bollom, PharmD

The opioid epidemic is a major challenge facing our nation today and the state of Wisconsin is no exception. Since 2015, the rate of prescription painkiller overdoses has increased by 238% among Wisconsinites ages 10-24.[1] Providing education and resources to support healthcare professionals is essential to ensure this issue is addressed with knowledge and understanding.

The need to better understand the opioid epidemic and provide resources to better equip pharmacists in Wisconsin is a primary focus of the Pharmacy Advancement Leadership Team (PALT) for the 2018-2019 year. PALT members are comprised of administrative pharmacy residents from across the state of Wisconsin. This group focuses on select priorities, annually, to make contributions to the advancement of pharmacy practice within the state. Currently, the PALT group is working to develop tools that will expand the role of the pharmacist in combating the opioid epidemic in the state of Wisconsin.



The PALT group envisions this resource will provide an outline for all practice settings to assist pharmacists and other practitioners in their roles surrounding opioid stewardship.

The current pain management resources available through PSW are primarily centered around the pocket toolkit that provides information on pain assessment, treatment strategies, common opioid and non-opioid medications, adverse effects with management, and other clinical pearls designed to assist pharmacists in a variety of practice settings. Additional resources, including information on the Prescription Drug Monitoring Program (PDMP), are available in the PSW Prescription Drug Abuse Prevention Education Toolkit located in the Professional Resource section of the PSW website.

Revisions to the pain management toolkit provide new guidance to pharmacists on implementing and improving opioid stewardship activities within their practice site and organization. Methods to achieve these objectives include the adoption of newer recommendations regarding pain management, more extensive naloxone prescribing and patient information, and provision of resources to help pharmacists through the process of difficult conversations with patients regarding their pain management and opioid prescriptions. The pocket toolkit will continue to remain concise and act as a convenient resource to pharmacists in all practice settings.

The toolkit is set to be released in 2019 and will be available on the PSW website at http://www.pswi.org/PSW-Store/toolkits. Stay tuned to learn more about the updates and how you can obtain a copy of the revised pocket toolkit.

Click here to purchase toolkits online:
http://www.pswi.org/PSW-Store/toolkits

Marshall Johnson is a PGY2 Health-System Pharmacy Administation resident at Froedtert & the Medical College of Wisconsin in Milwaukee, WI. Emily Bollom is a PGY1 Health System Pharmacy Administration Resident at William S. Middleton VA Hospital in Madison, WI.

Acknowledgements: PSW and PALT would like to recognize and honor the memory of Cindy Gaston, PharmD, BCPS, an original author of the Pain Management Pocket Toolkit.

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PSW Welcomes Helene McDowell

by Helene McDowell, MS

My name is Helene McDowell and I am the newest PSW team member. As the Senior Manager, Pharmacy Quality and Community Outreach, I will be working to support and expand WPQC, pharmacy practice and comprehensive medication review (CMR) initiatives. While I have only been at PSW since January, I have been working for the last two years with our community CMR program at United Way of Dane County. I feel like I have been a part of PSW and this important work for much longer than three months.

A Little Bit About Me

I have spent my professional career working in community agencies and health clinics with low socioeconomic status (SES) families providing health education, advocacy, and facilitating access to quality healthcare. This work has included health systems implementation, outreach, education, program management, research and evaluation. Additionally, I have worked with public health and government agencies, academic research centers, non-profit organizations, and healthcare provider and payer systems. A winding path for sure, but the overarching goal has always been to improve quality of life for the families being served!

On a personal note, I have a small, but close-knit family spread around WI, MN, FL and HI. We gather regularly and try to laugh hard when we are together. I am lucky, because in order to see some of my family I get to travel to Hawai'i. Every February, I escape the cold winter to get warm and walk along the beaches of the islands. And, if I am really lucky, I get to scuba dive with the whales, fish and turtles that love that part of the world. It is a special place for me, and certainly like no other I have ever visited!

Let's see, what else to tell you? I don't usually sit still. I need to be active, and am an obsessed gardener and walker. I have a huge perennial garden with over 75 different types of flowers and plants. Sadly, my love of gardening requires me to have a flower budget to keep me in check when I go to the nursery or farmers' market. Between you and I, I have been known to pass up fresh veggies for a beautiful flower!! I also like to walk, and can be found daily either on my treadmill (winter) or taking a long walk with my golden retriever, Quinn. Walking is my way to be kind to myself, healthy and also take time to sort through the day.

I would like to thank my coworkers at PSW for being so welcoming and for helping me to get 'settled' here at PSW. I feel very fortunate to be part of this organization!

Thank you and I look forward to meeting you and working together in the future.

Helene McDowell is the Senior Manager of Pharmacy Quality and Community Outreach at the Pharmacy Society of Wisconsin in Madison, WI.

WPQC Spotlight: Community Pharmacy

by Paige Edwards, 2020 PharmD Candidate

Community Pharmacy, conveniently located on State Street in downtown Madison, WI, has been a local favorite since 1972. The pharmacy's wide selection of natural medication alternatives, such as herbs, supplements, and homeopathic remedies, satisfies a growing area of interest for patients. This creates a broadened role for pharmacists at Community Pharmacy to work closely with the supplement department in order to optimize care for patients who are interested in nontraditional medicine. The pharmacists use their expertise on drug interactions to help patients select herbals or supplements that can be used safely with their prescribed medications.

Delegation on Safe and Healthy Aging

United Way of Dane County is a local organization that strives to provide financial, educational, and health related resources to low-income, uninsured members of the community. One of their initiatives, started in 2011, is a Delegation on Safe and Healthy Aging.1 The delegation works to keep older adults living safely and independently in their homes by reducing emergency room visits and hospitalizations related to adverse drug events and falls. Because the delegation was initially successful, United Way set a goal in 2017 to reduce the rate of adverse drug events and falls leading to emergency room visits and hospitalizations in Dane County 20% by 2022.[2] United Way uses three main strategies to reach their goal: comprehensive medication reviews (CMRs), in-home safety assessments, and falls prevention classes.2 During CMRs, pharmacists make recommendations to reduce adverse drug events and optimize the efficacy of patients' medication regimens.

Community Pharmacy is a Wisconsin Pharmacy Quality Collaborative (WPQC)-certified pharmacy through the Pharmacy Society of Wisconsin (PSW). WPQC-certified pharmacists provide CMRs, which is a billable service through Wisconsin Medicaid. United Way partnered with PSW to facilitate WPQC-certified pharmacists to provide CMRs to high-risk, underserved older adults in Dane County. Community Pharmacy has been active in the United Way of Dane County Community Model for three years.[1]

Pharmacists' Background

Community Pharmacy pharmacists, Monica Cauble and Aimee Speers, are two active volunteers in the United Way/PSW Community Model. Monica completed her pharmacy school training at the University of Texas-Austin School of Pharmacy. After graduating in 2007, she completed a one year community care/ambulatory care residency, where she spent time training in anti-coagulation and diabetes clinics. Her residency location had its own health plan, which created the opportunity for Monica complete internal medication therapy managements (MTMs) for health plan members. After five years of practicing in Texas, Monica moved to Wisconsin and began working at Community Pharmacy. Monica says she was excited to be in a community pharmacy setting where she could help a broad patient population because she loves talking with patients.

Aimee's pharmacy experience began as a pharmacy clerk and technician when she was 15 years-old. After graduating from the University of Wisconsin-Madison School of Pharmacy in 2005, she began her pharmacy career practicing at an independent community pharmacy with a large geriatric patient population. Following a change in ownership that transitioned the pharmacy into long-term care, Aimee practiced as a long-term care pharmacist for a few years. Aimee is now the Pharmacist in Charge at Community Pharmacy where she enjoys interacting with their diverse patient population. Being an independent community pharmacist has always been her goal, and helping her community is her passion.

Involvement in the United Way/PSW Community Model

Monica and Aimee walked into their first CMRs feeling ready to jump in and talk with patients. To help prepare, they utilized helpful resources on the PSW website including online training modules, organized CMR templates, and communication tools for making recommendations to providers. Monica recommends completing training on how to use Aprexis, which is the software program pharmacists volunteering with the United Way/PSW Community Model use to bill CMR services.

WPQC Training can be found here: www.pswi.org/WPQC/Training/WPQC-Homestudy

The CMR appointments are a time for pharmacists to both review patients' medications and address patients' individual concerns. For Monica and Aimee, their favorite part about volunteering is seeing how grateful patients are to have their questions answered. Aimee enjoys talking with people from the community and listening to their stories, and says she always feels appreciated by the end of the appointment. Monica and Aimee apply their knowledge about supplements during CMRs by recognizing medications that may be causing nutrient depletions in the patient, and then recommending vitamins or minerals to supplement when appropriate. They are also equipped to answer most supplement related questions and to provide alternative medication recommendations to interested patients.

The United Way/PSW Community Model also has volunteering opportunities for second and third-year pharmacy students to gain experience providing

Above: *Street view of Community Pharmacy in downtown Madison, WI.*

CMRs. CMR events are promoted to students through the Wisconsin Society of Pharmacy Students (WSPS) by a student liaison. Some of the students' roles include taking patients' blood pressure, learning how to analyze patients' medication lists, and helping the pharmacist document and bill CMR services.

Making an Impact

One patient visit that especially meaningful for Monica was when she was able to help a man regain control of his hypertension. The patient presented to her with uncontrolled hypertension, likely related to only taking only one of his four prescribed hypertension medications. After communicating with the patient and his care provider, Monica was able to help the patient start a new regimen of two blood pressure medications that the patient was more willing to take. Her intervention helped motivate the patient to start monitoring his blood pressure again while strengthening her relationship with the provider, who was unaware of the patient's noncompliance.

Aimee says she feels like she makes a difference when she is able to address the patients' concerns, no matter how big or small. During one CMR with an elderly man, Aimee noticed the medications in his medication boxes were not organized, and his medication box maps were not up to date. As a result, the patient was both nonadherent to his medication regimen and was not taking his medications correctly, which could have led to serious complications. Aimee and a student made adjustments to his medication boxes that day, and followed up with the patient's pharmacy so they could update his box maps and find a better way to communicate future medication additions or deletions with the patient. Although it was a simple intervention, the patient was thankful for their help.

The United Way/PSW Community Model utilizes pharmacists' expertise and accessibility to help promote safe and healthy aging for older adults. It also creates an opportunity for pharmacists to advocate for their profession and establishes a safe space for patients to feel comfortable asking questions they would otherwise be unable or unwilling to ask. Patients value the opportunity to meet with a health care professional in an accessible setting, and pharmacists gain personal satisfaction from the interactions.

In addition to United Way's Delegation on Healthy Aging goals, it's clear to see the positive impact the United Way/PSW Community Model has in the Dane County community. Thankfully there are dedicated pharmacists like Monica and Aimee to help make the program possible.

Paige Edwards is a 3rd Year Doctor of Pharmacy Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI.

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Pharmacy's Dizygotic Twins

by Donald E. Letendre, BSPh, PharmD

Witnessing the unique bond between twins is truly fascinating. And when that observation is applied to Pharmacy there is no better example, in my opinion, than the special bond that exists between Iowa and Wisconsin. Born initially out of a very special friendship between CEOs Tom Temple and Chris Decker, PSW and IPA became the first unified state pharmacy associations in the nation, an astonishing accomplishment. As Dean at Iowa and as an honorary UW residency graduate, I have had the unique privilege of witnessing first-hand for many years the extraordinary efforts of both organizations, their forward-thinking governing boards, and their equally amazing legacy of leadership. On countless occasions, I have gushed with pride as I trumpeted the many wonderful examples of the highest professional ideals exhibited by pharmacists from both states. Just think for a moment the profound impact their actions have had on countless students, residents, and other young practitioners launching their careers who have laid witness to such exemplary professionalism. 'Leading-by-example', 'walking-the-talk', and 'work-hard-play-hard' are most deserving phrases to include in the Iowa/Wisconsin pharmacy lexicon!

Careful examination of the fundamental objectives of both organizations is instructive: collaboration; advocacy through a unified voice; innovation; education; active engagement; promoting leadership development; and, pursuing positive patient outcomes that make a difference in patients' lives are among those that stand out. And while these words are simple to scribe, what separates these two organizations from most of their counterparts is the purposeful, vigorous, dedicated, and resolute manner in which they approach these lofty goals. Doing so requires sustained, thoughtful leadership, an unwavering commitment, and a determined membership. Is it any wonder then that Kate Gainer, IPA's CEO since 2012 is a Wisconsinite by birth and education, and PSW's Chris Decker, conversely, is an Iowan by birth and education…how ironic, yet, how fitting!

Dizygotic twins…separate, but in so many ways they have clearly emerged from the same organizational DNA. As a consequence, there is a notable level of mutual trust, caring, and outward expressions of respect that are both palpable and visibly noticeable even to the most casual of observers. Throughout the years, these shared virtues have been on full display through joint efforts like "Leadership Pharmacy", a unique leadership development program dedicated to new practitioners (no more than 15 years of active practice since graduation), and the annual PSW/IPA Leadership Dinner that brings together presidential officers, academic leaders, key thought leaders from both states, and their respective association executives and protégées. These annual events provide meaningful opportunities to share programs, perspectives, policies, best practices, and strategies as well as foster a depth of fellowship that is simply uncommon in today's fast-paced, ever-changing healthcare environment. Moreover, these efforts have helped facilitate the growth and development of national leaders. One need only to look at the roster of presidential and board-elected officers to many of the nation's pharmacy organizations over the past few decades to fully appreciate the dramatic impact both organizations have had. Consequently, it is with little wonder that the cultures exhibited by both organizations mirror each other so closely.

PSW was formed in 1998 and IPA followed suit a few months later in January 1999. As both organizations celebrate 20 years of exemplary leadership, it seems only fitting that we take pause to celebrate their achievements as two of the nation's most premiere, productive, prolific, and purposeful state pharmacy organizations. Not unlike decades past, pharmacy continues to face many daunting challenges. Yet, there is no doubt in my mind that the leadership of both organizations will be at the fore tackling these challenges head-on just as they have done since the birth of their existence.

Frankly, I am in awe observing the highly professional manner in which PSW and IPA consistently and deliberately go about their business. PSW and IPA….I salute you!

Born out of a shared vision….united by a shared cause….truly, truly amazing!

Donald Letendre is the Dean and Professor at the University of Iowa College of Pharmacy in Iowa City, IA.

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