

May/June 2024

The Journal

of the Pharmacy Society of Wisconsin

2024 PSW Legislative Day Recap



Continuing Education

4

CE for Pharmacists & Technicians: **Dynamic Diabetes Updates: Current Management Guidelines for Type 2 Diabetes**

Features

3

UpFront: **Building the Future of Pharmacy - PSW Members' Community Outreach in Waunakee, Wisconsin**

Original Work

12

Impact of a Pharmacist Led Comprehensive Medication Management Program in Patients with Diabetes in a Rural Health Care Setting

18

Incorporating a Student Pharmacist in the Deprescribing Process for Long-Term Care Patients

Review Articles

24

Understanding and Addressing Medical Misinformation and Disinformation: The Pharmacist's Role

31

The Importance of Building Upon Critical Thinking in the Setting of Patient Care

Spotlight

34

Business Member Spotlight: Rhinelander Hometown Pharmacy

Meeting Recap

36

2024 PSW Legislative Day Recap

The Journal

of the Pharmacy Society of Wisconsin

Pharmacist Editor
MICHAEL NAGY, PharmD, BCACP

Managing Editor & Creative Content Director
MEGAN GRANT, mgrant@pswi.org

Copy Editor
JENNIFER PITTERLE

Peer Review Coordinators
MARISA GONINEN, PharmD, BCACP
AMANDA MARGOLIS, PharmD, MS, BCACP
ZACHARY PAPE, PharmD, BCACP
KHYATI PATEL, PharmD
SARAH PEPPARD, PharmD, BCPS, BCCCP
PATRICIA THORNEWELL, PharmD

ID Corner Series Coordinator
LYNNE FEHRENBACHER, PharmD, BCPS-AQ ID

Precepting Series Coordinator
MELISSA THEESFELD, PharmD

Open Access Coordinator
THEO BUNA, 2026 PharmD Candidate

EDITORIAL ADVISORY COMMITTEE

CHRISTI ALBERT, PharmD, BCPS
Clinical Pharmacist,
UW Health - Anticoagulation Clinic, Madison

KRISTEN BUNNELL, PharmD, BCCCP
Assistant Professor, Medical College of Wisconsin,
Milwaukee

LOREN CARRELL, PharmD
Clinical Pharmacist/Pharmacist in Charge,
Gundersen Health System, La Crosse

MARISA GONINEN, PharmD, BCACP
Pharmacy Manager, Aurora Health Care,
Milwaukee

MELISSA HA, PharmD, BCCCP
Clinical Pharmacist, William S. Middleton
Memorial Veterans Hospital, Madison

LYNNE FEHRENBACHER, PharmD, BCPS-ID
Associate Professor of Pharmacy Practice
Concordia University School
of Pharmacy, Mequon

LYNNAE MAHANEY, MBA, BS Pharm
Director, Pharmacy Accreditation
American Society of Health-System Pharmacists

MIKE OCHOWSKI, RPh, BBA
Formulary Pharmacist, Group Health Cooperative
of South Central Wisconsin, Madison

ZACHARY PAPE, PharmD, BCACP
Assistant Professor, Medical College of Wisconsin,
Milwaukee

KHYATI PATEL, PharmD
Assistant Professor of Pharmacy Practice
Rosalind Franklin University of Medicine and
Science College of Pharmacy, North Chicago, IL

SARAH PEPPARD, PharmD, BCPS, BCCCP
Assistant Director of Experiential Education
Concordia University Wisconsin School of Pharmacy

CASSIE SEDGWICK, PharmD
Clinical Pharmacist, William S. Middleton Memorial
Veterans Hospital, Madison

ASHLEY SRB, PharmD, CVT
PGY-1 Clinical Veterinary Pharmacy Practice
Resident, UW-Madison School of Veterinary
Medicine

TRISHA SEYS RANOLA, PharmD, CGP, CDE
Clinical Pharmacist, William S. Middleton Memorial
Veterans Hospital, Madison

PATRICIA THORNEWELL, PharmD
Medical Education and Grants, Exact Sciences
Corporation, Madison

KRISTIN TIRY, PharmD
Pharmacy Manager, Froedtert & the Medical
College of Wisconsin, Milwaukee

JOSHUA VANDERLOO, PharmD, BCPS
Clinical Pharmacist, Drug Policy Analyst,
University of Wisconsin Hospital and Clinics,
Madison

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

PSW EXECUTIVE BOARD

JANET FRITSCH, RPh
Chair of the Board

HANNET TIBAGWA AMBORD, RPh
President

RYAN MILLER, PharmD, BCPS
President-Elect

NICHOLAS LADELL, PharmD, BCPS
Treasurer

SARAH SORUM, PharmD, CAE
Executive Vice President & CEO

PSW BOARD

ANDREA MAIER, PharmD, BCPS
Region A Director 2023-25

ADAM GREGG, PharmD, BCPS
Region B Director 2022-24

DAVID SCHIEK, RPh
Region C Director 2023-25

JESSICA MOSCHEA, PharmD
Region D Director 2022-24

DIANE ERDMAN, PharmD
Region E Director 2021-25

JOHN MUCHKA, PharmD, BCPS
Region F Director 2022-24

SIRR GRICE, PharmD
Director-at-Large 2021-25

MEGAN OSE, PharmD
Director-at-Large 2022-24

WILLIAM PEPPARD, PharmD
Director-at-Large 2023-25

ANDREW WILCOX, PharmD
Director-at-Large 2022-24

JULIE THIEL, PharmD
Director-at-Large 2023-25

ERIK JORVIG, PharmD
Dean Concordia University Wisconsin SOP

STEVE SWANSON, PhD
Dean UW School of Pharmacy

GEORGE MACKINNON, PhD, MS, RPh
Dean Medical College of Wisconsin SOP

JENNA WEBER, PharmD
Senior & LTC Section Chair 2023-2024

BRIAN WITTENBERG
Technician Section President 2023-2024

PSW STAFF

ELLEN BRUMMEL
MEGAN GRANT

KATE HARTKOPF, PharmD, BCACP
HELENE MCDOWELL, MS
CHAD NECHVATAL, CPA
MICHAEL NAGY, PharmD, BCACP

SARAH PAGENKOPF, PharmD, BCPS
RYAN PSYCK
KAY SCHELL
SARAH SORUM, PharmD, CAE
KARI TRAPSKIN, PharmD
DANIELLE WOMACK, MPH, HIVPCP

Send correspondence to:

Megan Grant, Pharmacy Society of Wisconsin
701 Heartland Trail, Madison, WI 53717, phone: 608-827-9200,
fax: 608-827-9292, thejournal@pswi.org

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

Advertising inquiries:

Megan Grant, Pharmacy Society of Wisconsin, 701 Heartland Trail,
Madison, WI 53717, phone: 608-827-9200, fax: 608-827-9292,
mgrant@pswi.org



The Journal of the Pharmacy Society of Wisconsin (ISSN 2837-8229) is the official publication of the Pharmacy Society of Wisconsin. Published bimonthly by the Pharmacy Society of Wisconsin, 701 Heartland Trail, Madison, WI 53717. Opinions expressed by contributors do not necessarily reflect those of PSW.

Up Front: Building the Future of Pharmacy

PSW Members' Community Outreach in Waunakee, Wisconsin

by Hannel Tibagwa Ambord, PharmD, MS, MBA

PSW's mission is to provide a unified voice, resources, and leadership to advance the profession and improve the quality of medication use in Wisconsin.

As we head to Destination 2030, our summarized strategic planning goals are to:

- Build a sustainable, healthy pharmacy workforce and workplace
- Inspire professional growth
- Elevate care with technology
- Advocate for pharmacist and pharmacy technician roles in healthcare

It's inspiring to see the proactive approach taken by some PSW members in the Waunakee area to invest in their local community and inspire the next generation of potential pharmacy professionals. By sharing their pharmacy stories with 57 high school students, they're not only raising awareness about the diverse opportunities within the pharmacy profession but also fostering a sense of pride and enthusiasm for the field.

The initiative to partner local schools, including the UW-Madison School of Pharmacy and Waunakee High School, is a fantastic example of a grassroots effort to help address challenges such as lower enrollment in pharmacy schools and shortages of pharmacy technicians and pharmacists. By engaging directly with Waunakee High School students through events like the Health Occupations Students of America (HOSA) Future Health Professionals class, PSW members are showcasing the various facets of pharmacy practice, from academia to industry, and highlighting the impact pharmacists and pharmacy technicians have on healthcare.

In my opinion, the decision to leverage existing relationships within the local community and collaborate with PSW and pharmacy schools in Wisconsin demonstrates a strategic approach to building a sustainable pharmacy workforce from the ground up. By investing just 2-3 hours a year to share their stories and

passion for the profession, PSW members can contribute to shaping the future of pharmacy in their communities.

"Think local, act local" strategy; it's heartening to see PSW's support for these grassroots efforts, as evidenced by their assistance in facilitating connections with local pharmacists. Local pharmacists then collaborate with their local middle/high schools and our in-state pharmacy schools.

By working together at the local level, PSW members can help by elevating our pharmacy image and lay the foundation for a strong and vibrant pharmacy workforce that will continue to serve the healthcare needs of Wisconsin for years to come.

Hannel Tibagwa Ambord is the President of the Pharmacy Society of Wisconsin in Madison, WI.

Click the image below to view the Student & Resident resources on the PSW website.

Pharmacy Student & Resident Resources

Pharmacy Student Resources

- [PSW Student Pharmacist Advisory Committee](#)
- [Christopher Decker Pharmacy Scholarship](#)
- [PSW Network - Student Pharmacists Discussion Board](#)
- [PSW Job Board](#)

Educational Resources

- [PSW Clinical Toolkits and Manuals](#)
- [Wisconsin Pharmacy Law Review](#)
- [APPE Student - WPQC Homestudy Course](#)
- [Emerging Writers Course](#)

Residency Resources

- [ASHP Residency Directory](#)
- [Veterans Affairs Pharmacy Residency Programs](#)
- [Wisconsin Ambulatory Care Pharmacy Residency Listing](#)
- [Practice Advancement Leadership Team \(PALT\)](#)
- [Wisconsin Pharmacy Residency Conference](#)

PhORCAS


- [Applicant Portal](#)
- [FAQs](#)

Explore the Pharmacy Profession

- [Pharmacy Career Slide Deck](#)
- [Top Reasons to Be a Pharmacist](#)
- [Pharm4Me Brochure \(English\)](#)
- [Pharm4Me Brochure \(Spanish\)](#)
- [ASHP Pharmacy FAQs](#)
- [ASHP Health-System Pharmacy Roles](#)

Prospective Students

- [Concordia Wisconsin University School of Pharmacy](#)
 - [Concordia Student Pharmacists Association \(CSPA\)](#)
- [Medical College of Wisconsin School of Pharmacy](#)
 - [Pharmacy Student Alliance \(PSA\)](#)
- [University of Wisconsin-Madison School of Pharmacy](#)
 - [Wisconsin Society of Student Pharmacists \(WSPS\)](#)
- [PharmCas - Pharmacy College Application Services](#)



Congratulations, Graduates!

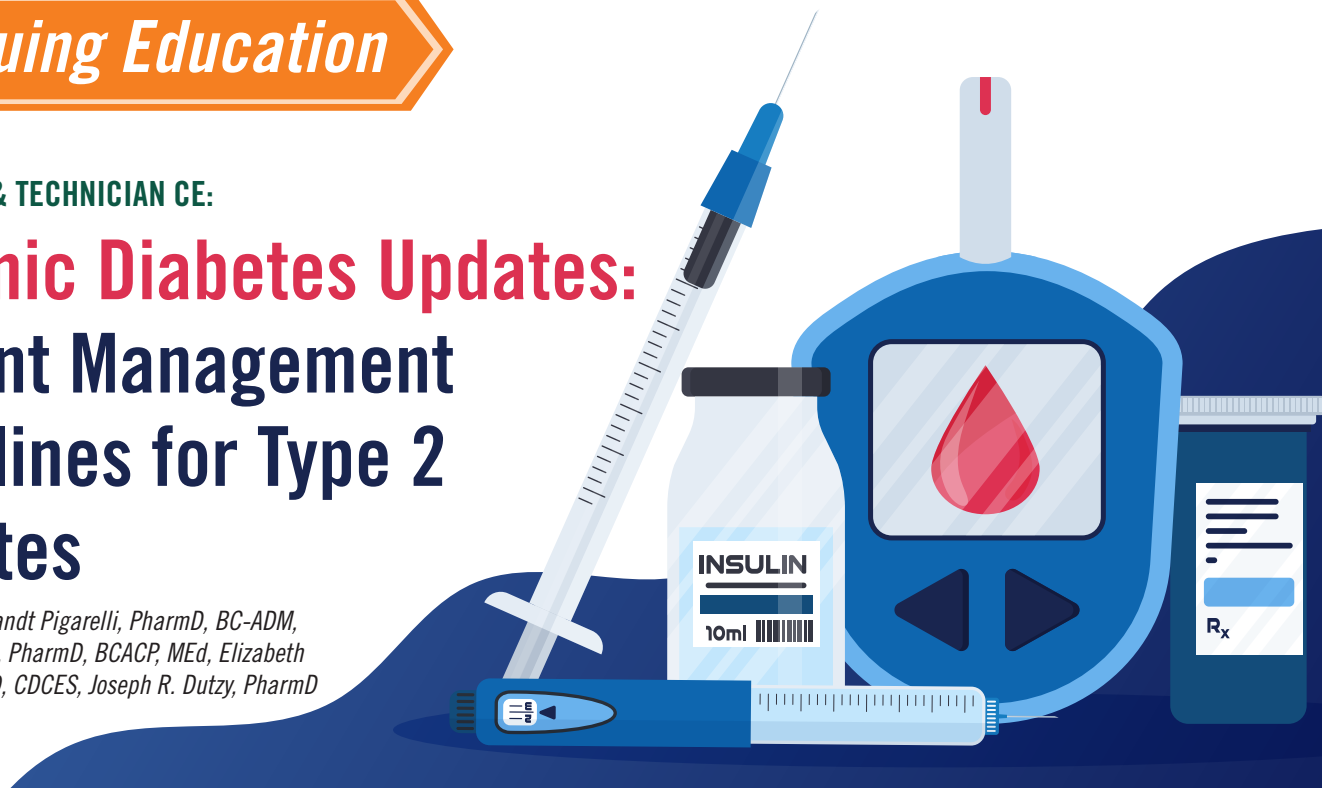
Our Gift to You!
PSW is making an investment in new graduates by continuing to support their professional development by providing new graduates one FREE year of membership.

Stay Connected!
We know that staying connected and growing professionally will impact the enjoyment you find as a pharmacist now and for your whole career.

PHARMACIST & TECHNICIAN CE:

Dynamic Diabetes Updates: Current Management Guidelines for Type 2 Diabetes

by Denise L. Walbrandt Pigarelli, PharmD, BC-ADM,
Francesca Johnson, PharmD, BCACP, MEd, Elizabeth
A. Buckley, PharmD, CDCES, Joseph R. Dutzy, PharmD



Although there are subtle differences in current treatment recommendations from various stakeholders, the underlying similarities include ongoing updates based on emerging evidence, a focus on comprehensive, inclusive patient-centered shared decision-making, and the importance of managing comorbidities. Pharmacotherapy recommendations are to be individualized based on social determinants of health, glycemia, and presence of comorbidities and complications. The complications-centric focus includes using agents that reduce the risk of cardiovascular and kidney (cardiorenal) disease progression independent of glycemic status. In addition, the important role of obesity management continues to be more pronounced across all guidelines as a cornerstone of care for persons with diabetes. An overview of the similarities and differences among common diabetes guidelines in the United States are included here.

The American Diabetes Association (ADA) Standards of Care

The American Diabetes Association Standards of Care in Diabetes are published annually in the January supplement to Diabetes Care and are updated continually

CE FOR PHARMACISTS & TECHNICIANS

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

Learning Objectives

- Evaluate the key updates to the 2024 ADA Standards of Care in Diabetes and the impact on therapeutic decision-making
- Assess modifications and updates in the 2023 ACE Algorithm for diabetes management and the impact of these changes on patient care, medication selection, and monitoring practices
- Discuss the similarities and differences among guidelines, especially related to how pharmacists can integrate them collaboratively to promote a comprehensive, patient-centered approach to diabetes management
- Examine the nuances of diabetes management in people with diabetes over age 65 based on the Endocrine Society guidelines for the treatment of diabetes in older adults, with considerations for their specific needs
- Explain the nuances of treating diabetes in youth and during pregnancy

on the ADA website.^{1,2} The Standards are also available via smartphone app from Google Play and the App Store and contain helpful resources such as a hemoglobin A1C (A1C) to estimated average glucose calculator.³ The 2024 Standards included reinforcement of previous changes, and further minor changes to clarify and reflect new evidence.¹ In 2023, the ADA Standards of Care were congruent with the 2022 joint consensus statement by the ADA with the European Association for the Study of Diabetes (EASD) (published in October 2022), which focused more on a holistic, team-based, patient-centered approach including formal self-management training for people living with diabetes.⁴ The

continued use of person-first and inclusive language to help support and empower people with diabetes is highlighted in both guidelines, with an additional focus on social determinants of health.

The joint statement proposed that providers recommend a therapeutic approach with the efficacy to achieve and maintain treatment goals in the following four areas: glycemia, weight, cardiovascular risk factors, and cardiorenal protection.⁴ Regarding glycemic management, medications should be selected that meet the needs, values, and goals of the person with diabetes (Table 1), including consideration for social determinants of health. Typically, initial glucose-lowering therapy for type

2 diabetes consists of metformin and/or other agents that meet needs for glycemic management, with a focus on improving outcomes with compelling indications such as existing atherosclerotic cardiovascular disease (ASCVD), heart failure (HF), or chronic kidney disease (CKD).

The current ADA algorithm (Figure 9.3) for the use of glucose-lowering medications in the management of type 2 diabetes recommends healthy lifestyle behaviors, diabetes self-management education and support (DSMES), and social determinants of health assessment as a starting point for all people with diabetes, and then is split into two pathways.⁵

The left pathway of the algorithm recommends initiating drug therapy for cardiorenal risk reduction in high-risk individuals regardless of glycemic status.⁵ Glucagon-like peptide 1 receptor agonists (GLP-1 RA) and/or sodium-glucose cotransporter 2 inhibitors (SGLT2i) are prioritized based on established ASCVD, high risk for ASCVD (> 55 years of age with two or more risk factors including obesity, hypertension, smoking, dyslipidemia, or albuminuria), HF, or CKD. Sodium-glucose cotransporter 2

inhibitors with labeled indications or published evidence supporting benefit are the preferred agents in persons with HF or CKD. However, due to reduced glycemic benefit of the SGLT2i agents at estimated glomerular filtration rates (eGFR) rates < 45 ml/min, GLP-1 RAs are preferred for glycemic management in persons with more advanced CKD (eGFR < 30 ml/min). GLP-1 RA drugs with labeled indications or published evidence of benefit are recommended at the same level as SGLT2i in persons with ASCVD (established or at risk), or in combination if a person has CKD. Alternatively, pioglitazone may be considered for secondary prevention of ASCVD in combination with either a GLP-1 RA or SGLT2i (with labeled indication or published evidence for benefit) if there is no concomitant diagnosis of heart failure.

The right pathway of the algorithm recommends initiation of drug therapy for glycemic management and for achievement and maintenance of weight management goals.⁵ The first column indicates medications with the greatest ability to lower A1C, including the most potent agents of insulin, tirzepatide (dual GLP-1 RA/glucose-dependent insulinotropic

polypeptide [GIP] agent), semaglutide, high dose dulaglutide, or medication combinations. The next highest A1C-lowering may be achieved with exenatide, metformin, SGLT2i, sulfonyleureas, or pioglitazone; dipeptidyl peptidase 4 inhibitors (DPP4i) and alpha-glucosidase inhibitors have lower ability to reduce A1C. The second column is a notable update for the guidelines to include larger body size/obesity and weight management as a significant consideration. Weight loss recommendations for people with type 2 diabetes were intensified in section 8 of the guidelines and added specifically into Figure 9.3. The initial weight loss target is 5% to 10% of body weight, and a 10-15% loss can be an additional goal for potential diabetes remission. This can be pursued through intensive evidence-based, structured programs with consideration for metabolic surgery when indicated. The glucose-lowering medication with the highest weight loss efficacy is tirzepatide followed by drugs in the GLP-1 RA class: semaglutide > dulaglutide/liraglutide > exenatide. Weight reduction is also possible with agents in the SGLT2i class, though a smaller amount of weight loss is expected.

TABLE 1. General Glycemia Goals for Different Populations^{1,9-10,14,19,20,22}

Target	Youth and Non-pregnant Adults		Older Adults		Pregnant Adults
	AACE ^{9,10}	ADA ^{1,14}	ADA ¹⁹	ES ²⁰	
A1C Individualized	< 6.5%	< 7%	< 7% to 8%	< 7.5% to < 8.5%	< 6%
Fasting Glucose	< 110 mg/dL	80-130 mg/dL	80-180 mg/dL	90-180 mg/dL	70 - 95 mg/dL
One-hour Postprandial Glucose	Not stated		Not stated		110 -140 mg/dL
Two-hour Postprandial Glucose	< 140 mg/dL	< 180 mg/dL	Not stated		100 - 120 mg/dL
Bedtime	Not stated		80-200 mg/dL	90-250 mg/dL	Not stated
CGM Parameters	ADA^{1,14} (non-pregnant adults only; no youth CGM goals)		ADA^{1,14}		ADA²²
Target Range	70 - 180 mg/dL (goal > 70% of time)		70 - 180 mg/dL (goal >50% of time)		63 -140 mg/dL (goal > 70% of time)
Below Range	< 70 mg/dL (goal < 4% of time)		<70 mg/dL (goal < 1% of time)		< 63 mg/dL (goal < 4% of time)
Significantly Below Range	< 54 mg/dL (goal < 1% of time)		<54 mg/dL (goal < 1% of time)		< 54 mg/dL (goal < 1% of time)
Abbreviations: A1C = hemoglobin A1C, AACE = American Association of Clinical Endocrinology, ADA = American Diabetes Association, CGM = continuous glucose monitor, ES = Endocrine Society					

In the context of cardiovascular risk factor management, strategies to detect and optimize risk factors are crucial.⁵ This includes screening, surveillance, and management to meet goals for blood pressure, lipids, antithrombotic needs, and support for tobacco cessation. Cardiorenal protection is also a significant consideration, and initiating a glucose-lowering medication with evidence for protection is recommended regardless of A1C values for individuals with established or high risk for ASCVD, HF, or CKD. Specific agents within the SGLT2i class have gained FDA approval for use in patients with or without diabetes for the indications of HF (dapagliflozin, empagliflozin) and CKD (dapagliflozin, empagliflozin).^{6,7} In addition, new data is emerging regarding the potential impact of GLP-1 RAs in persons with HF.⁸ Table 2 lists the current agents with supporting evidence and FDA approval for current compelling indications within each class.^{1,9-10}

Additional sections of the ADA guideline address two more compelling indications for certain glucose-lowering therapies. Section 4 includes subsections about assessment and management of several diabetes comorbidities, including nonalcoholic fatty liver disease (NAFLD).¹¹ Pioglitazone, liraglutide, and subcutaneous semaglutide are beneficial medications for people with type 2 diabetes and NAFLD. Section 10 is about cardiovascular disease and risk management, and table 10.3B details primary and secondary outcomes for 6 cardiovascular and cardiorenal trials published after the FDA required cardiovascular outcome reporting beginning in 2008.¹² Secondary outcomes for subcutaneous semaglutide and dulaglutide reveal beneficial effects for stroke risk reduction.

The American Association of Clinical Endocrinology (AACE)

Clinical Practice Guidelines and Comprehensive Type 2 Diabetes Management Algorithm

The American Association of Clinical Endocrinology Clinical Practice Guidelines on type 2 diabetes mellitus were updated in 2022, with a new algorithm released in May of 2023.^{9,10} The most recent version is

TABLE 2. Current Agents with Evidence for Cardiorenal Protection^{1,9,10}

ASCVD Evidence		CKD Evidence		HF Evidence	Stroke/TIA Evidence (AACE)
GLP-1 RA: Dulaglutide Liraglutide Semaglutide	SGLT2i: Canagliflozin Dapagliflozin Empagliflozin	SGLT2i: Canagliflozin Dapagliflozin* Empagliflozin* <i>Start regardless of A1C: If eGFR > 20 ml/min and UACR > 30 mg/g</i>	GLP-1 RA: Dulaglutide Liraglutide Semaglutide <i>(Driven by albuminuria outcomes)</i>	SGLT2i: Canagliflozin Dapagliflozin* Empagliflozin* Ertugliflozin	GLP-1 RA: Dulaglutide Semaglutide
					TZD: Pioglitazone
<small>*approved to use even in the absence of diabetes mellitus Abbreviations: AACE = American Association of Clinical Endocrinology, ASCVD = atherosclerotic cardiovascular disease, CKD = chronic kidney disease, eGFR = estimated glomerular filtration rate, GLP-1 RA = glucagon-like peptide 1 receptor agonist, HF = heart failure, SGLT2i = sodium-glucose cotransporter 2 inhibitor, TIA = transient ischemic attack, TZD = thiazolidinedione, UACR = urine albumin-creatinine ratio</small>					

similar to the ADA updates with additional emphasis regarding cardiorenal protection, the prominent role of weight loss, and the importance of prediabetes identification and management to reduce risk of progression to type 2 diabetes.

The main differences between AACE and ADA recommendations for glycemic management include a more aggressive approach by AACE: an optimal A1C goal of < 6.5% (Table 1), the earlier use of dual and triple therapy, and the inclusion of all potential drug therapies (including low efficacy drugs with potential safety concerns) within the AACE algorithm.¹⁰ In addition to the ADA recommended agents within the GLP-1 RA, SGLT2i, DPP4i, and thiazolidinedione (TZD) medication classes, AACE includes sulfonylureas, glinides, colesevelam, bromocriptine, and alpha-glucosidase inhibitors for consideration as part of less preferred dual and triple therapy.^{9,10} The American Association of Clinical Endocrinology indicates these last seven categories and agents are not preferred choices. The AACE 2023 updates separate out medication recommendations into two algorithms for drug therapy choices: a complications-centric algorithm (comparable to the left side of the ADA algorithm), and a glucose-centric algorithm (similar to the right side of the ADA algorithm). In addition, the AACE algorithm includes stroke/transient ischemic attack (pioglitazone, semaglutide or dulaglutide are suggested) and NAFLD as compelling indications to consider (with recommendations to consider pioglitazone).

The AACE Algorithm is an excellent

resource to pare down the wealth of considerations for a clinician to make as part of comprehensive care into eleven separate tools, each addressing specific aspects of care that are congruent with ADA, EASD (Figure 1).¹⁰

Guideline Recommendations for Special Populations

Management of Type 2 Diabetes in Youth

As the prevalence of type 2 diabetes in youth (age 10-18 years) continues to increase at a high rate, the ADA position statement (2018) and the yearly updated Standards of Care sections dedicated to youth are valuable resources.^{13,14} More recent changes in diabetes care guidelines for youth are based on data from the prospective longitudinal Treatment Options for Type 2 Diabetes in Adolescents and Youth trial (TODAY trial) that revealed youth-onset diabetes is different from diabetes in adulthood.^{15,16} Type 2 diabetes in youth tends to be a more aggressive condition with rapidly progressive insulin resistance and decline in beta cell function combined a higher incidence of early complications in young adulthood. The fifteen-year follow-up on the TODAY trial, where the average age of subjects was 26.4 +/- 2.8 years, showed worrisome statistics including:¹⁵

- Arterial stiffness and worsened cardiac function within 2 to 5 years of diagnosis
- Higher rate of treatment failures (predicted by an A1C > 6.2% at study entry)
- 80% incidence of at least one vascular

complication within 15 years

- » 68% incidence of hypertension (19% at study entry)
- » 52% incidence of dyslipidemia
- » 51% incidence of diabetic retinopathy (3.5% macular edema)
- » 55% incidence of diabetic nephropathy (8% at study entry)
- » 32% incidence of nerve disease
- In females: higher rate of preterm deliveries (43%), miscarriage, or fetal demise (25%)¹⁷

The ADA recommends risk-based screening starting at age 10 (or after the onset of puberty) in all overweight/obese youth with one or more additional risk factors for type 2 diabetes.^{14,18} Risk factors include:

- Maternal and/or family history of type 2 diabetes
- Race and ethnicity
- Signs of or health conditions associated with insulin resistance such as hypertension, acanthosis nigricans, polycystic ovary syndrome, etc.

In addition to the traditional screening, a panel of pancreatic autoantibodies should also be considered to rule out type 1 autoimmune diabetes.

Treatment recommendations and glycemic goals for youth are like those for adults (Table 1) and include lifestyle management, DSMES, and pharmacotherapy.¹⁴ Currently, the four FDA-approved medication classes for use in youth are: metformin, insulin, GLP-1RA, and SGLT2i (Table 3). Youth should also be assessed for cardiorenal risk factors, and treatment goals surrounding weight loss, blood pressure, lipids, and other complication management should be set accordingly. In addition, psychosocial care should include regular screening for diabetes distress, and any lower engagement in self-management behavior should be addressed.

Management of Diabetes in Older Adults

The annual ADA Standards of Care include a section titled “Older Adults,” and the Endocrine Society published its own clinical practice guideline in 2019 for the treatment of diabetes for adults over the age of 65.^{19,20} Since nearly 30% of Americans with diabetes are over the age of 65,²¹ it is pertinent to consider these recommendations. Both guidelines provide formal guidance on the importance of

FIGURE 1. AACE Algorithm Overview



assessing the person's overall health and personal values prior to the determination of treatment goals and strategies.^{19,20} The ADA recommends an individualized approach to setting A1C goals for older adults to be less stringent in persons with multiple coexisting chronic illnesses, cognitive impairment, or functional limitations.¹⁹ More aggressive glycemia goals can be considered in otherwise healthy older adults with few coexisting chronic illnesses, intact cognitive function, and functional status (Table 1).

Similarly, the Endocrine Society guideline recommends different clinical targets for fasting, bedtime, and A1C goals based on overall health, person-centered values, and hypoglycemia risk.²⁰

Good health:

- No comorbidities OR 1-2 non-diabetes long-term conditions AND no activities of daily living (ADL) impairments and 0 to 1 instrumental activities of daily living (IADL) impairment
- A1C goal less than 7.5%

Intermediate health:

- 3 or more non-diabetes long-term conditions and/or any one of: mild cognitive impairment or early dementia, 2 or more IADL impairments
- A1c goal less than 8%

Poor health:

- Any one: end-stage medical condition(s), moderate to severe dementia, 2 or more ADL impairments, living in a long-term care facility
- A1C goal less than 8.5%

TABLE 3. Antihyperglycemic Medications for Special Populations^{1,14,19,22}

Drug Class	Approved Agents	Youth	Older Adults	Pregnancy	Notes
Biguanide	Metformin	Initial agent of choice for A1C < 8.5%, with normal kidney function and no acidosis/ketosis	First-line	<ul style="list-style-type: none"> • Second line • Avoid if HTN, preeclampsia, or at risk for intrauterine growth restriction 	<ul style="list-style-type: none"> • Vitamin B12 monitoring with long-term use • Adjust dose per eGFR
Sodium glucose co-transporter 2 inhibitor	Bexagliflozin Canagliflozin Dapagliflozin Empagliflozin Ertugliflozin	Empagliflozin approved to lower blood glucose with diet and exercise in children ≥ 10 years	<ul style="list-style-type: none"> • Second line • Caution with UTI and incontinence • Fracture risk with canagliflozin 	Contraindicated due to increase in miscarriages and congenital malformations	<ul style="list-style-type: none"> • CVD, HF, CKD risk reduction • Caution with volume depletion and rare ketoacidosis • HOLD with severe illness (DKA risk)
Glucagon-like-peptide-1 receptor agonist	Dulaglutide Exenatide Liraglutide Semaglutide	Approved for use: <ul style="list-style-type: none"> • Dulaglutide • Exenatide ER • Liraglutide • Semaglutide: Wegovy® brand only (not Ozempic®) 	<ul style="list-style-type: none"> • Second line • Not preferred in people with unexplained weight loss 	Contraindicated due to reduced fetal growth and decreased weight	CVD risk reduction, potential weight loss
Dipeptidyl peptidase 4 inhibitors	Alogliptin Linagliptin Sitagliptin	Not approved for use	Second-line	Not recommended due to no available human studies	<ul style="list-style-type: none"> • No CVD efficacy • Well-tolerated
Sulfonylurea	Glimepiride Glipizide Glyburide	Not approved for use	Hypoglycemia risk: use cautiously	<ul style="list-style-type: none"> • If used, glyburide preferred within class • Potential risk of neonatal hypoglycemia 	<ul style="list-style-type: none"> • Hypoglycemia risk • Weight gain • Lack of positive CVD outcomes data
Thiazolidinedione	Pioglitazone	Not approved for use	<ul style="list-style-type: none"> • Use cautiously, if at all • Lowest doses to mitigate edema 	Contraindicated due to teratogenic effects	Risks of heart failure, osteoporosis, falls or fractures, and/or macular edema
Basal insulin	Insulin glargine Insulinb degludec	Use with: <ul style="list-style-type: none"> • marked hyperglycemia (BG > 250 mg/dL) • A1C > 8.5% and symptomatic 	<ul style="list-style-type: none"> • Use cautiously • Requires visual and motor skills and cognitive ability 	First-line	Start basal insulin and titrate
Prandial insulin	Regular Insulin aspart Insulin glulisine Insulin lispro		<ul style="list-style-type: none"> • Use cautiously • Requires visual and motor skills, and cognitive ability 		Consider starting 1 dose with largest meal and add other meal doses if needed

Abbreviations: A1C = hemoglobin A1C, BG = blood glucose, CKD = chronic kidney disease, CVD = cardiovascular disease, DKA = diabetes-related ketoacidosis, eGFR = estimated glomerular filtration rate, HF = heart failure, HTN = hypertension, UT = urinary tract infection, UTI= urinary tract infection

Specific Endocrine Society treatment recommendations for older adults are less complex compared to other guidelines but do provide important considerations. The guideline recommends that outpatient diabetes regimens for people aged 65 years and older should be designed specifically to minimize hypoglycemia.²⁰ Minimizing hypoglycemia is particularly important in people older than 65 years since hypoglycemia appears to increase the risk of traumatic falls and has been associated with morbidity and mortality in older adults in post hoc analyses of large clinical trials. Similarly, the ADA guidelines recommend the following: 1) using medication classes with low risk of hypoglycemia, 2) avoiding overtreatment of diabetes, 3) de-intensifying treatment goals, and 4) simplifying complex treatments.¹⁹ To lower the risk of hypoglycemia, the following is recommended by the Endocrine Society: 1) avoidance of sulfonylureas (SUs) and glinides, 2) using insulin sparingly, and 3) simplifying regimens.²⁰ Medication recommendations by class with rationale can be viewed in Table 3.

Management of Diabetes in Pregnancy

Both the ADA and AACE have sections dedicated to the management of diabetes in pregnancy.^{9,22} The 2024 ADA Standards of Care note the increasing prevalence of gestational diabetes mellitus (GDM) in the United States is parallel with the increases in diagnosis of types 1 and 2 diabetes and obesity.²² The term “gestational diabetes” means diabetes that was not known to exist prior to pregnancy. Uncontrolled diabetes is associated with increased risks for maternal complications such as spontaneous abortion and preeclampsia in addition to fetal anomalies, macrosomia, neonatal hypoglycemia, hyperbilirubinemia, and respiratory distress syndrome. Additionally, offspring are at increased risk of obesity, hypertension, and type 2 diabetes later in life.

The main goal of diabetes treatment in pregnancy is to maintain euglycemia without frequent hypoglycemia.²² Although A1C goals should be individualized, optimal outcomes have been observed with an A1C goal of less than 6%. This goal is recommended due to increased red blood cell turnover during pregnancy that results in a slightly lower A1C. An alternate goal

would be A1C less than 7%. Blood glucose targets are also more stringent in GDM compared to non-pregnant adults with type 2 diabetes. For a comparison of the target ranges for diabetes in pregnancy, see Table 1.

Current data support the use of CGM in pregnant people with type 1 diabetes.^{9,22} Although there are no randomized controlled trials to support the use of CGM in type 2 or gestational diabetes, it is a powerful tool to help a person with diabetes manage their care and understand the effects of various factors (e.g. food and exercise choices, stress, sleep, etc.) on their approximate, real-time glucose values.

Few pharmacologic therapies are available for managing diabetes in pregnancy. Currently, insulin is first-line therapy for management of diabetes (type 1, 2, or gestational) because insulin does not cross the placenta.^{9,22} Metformin and glyburide are no longer recommended first-line therapy in pregnancy because they do cross the placenta. See Table 3 for information about other medications in pregnancy.

Another medication consideration involves assessment of preeclampsia risk, which might indicate the necessity of daily low dose aspirin starting at 12 to 16 weeks of gestation.²² People with diabetes of childbearing potential who use reliable contraception may use statins and agents that affect the renin-angiotensin system, although these agents should be avoided during pregnancy.

Family planning is a crucial consideration for people with diabetes, as it involves careful management and coordination to ensure a safe and healthy pregnancy. Individuals with pre-existing diabetes should work closely with their healthcare team to develop a personalized family planning strategy that optimizes blood glucose and minimizes potential risks.²² Effective family planning can help individuals with diabetes achieve their reproductive goals while safeguarding their own and their child's well-being.

Medication considerations are an important aspect of family planning. GLP-1 RA can cause decreased absorption of oral contraceptives due to delayed gastric emptying, which progressively increases with higher GLP-1RA doses and could potentially lead to unplanned pregnancy.^{22,23} In addition, the longer half-life of GLP-1

RA means that even when pregnancy occurs and the drug is discontinued, there is a lingering amount of drug still in the body. For persons of childbearing potential, it is prudent to discuss alternate methods of birth control, specifically when starting or adjusting the dose of a GLP-1 RA. Spacing the oral contraceptive dose from the time of daily GLP-1 RA injections has been suggested.²⁴ Primary and secondary forms of birth control that would not be affected by delayed absorption (intrauterine device, barrier methods, etc.) could be offered. A recent systematic review, however, suggests that overall bioavailability of combined oral contraceptives may not be affected by GLP-1 RA.²⁵

Conclusion

The guidelines reviewed in this article have differences and nuances; however, there are several themes that underscore comprehensive diabetes care. All guidelines emphasize the importance of providing individualized care to people with diabetes by adapting the treatment plan to each person's specific needs based on age, comorbidities, risk of hypoglycemia, and goals of therapy. Since there is not a one-size-fits-all approach to diabetes management, staying informed with guideline updates can enhance the delivery of patient-centered care.

Denise Walbrandt Pigarelli is an Associate Professor (CHS) at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. Francesca Johnson is an Assistant Clinical Professor at Marquette University Department of Physician Assistant Studies in Milwaukee, WI. Elizabeth Buckley is a Professor of Pharmacy Practice at Concordia University Wisconsin School of Pharmacy in Mequon, WI. Joseph Dutzy is an Assistant Professor of Pharmacy Practice at Concordia University Wisconsin School of Pharmacy in Mequon, WI.

Corresponding Author:
Denise Walbrandt Pigarelli -
denise.pigarelli@wisc.edu

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

Disclosure: The authors declare no relevant relationships, real or potential, with ineligible companies or product(s) or service(s) mentioned

in the manuscript, including grants, equipment, medications, employment, gifts, and honoraria.

References

1. American Diabetes Association Professional Practice Committee. Standards of care in diabetes—2024. *Diabetes Care*. 2023;47(suppl 1):S1-S308. doi:10.2337/dc24-SINT
2. American Diabetes Association. Standards of care in diabetes—2024. *DiabetesPro*. December 2023. Accessed January 18, 2024. https://diabetesjournals.org/care/issue/47/Supplement_1
3. Standards of Care App | American Diabetes Association. Accessed January 18, 2024. <https://professional.diabetes.org/standards-of-care/standards-care-app>
4. Davies MJ, Aroda VR, Collins BS, et al. Management of hyperglycemia in type 2 diabetes, 2022. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care*. 2022;45(11):2753-2786. doi:10.2337/dci22-0034
5. American Diabetes Association Professional Practice Committee. 9. Pharmacologic approaches to glycemic treatment: standards of care in diabetes—2024. *Diabetes Care*. 2023;47(suppl 1):S158-S178. doi:10.2337/dc24-S009
6. Farxiga. Prescribing information. AstraZeneca; 2014. Accessed February 29, 2024. <http://www.azpicentral.com/pi.html?product=farxiga>
7. Jardiance. Prescribing information. Boehringer Ingelheim; 2014. Accessed February 29, 2024. <https://content.boehringer-ingelheim.com/DAM/7d9c411c-ec33-4f82-886f-af1e011f35bb/jardiance-us-pi.pdf>
8. Kosiborod MN, Abildstrom SZ, Borlaug BA, et al. Semaglutide in patients with heart failure with preserved ejection fraction and obesity. *N Engl J Med*. 2023;389(12):1069-1084. doi:10.1056/NEJMoa2306963
9. Blonde L, Umpierrez GE, Reddy SS, et al. American Association of Clinical Endocrinology clinical practice guideline: developing a diabetes mellitus comprehensive care plan—2022 Update. *Endocr Pract*. 2022;28(10):923-1049. doi: 10.1016/j.eprac.2022.08.002
10. Samson SL, Vellanki P, Blonde L, et al. American Association of Clinical Endocrinology consensus statement: comprehensive type 2 diabetes management algorithm – 2023 update. *Endocr Pract*. 2023;29(5):305-340. doi:10.1016/j.eprac.2023.02.001
11. American Diabetes Association Professional Practice Committee. 4. Comprehensive medical evaluation and assessment of comorbidities: standards of care in diabetes—2024. *Diabetes Care*. 2023;47(suppl 1):S52-S76. doi:10.2337/dc24-S004
12. American Diabetes Association Professional Practice Committee. 10. Cardiovascular disease and risk management: standards of care in diabetes—2024. *Diabetes Care*. 2023;47(suppl 1):S179-S218. doi:10.2337/dc24-S010
13. Arslanian S, Bacha F, Grey M, Marcus MD, White NH, Zeitler P. Evaluation and management of youth-onset type 2 diabetes: a position statement by the American Diabetes Association. *Diabetes Care*. 2018;41(12):2648-2668. doi:10.2337/dci18-0052
14. American Diabetes Association Professional Practice Committee. 14. Children and adolescents: standards of care in diabetes—2024. *Diabetes Care*.

ADDITIONAL RESOURCES

Guidelines included in this Article:

[American Diabetes Association Standards of Care in Diabetes - 2024](#)

[Management of Hyperglycemia in Type 2 Diabetes, 2022. A Consensus Report by the American Diabetes Association \(ADA\) and the European Association for the Study of Diabetes \(EASD\)](#)

[American Association of Clinical Endocrinology Clinical Practice Guideline: Developing a Diabetes Mellitus Comprehensive Care Plan – 2022 Update](#)

[American Association of Clinical Endocrinology Consensus Statement: Comprehensive Type 2 Diabetes Management Algorithm – 2023 Update](#)

2023;47(suppl 1):S258-S281. doi:10.2337/dc24-S014

15. TODAY Study Group, Bjornstad P, Drews KL, et al. Long-term complications in youth-onset type 2 diabetes. *N Engl J Med*. 2021;385(5):416-426. doi:10.1056/NEJMoa2100165
16. TODAY Study Group, Zeitler PA, Hirst K, et al. Clinical trial to maintain glycemic control in youth with type 2 diabetes. *N Engl J Med*. 2012;366(24):2247-2256. doi:10.1056/NEJMoa1109333
17. TODAY Study Group. Pregnancy outcomes in young women with youth-onset type 2 diabetes followed in the TODAY study. *Diabetes Care*. 2021;45(5):1038-1045. doi:10.2337/dc21-1071
18. American Diabetes Association Professional Practice Committee. 2. Diagnosis and classification of diabetes: standards of care in diabetes—2024. *Diabetes Care*. 2023;47(suppl 1):S20-S42. doi:10.2337/dc24-S002
19. American Diabetes Association Professional Practice Committee. 13. Older adults: standards of care in diabetes—2024. *Diabetes Care*. 2023;47(suppl 1):S244-S257. doi:10.2337/dc24-S013
20. LeRoith D, Biessels GJ, Braithwaite SS, et al. Treatment of diabetes in older adults: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*. 2019;104(5):1520-1574. doi:10.1210/jc.2019-00198
21. Statistics About Diabetes | ADA. Accessed September 29, 2022. <https://diabetes.org/about-us/statistics/about-diabetes>
22. American Diabetes Association Professional Practice Committee. 15. Management diabetes in pregnancy: standards of care in diabetes—2024. *Diabetes Care*. 2023;47(suppl 1):S282-S294. doi:10.2337/dc24-S015
23. Caution urged for obesity drugs and birth control pills. *Medscape*. Accessed January 12, 2024. <http://www.medscape.com/viewarticle/997498>
24. MOUNJARO® (tirzepatide) prescribing information. U.S. Approval: 2022. Accessed January 12, 2024. <https://uspl.lilly.com/mounjaro/mounjaro.html#pi>
25. Calvarysky B, Dotan I, Shepshelovich D, Leader A, Diker Cohen T. Drug-drug interactions between glucagon-like peptide 1 receptor agonists and oral medications: a systematic review. *Drug Saf*. Preprint posted online January 25, 2024. doi: 10.1007/s40264-023-01392-3

Assessment Questions

1. According to the American Diabetes Association, what is the initial recommended weight loss goal for patients with Type 2 Diabetes?
 - a. 5-10%
 - b. 10-15%
 - c. 15-20%
 - d. None of the above
2. Which of the following glucagon-like peptide 1 receptor agonists does not decrease chronic kidney disease endpoints?
 - a. Dulaglutide injected weekly
 - b. Exenatide injected weekly
 - c. Liraglutide injected daily
 - d. Semaglutide injected weekly
3. Which of the following sodium-glucose cotransporter 2 inhibitors does not reduce the risk of atherosclerotic cardiovascular disease?
 - a. Canagliflozin
 - b. Dapagliflozin
 - c. Empagliflozin
 - d. None of the above
4. Which of the following glucagon-like peptide 1 receptor agonists has the best efficacy for weight loss in diabetes treatment?
 - a. Exenatide
 - b. Liraglutide
 - c. Dulaglutide
 - d. Semaglutide
5. Which of the following medications is recommended for the highest hemoglobin A1C-lowering efficacy?
 - a. Metformin
 - b. Exenatide
 - c. Insulin
 - d. Dapagliflozin

6. According to the American Association of Clinical Endocrinology, which medication is recommended for patients with a comorbidity of stroke?
 - a. Metformin
 - b. Dapagliflozin
 - c. Pioglitazone
 - d. There are no recommendations for stroke

7. Based on the Endocrine Society guideline for the treatment of diabetes for adults older than 65 years, which of the following is recommended to reduce the risk of hypoglycemia?
 - a. If sulfonylureas must be used, glyburide is preferred
 - b. Use insulin sparingly
 - c. Multi-drug regimens are preferred
 - d. None of the above

8. Which of the following medications are NOT approved for youth?
 - a. Empagliflozin
 - b. Metformin
 - c. Liraglutide
 - d. Tirzepatide

9. Which of the following medications is correctly matched with a consideration for use in adults older than 65 years?
 - a. Sitagliptin– associated with heart failure
 - b. Pioglitazone –be cautious with volume depletion
 - c. Glipizide- if a sulfonylurea must be used, this is one is preferred
 - d. Insulin –basal + bolus is the preferred insulin regimen

10. What is the goal for fasting blood glucose in pregnancy?
 - a. 70–95 mg/dL
 - b. 80-130 mg/dL
 - c. 110–140 mg/dL
 - d. 100–120 mg/dL

CE FOR PHARMACISTS & TECHNICIANS

Continuing Education Credit Information



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

May/June 2024

Dynamic Diabetes Updates: Current Management Guidelines for Type 2 Diabetes

**ACPE Universal Activity Number:
0175-0000-24-081-H01-PT**

Target Audience: Pharmacists

Activity Type: Knowledge-based

Release Date: May 1, 2024

(No longer valid for CE credit after May 1, 2027)



Submit Your CE Online
www.pswi.org/Education/Journal-CE

REGISTRATION NOW OPEN!

2024

PSW Annual Meeting

August 22-24, 2024

Kalahari Resort & Convention Center

Wisconsin Dells

POWERING

PROGRESS

Impact of a Pharmacist Led Comprehensive Medication Management Program in Patients with Diabetes in a Rural Health Care Setting

by Taylor DeBoer, PharmD, Rachel Kopfhamer, PharmD, Christina Kellar, PharmD, Joshua Lee, PharmD, BCACP, Katherine Nichols, PharmD, BCACP, Sara Griesbach, PharmD, BCPS, BCACP

Diabetes is a chronic disease that continues to be of great concern in the United States, with 37 million people living with diabetes in 2022.¹ This equates to about 1 in 10 Americans diagnosed with diabetes. Of the 37 million patients diagnosed with diabetes, approximately 90-95% have type 2 diabetes.² Diabetes comes with a substantial medical cost burden, estimated around \$327 billion in medical costs and lost wages. When compared to those without a diagnosis of diabetes, patients with diabetes have more than twice the medical costs, along with an increased risk for blindness, kidney failure, heart disease, stroke, and amputation.

There is an increased risk for complications in patients with diabetes, and it was the seventh leading cause of death in the United States in 2023.² Fortunately, treatment options are available that can help manage diabetes and minimize the risk of micro- and macrovascular complications.³ Lifestyle and behavior modifications with diet and exercise have shown benefit and reduce the need for oral and injectable diabetes medications. Unfortunately, non-pharmacologic interventions require great motivation from the patient, and studies have shown there is great diversity in motivation levels of patients when adhering to these regimens.⁴ When focusing on pharmacologic approaches, there are numerous options that continue to expand. Even with various treatment options, patients can still experience inadequate blood glucose control and an inability to reach target goals of therapy.

The inability to reach treatment goals results from complex medication regimens that cause unwanted adverse drug effects, financial burden, poor medication adherence, or confusion for the patient.

Abstract

Background: Pharmacists providing care in rural areas help increase healthcare access for patients. Further integration of pharmacists into the healthcare team helps patients meet their treatment goals and reduce financial burdens. The Marshfield Clinic Health System (MCHS) Diabetes Care Management program aims to provide high-quality, patient-centered care to enrolled patients through comprehensive medication management (CMM) services. Continued analysis of the Diabetes Care Management program is crucial for understanding the impact pharmacists have on patients with diabetes and determining the feasibility of expanding this service system wide.

Methods: As a quality improvement project, this initiative was exempted by the Institutional Review Board. The primary outcome of this study was to analyze the change in hemoglobin A1c (HbA1c) in patients with uncontrolled type 2 diabetes contacted by a pharmacist. A pharmacist provided CMM services and performed a medication reconciliation telephonically with the patient. Pharmacists identified medication-related problems and offered recommendations to the provider. Pharmacists performed follow-up telephone calls to assess each patient's tolerance for medication therapy and additional opportunities to optimize the patient's medication regimen. Secondary outcomes included evaluation of change in blood pressure, change in low-density lipoprotein (LDL) cholesterol, change in hospitalizations, and proportion of patients that reached HbA1c < 8%.

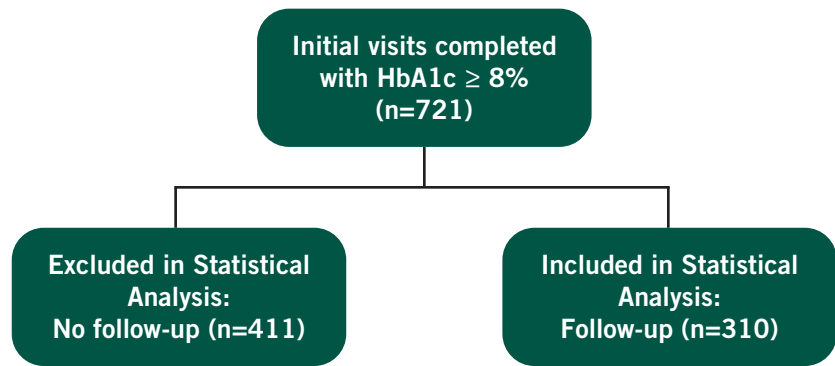
Results: There were 310 unique enrollments who completed at least one follow-up visit with a pharmacist and were included in the final statistical analysis. There was a statistically significant decrease in average change in HbA1c from baseline to most recent follow-up visits for patients enrolled in the MCHS Diabetes Care Management Program, which was -1.0% (95% CI: -1.2 to -0.8, p-value: <0.001).

Conclusions: The inclusion of a pharmacist on an interdisciplinary health care team showed a reduction in HbA1c values and other laboratory values that are important for patients with type 2 diabetes. As demonstrated in this quality improvement project, pharmacists are an integral component of a patient's health care team. Through comprehensive medication management services provided by pharmacists, patients diabetes management improved, decreasing their risk of health complications and medical costs.

Therapeutic inertia, known as a failure to start or increase drug therapy in an appropriate timeframe, has been shown to be another contributing factor in patients not reaching necessary therapy goals.⁵ Access to care and necessary follow-up has long been a barrier to patients reaching therapeutic goals, which is especially true in rural areas because of lack of access to resources, fewer community-based initiatives, lower health literacy, and financial burden.^{6,7} The increased burden in rural areas leads to higher morbidity, mortality, and economic losses for those patients with type 2 diabetes. Clinical pharmacists are strategically positioned to help bridge this gap and reduce the burden within rural areas for patients with type 2 diabetes.

Pharmacists are uniquely trained to perform comprehensive medication management (CMM) services with patients and help overcome the barriers they often encounter. Pharmacists working in

FIGURE 1. Patients Included in Study Analysis



this capacity alongside other health care providers are positioned to help patients better achieve their goals of therapy. Studies have shown the addition of a pharmacist to the multidisciplinary team has allowed a greater proportion of patients to meet goals of therapy pertaining to diabetes and other disease states.^{8,9} Pharmacists help recognize drug therapy opportunities; assess adverse effects, medication affordability, adherence,

medication administration technique; and provide overall patient education. All these factors can help to improve patient understanding and engagement, leading to increased treatment success of disease state management. Pharmacists' incorporation into the patient care team may help patients meet surrogate outcomes and goals that are often monitored for patients with type 2 diabetes, including hemoglobin A1c



(HbA1c), blood pressure, and low-density lipoprotein cholesterol (LDL cholesterol). Targeting the reduction in these surrogate markers helps decrease complications for patients with diabetes and the annual health care costs associated with these patients.

Studies have shown pharmacist addition to care teams leads to decreased health care costs, with one study showing 24% lower health care costs for diabetes patients during the first year when compared to those care teams without pharmacist involvement.¹⁰ Another study showed a 13% reduction in monthly medical costs for patients with diabetes within the treatment group that had a pharmacist incorporated.¹¹ Additionally, a study looking at hospital readmissions found patients with direct pharmacist involvement resulted in 9.8% of patients experiencing a readmission within 30 days of discharge compared to 20.4% of patients who did not receive direct pharmacist involvement.¹² Another study showed a 1% reduction in HbA1c equates to a 2% reduction in all health care costs.¹³ These results emphasize the importance of the pharmacist on the multidisciplinary team and that the presence of a pharmacist can help decrease the high medical costs commonly accrued in patients with diabetes.

Pharmacists are a vital piece of a patient's health care team, and further integration within this team will help patients meet necessary treatment goals and reduce medical financial burden. Pharmacists providing care to patients in rural areas allow for another touchpoint and additional health care access for patients, optimizing patient care and ensuring the highest quality of care is provided. The Diabetes Care Management pilot program within

Marshfield Clinic Health System (MCHS) aims to continue to provide the best care possible to its patients with diabetes by optimizing the use of pharmacists and their role in CMM. The purpose of this project is to conduct an analysis of the Diabetes Care Management program to evaluate the impact on patients enrolled and the feasibility of continuing to expand this program.

Methods

This quality improvement project was determined to be exempt from oversight by the Institutional Review Board. Marshfield Clinic Health System includes more than 60 Clinic locations, 11 hospitals, Marshfield Children's Hospital and Marshfield Clinic Research Institute, all located throughout the state of Wisconsin and Michigan's Upper Peninsula.

Patients 18 years or older with uncontrolled type 2 diabetes, defined as HbA1c \geq 8%, being followed by providers throughout MCHS from August 2019 through December 2023 were identified and offered enrollment in this quality improvement project (Figure 1). Patients were excluded in the final analysis if at least one follow-up visit was not completed within one year of their initial visit with a pharmacist.

Eligible patients were flagged for pharmacist review. The pharmacist would then provide CMM services telephonically to the patient and send electronic communications to their provider regarding drug therapy opportunities (DTOs). The pharmacist completed follow-up calls every 3 to 6 months to assess drug therapy changes and to identify additional DTOs. Patients continued to be evaluated by their

TABLE 1. Baseline Characteristics of Patients Included in Final Statistical Analysis

Characteristic	Follow-up (n = 310)
Age (years)	66.8 \pm 12.8
Initial HbA1c (%)	9.3 \pm 1.5
Initial systolic BP (mmHg)	132 \pm 17
Initial diastolic (mmHg)	74 \pm 10
BP < 140/90 mmHg (%)	232 (74.8)
Initial LDL (mg/dL)	82.2 \pm 39.2
Appropriate statin intensity (%)	186 (80.5)
Hospitalizations	0.3 \pm 0.9
Hypoglycemia	
Never	194 (67.4)
Yearly	25 (8.7)
Monthly	41 (14.2)
Weekly	28 (9.7)
Barriers	
None	38 (12.3)
Knowledge	17 (5.5)
Practical issues	230 (74.2)
Motivation or self-efficacy	21 (6.8)
Insurance	
Medicare	185 (59.7)
Medicaid	47 (15.2)
Commercial	67 (21.6)
None/self-pay	3 (1.0)
<i>Mean \pm SD reported for continuous variables. Counts (%) reported for categorical variables. Complete-case analysis was used when missing data was present: initial LDL (n=21), appropriate statin (n=79), hospitalizations (n=214), hypoglycemia (n=22). Barriers and insurance are not mutually exclusive.</i>	

TABLE 2. Change in Outcomes From Baseline to Most Recent Follow-up Visit

Outcome	Initial Contact	Most Recent Contact	Average Difference	95% CI	p-value
HbA1c (%)	9.4 \pm 1.4	8.4 \pm 1.4	-1.0 \pm 1.6	(-1.2, -0.8)	<0.001
Systolic BP (mmHg)	132 \pm 17	128 \pm 13	-3.9 \pm 16.7	(-6.0, -1.8)	<0.001
Diastolic BP (mmHg)	74 \pm 10	72 \pm 10	-1.4 \pm 11.0	(-2.8, -0.01)	0.049
LDL Cholesterol (mg/dL)	82 \pm 39	71 \pm 31	-10.7 \pm 27.3	(-15.1, -6.4)	<0.001
Hospitalizations	0.3 \pm 0.9	0.1 \pm 0.4	-0.2 \pm 0.8	(-0.3, -0.02)	0.024
<i>A paired t-test was used to test whether the change from initial contact was different from zero. Mean paired difference, 95% CI and p-values were reported. Complete case analysis was used when missing data was present: most recent HbA1c (n=79), most recent BP (n=63), LDL (n=157), hospitalizations (n=214)</i>					

primary care provider (PCP) at regular intervals as determined by the provider.

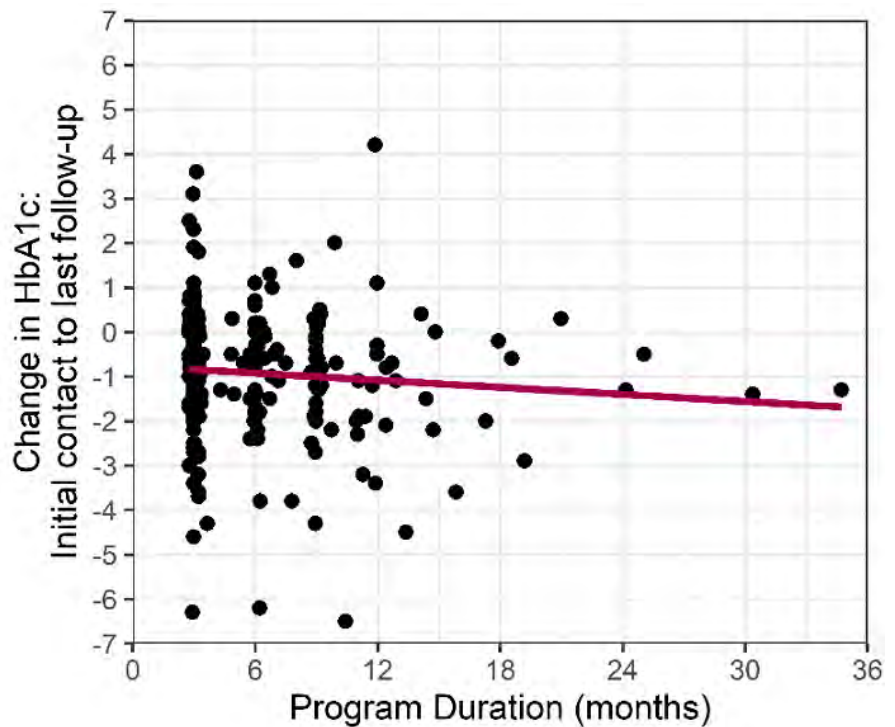
The pharmacist providing the CMM service conducted a medication history assessing for adverse drug effects, administration techniques, patient-reported blood glucose levels, adherence, comorbid disease states, and any barriers to care the patient may be experiencing. The CMM was completed prior to an upcoming PCP appointment. After providing telephonic calls, pharmacists identified any DTOs and provided recommendations to the PCP. Pharmacists documented their interaction and recommendations in the electronic medical record. The pharmacists focused on optimizing medication therapy for all patients' disease states to improve health outcomes and help patients meet their therapeutic goals.

As part of the telephonic visit, patients were mailed medication lists with action plans that included information discussed during their CMM visit and items for the patient to discuss with their PCP at their next scheduled appointment. The patient and PCP could then perform shared decision-making to consider the best way to proceed with therapy options. Patients were considered graduated from the program if their HbA1c decreased to < 8% or were considered unable to reach if they did not answer follow-up phone calls and/or a mailed letter.

All data were manually extracted from the MCHS electronic medical record through patient chart reviews to obtain laboratory values, vital signs, medication history, and other pertinent information. Data for DTOs that were electronically sent to providers was obtained through a tracking document managed by Clinical Pharmacy Services at MCHS.

The primary outcome was a change in HbA1c from initial CMM visit to last follow-up CMM visit. It was analyzed by comparing the baseline value from the patient's initial visit to the last value obtained while the patient was enrolled in the program to assess the effect of pharmacist intervention. Secondary outcomes include evaluation of the change in blood pressure, LDL cholesterol, hospitalizations, proportion of patients that reach HbA1c < 8%, blood pressure <140/90 mmHg, appropriate statin therapy, and correlation between program duration and

FIGURE 2. Change in HbA1C Based on Participant Duration within the Program



change in HbA1c.

Patient characteristics of unique enrollments (at least 1 year apart) were reported using means and standard deviation (SD) for continuous variables and counts and percentages for categorical variables. Differences in patient characteristics by follow-up were assessed using t-tests and chi-squared tests. Complete case analysis was used when missing data was present.

Among patients with follow-up, mean HbA1c, systolic and diastolic pressure, LDL cholesterol, and hospitalizations per year were reported at initial contact and most recent contact. A paired t-test was used to assess for changes in HbA1c, blood pressure, LDL cholesterol, and hospitalizations per year. Mean paired differences, 95% confidence intervals, and p-values were

reported. The proportion of patients meeting therapeutic goals (HbA1c <8%, BP <140/90 mmHg, appropriate statin) was reported at initial contact and most recent contact. The correlation between program duration, defined as time between most recent contact and initial contact, and reduction in HbA1c was assessed using Pearson's correlation coefficient. All analyses were completed in R version 4.1.1.¹⁴

Results

There were 721 unique enrollments from 686 unique patients that met inclusion criteria. Initial visits were completed between August 2019 and December 2023. There were 310 unique enrollments who completed at least one follow-up visit with a pharmacist and were included in the final statistical analysis (Figure 1).

TABLE 3. Percent of Patients Meeting Their Therapeutic Goals

Therapeutic Goal	Initial Contact	Most Recent Contact	Improvement
HbA1c < 8%	0%	37.7%	37.7
BP < 140/90 mmHg	74.8%	83.8%	9.0
Appropriate statin intensity	80.5%	87.9%	7.4
<i>Missing data present in the following: most recent BP (n=63), initial appropriate statin (n=79), most recent appropriate statin (n=70)</i>			

On average, included patients were 66.8 years old with an initial HbA1c of 9.3% (Table 1). Regarding therapeutic goals at baseline, no patients had an HbA1c of < 8%; 74.8% of patients had a blood pressure of < 140/90 mmHg, and 80.5% of patients were taking an appropriate intensity statin. Most patients experienced practical barriers, were insured through Medicare, and never had symptoms of hypoglycemia.

There was a statistically significant decrease in average change in HbA1c from baseline to most recent follow-up visits for patients enrolled in the MCHS Diabetes Care Management Program, which was -1.0% (95% CI: -1.2 to -0.8, p-value: <0.001).

Secondary Outcomes

Change in blood pressure: There was a statistically significant decrease in both the average change in systolic blood pressure and diastolic blood pressure from baseline to most recent follow-up visit for patients enrolled in the MCHS Diabetes Care Management Program of -3.9 mmHg (95% CI: -6.0 to -1.8, p-value: <0.001) and -1.4 mmHg (95% CI: -2.8 to -0.01, p-value: 0.049), respectively (Table 2).

Change in LDL cholesterol: There was a statistically significant decrease in average change in LDL cholesterol from baseline to most recent follow-up visits of -10.7 mg/dL (95% CI: -15.1 to -6.4, p-value: <0.001) (Table 2).

Change in hospitalizations: There was a statistically significant decrease in the average incidence of hospitalizations due to diabetes from one year prior to initial visit to one year after initial visit of -0.2 (95% CI: -0.3 to 0.02, p-value: 0.024) (Table 2).

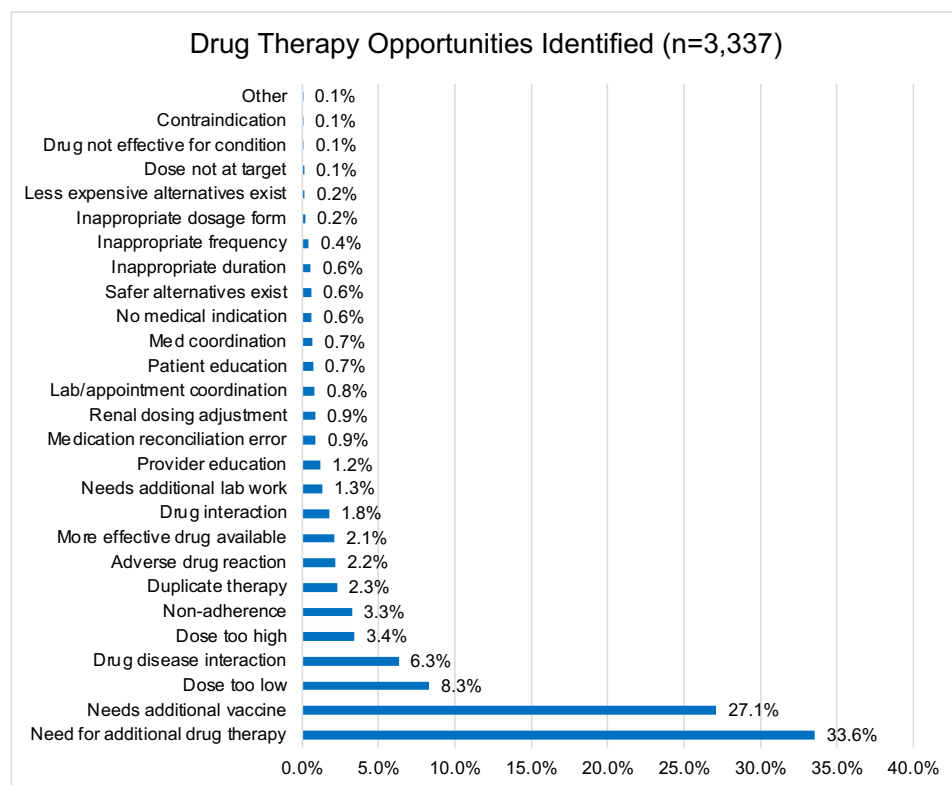
Proportion of Patients Meeting HbA1C Goal

At baseline, no patients were meeting an HbA1C goal of < 8%, and 37.7% were meeting HbA1C goal at most recent follow-up (Table 3).

Proportion of Patients Meeting Blood Pressure Goal

At baseline 74.8% of patients were meeting a BP goal < 140/90 mmHg, and 83.8% were meeting BP goal at most recent follow-up. An additional 9% of patients reached treatment goal.

FIGURE 3. Categories of DTOs Identified by Pharmacists



Proportion of Patients Taking Appropriate Statin Intensity

At baseline 80.5% of patients were taking an appropriate intensity statin, and 87.9% were taking an appropriate intensity statin at most recent follow-up. An additional 7.4% were taking appropriate intensity statin.

Correlation Between Program Duration and Change in HbA1c

Considering that each patient's treatment regimen was individualized and the complexity of type 2 diabetes varied among patients, each patient required a different number of visits with a pharmacist. The change in HbA1c from initial visit to most recent visit was compared to each patient's enrollment length within the Diabetes Care Management Program at MCHS. Reduction in HbA1c was not correlated with time in the CMM program ($r=-0.06$, $p=0.405$) (Figure 2).

Occurrence of DTOs and Acceptance/Refusal Rate

Among all patients who completed an initial telephonic visit with a pharmacist (n=721), there were 3,337 DTOs identified. Most of the DTOs identified involved a need for additional drug therapy or a need for additional vaccinations (Figure 3). Vaccinations that were reviewed include but are not limited to pneumococcal, influenza, and COVID-19. These vaccinations are important because they help prevent illnesses that can be further complicated by diabetes. DTOs were considered resolved if they resulted in patient or provider education, if the patient or provider refused the recommendation, or if the patient's medication therapy was changed based on the recommendation. At the time of statistical analysis, 3,059 DTOs were found to have resolutions and approximately 25% of DTO resolutions involved therapy change or education.

Discussion

The main objective of this quality improvement project was to determine the impact of a pharmacist as part of

an interdisciplinary health care team by assessing changes in patient outcomes. There were statistically significant reductions in average HbA1c, systolic blood pressure, and LDL cholesterol. With the pharmacists focusing on CMM services and on patient specific barriers, there was an increased proportion of patients obtaining their goals of therapy from initial visit to most recent follow-up visit. The correlation between program duration and change in HbA1c was weak and not statistically significant.

The involvement of a pharmacist in an interdisciplinary team allows for the contribution of specialized knowledge of medications that can provide additional insight into potential therapy options. The pharmacist has the expertise to provide necessary education to the patient on their medications and different patient-specific barriers. Previous studies have shown that patient education significantly improves medication adherence. Increased adherence is important, considering that medication use is one of the cornerstones for treating diabetes.¹⁵ Pharmacists were also able to educate providers, bringing forward that knowledge to additional patients. With the continued involvement of pharmacist staff and additional providers, the hope is to reach as many patients with uncontrolled type 2 diabetes within the system as possible and help them meet their goals of therapy.

This study has a few limitations to consider. There was no control arm involved in this project. A control arm would allow for a better picture of the exact benefit of the addition of a pharmacist to the healthcare team versus a team without one. Another potential limitation was pharmacists did not make direct medication changes without communicating with the prescribing provider. One final limitation to consider with this study was incomplete or inconsistent obtainment of laboratory values, so data had to be pulled forward from previous laboratory values, which may not have been a complete picture of the patient at a given time.

Conclusions

The inclusion of a pharmacist on an interdisciplinary health care team was associated with a reduction in HbA1c values and other laboratory values that are important for patients with type 2 diabetes. Pharmacists also helped educate patients

and obtain their goals of therapy. As patients reduce their HbA1c values and continue to meet their therapeutic goals, their risk of health complications and medical costs decreases.

Taylor DeBoer is a PGY-1 Pharmacy Resident at Marshfield Clinic Health System in Marshfield, WI. Rachel Kopfhamer is a Clinical Pharmacist at Marshfield Clinic Health System in Marshfield, WI. Christina Kellar is a Pharmacy Manager at Marshfield Clinic Health System in Marshfield, WI. Joshua Lee is a Clinical Pharmacy Specialist at Marshfield Clinic Health System in Marshfield, WI. Katherine Nichols is a Clinical Pharmacy Specialist at Marshfield Clinic Health System in Marshfield, WI. Sara Griesbach is the Director of Clinical Pharmacy Services at Marshfield Clinic Health System in Marshfield, WI.

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

Corresponding Author: Sara Griesbach - griesbach.sara@marshfieldclinic.org

Acknowledgments: Rachel Gabor – Biostatistician III and Carolyn Ostrander, MD

Disclosure: 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.

References

1. A snapshot: diabetes in the United States. Centers for Disease Control and Prevention. www.cdc.gov/diabetes/library/socialmedia/infographics/diabetes.html. 2022. Accessed September 15, 2023.
2. Faststats - leading causes of death. Centers for Disease Control and Prevention. <https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>. 2023. Accessed September 15, 2023.
3. Wang X, Kang J, Liu Q, Tong T, Quan H. Fighting diabetes mellitus: pharmacological and non-pharmacological approaches. *Curr Pharm Des*. 2020;26(39):4992-5001. doi:10.2174/1381612826666200728144200
4. Sebire SJ, Toumpakari Z, Turner KM, et al. "I've made this my lifestyle now": a prospective qualitative study of motivation for lifestyle change among people with newly diagnosed type two diabetes mellitus. *BMC Public Health*. 2018;18(1):204. Published 2018 Jan 31. doi:10.1186/s12889-018-5114-5
5. Khunti K, Gomes MB, Pocock S, et al. Therapeutic inertia in the treatment of hyperglycaemia in patients with type 2 diabetes: A systematic review. *Diabetes Obes Metab*. 2018;20(2):427-437. doi:10.1111/dom.13088
6. Aljassim N, Ostini R. Health literacy in rural and urban populations: A systematic review. *Patient Educ Couns*. 2020;103(10):2142-2154. doi:10.1016/j.pec.2020.06.007
7. Dugani SB, Mielke MM, Vella A. Burden and management of type 2 diabetes in rural United States. *Diabetes Metab Res Rev*. 2021;37(5):e3410. doi:10.1002/dmrr.3410
8. Pousinho S, Morgado M, Plácido AI, Roque F, Falcão A, Alves G. Clinical pharmacists' interventions in the management of type 2 diabetes mellitus: a systematic review. *Pharm Pract (Granada)*. 2020;18(3):2000. doi:10.18549/PharmPract.2020.3.2000
9. Rodriguez de Bittner M, Chirikov VV, Breunig IM, Zaghaf RW, Shaya FT. Clinical effectiveness and cost savings in diabetes care, supported by pharmacist counselling. *J Am Pharm Assoc*. 2017;57(1):102-108.e4. doi:10.1016/j.japh.2016.08.010
10. Bansal M, Shah M, Reilly B, Willman S, Gill M, Kaufman FR. Impact of reducing glycated hemoglobin on healthcare costs among a population with uncontrolled diabetes. *Appl Health Econ Health Policy*. 2018;16(5):675-684. doi:10.1007/s40258-018-0398-2
11. Maeng DD, Graham J, Bogart M, Hao J, Wright EA. Impact of a pharmacist-led diabetes management on outcomes, utilization, and cost. *Clinicoecon Outcomes Res*. 2018;10:551-562. doi.org/10.2147/CEOR.S174595
12. Shull MT, Braitman LE, Stites SD, DeLuca A, Hauser D. Effects of a pharmacist-driven intervention program on hospital readmissions. *Am J Health Syst Pharm*. 2018;75(9):e221-e230. doi:10.2146/ajhp170287
13. Lage MJ, Boye KS. The relationship between HbA1c reduction and healthcare costs among patients with type 2 diabetes: evidence from a U.S. claims database. *Curr Med Res Opin*. 2020;36(9):1441-1447. doi:10.1080/03007995.2020.1787971
14. R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
15. Taibanguay N, Chaiamnuay S, Asavatanabodee P, Narongroeknawin P. Effect of patient education on medication adherence of patients with rheumatoid arthritis: a randomized controlled trial. *Patient Prefer Adherence*. 2019;13:119-129. doi:10.2147/PPA.S192008

Incorporating a Student Pharmacist in the Deprescribing Process for Long-Term Care Patients

by Jenna N Harnish, 2025 PharmD Candidate,
Mara A Kieser, MS, RPh, BCGP



Polypharmacy is defined as the use of five or more medications and is highly prevalent in long-term care facilities (LTCFs).^{1,2} Due to the increase in prescribed medications, patients are at an increased risk of receiving a potentially inappropriate medication (PIM). These PIMs have multiple safety risks that outweigh the benefits for most older adults.³ These risks include poor medical outcomes such as increases in emergency department visits, hospital admissions, disability, and morbidity.^{4,5}

Older adults are particularly affected by poor medical outcomes due to a higher likelihood of having multiple chronic conditions such as high blood pressure, high cholesterol, and diabetes compared to younger adults.⁴ This can lead to an increased pill burden for older adults as additional medications are prescribed to help manage and treat multiple chronic conditions. This can increase the risk of a patient being prescribed high fall risk medications or PIMs with any adverse event. PIMs indicated in the American Geriatrics Society (AGS) Beers Criteria should be avoided by prescribers when caring for older adults due to the increased risk of poor medical outcomes.^{1,4} Drug-drug or drug-disease interactions with these PIMs in older adults have been known to cause an increased risk of falls, fractures, bleeding, decline in renal function, and negative

Abstract

Background: Polypharmacy is defined as the use of five or more medications and is highly prevalent in long-term care facilities (LTCFs). Patients aged 65 or older are at a greater risk of unintended adverse events, such as falls and cognitive impairment, due to polypharmacy.

Objective: Quality improvement project describing the benefits of incorporating a student pharmacist into the deprescribing process and evaluating the need to deprescribe therapies to reduce falls and potentially inappropriate medications (PIMs).

Methods: Student pharmacist assessed patient profiles for high fall risk medications and PIMs. Medications recommended for tapering were level 1 or 2 fall risk and/or PIMs with any adverse event on the American Geriatrics Society (AGS) Beers Criteria. Medications recommended for discontinuation were level 3 fall risk and PIMs with any adverse event on the AGS Beers Criteria.¹

Results: Every patient identified for the project was taking at least one medication that put them at a greater risk of falling, and 10% were taking at least one PIM. High fall risk medications were the most common with a mean use of 6 medications per patient, whereas the use of PIMs had a mean of 3 medications per patient. Total medication use of all patients included was 1,002 medications with 330 targeted for deprescribing due to posing a high fall risk and/or being a PIM with any adverse event.

Conclusion: Pharmacists and student pharmacists have an opportunity to play a more significant role in deprescribing medications. Student pharmacists are a beneficial addition to the medication review and deprescribing process.

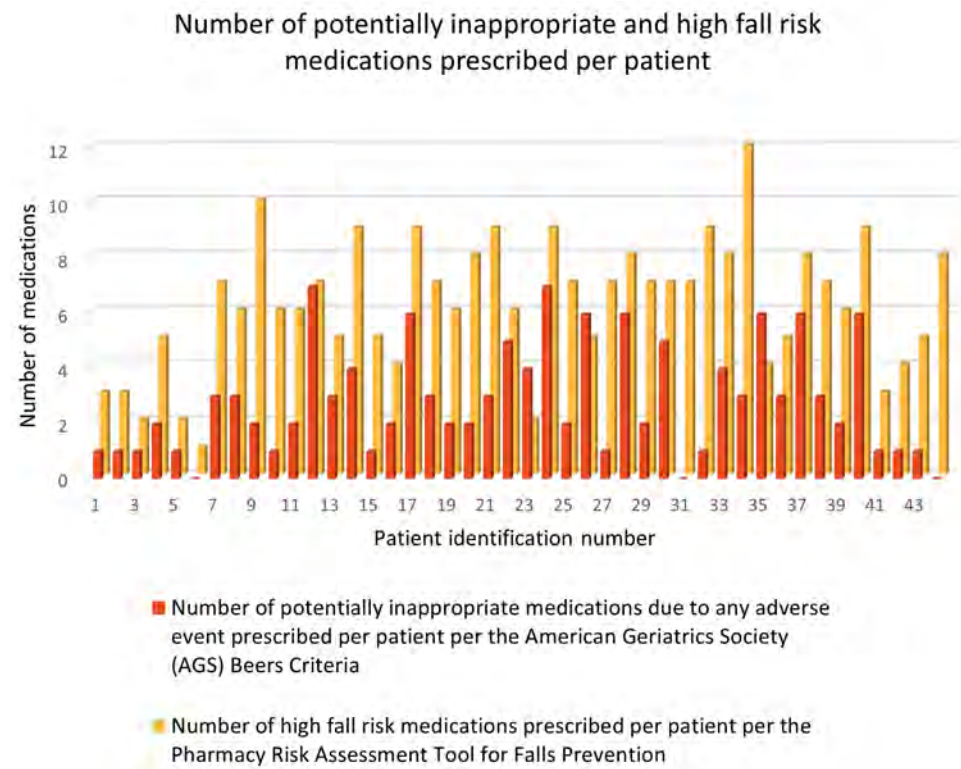
central nervous system (CNS) effects.¹

To prevent adverse events and these interactions, the planned process for tapering or discontinuing these high fall risk medications and PIMs from a patient's medication regimen is known as deprescribing—a method that aims to reduce negative patient-oriented outcomes.^{5,6} Deprescribing requires a multifactorial approach involving clinical knowledge, shared decision-making between the patient and/or caregiver, and communication with the healthcare team.³ Because pharmacists are uniquely positioned and trained to review a patient's medication list and identify potential adverse drug events due to PIMs, they possess the necessary skills to identify and resolve issues related to polypharmacy, especially when caring for older adults.³ When performing patient medication reviews, pharmacists can identify medications without an appropriate indication and help initiate the deprescribing process.⁷

Thus, pharmacists conducting medication reviews play a significant role in the healthcare team as they aim to optimize medication regimens and reduce adverse outcomes. However, modern healthcare challenges such as limited patient visit time and healthcare resources can prevent pharmacists from being able to make the greatest impact possible. To help reduce the burden placed on pharmacists to review patient charts and tackle these challenges, student pharmacists serving as pharmacist extenders can play a significant role.⁴ Integrating trained student pharmacists into the medication review process can lead to an enhanced medication review. Additionally, these opportunities provide an invaluable experience in reviewing medications for the students' future careers, and help develop their critical thinking skills.⁸ Trained student pharmacists serving as pharmacist extenders are well positioned to assess medication appropriateness, identify medication-related problems, and alleviate deprescribing burden from pharmacists.⁷

Finally, most literature that focuses on medication review and deprescribing appears to be an evaluation aimed at clinical pharmacists and not student pharmacists.⁸ Very few studies have gathered the viewpoints of pharmacists outside of the inpatient setting, such as community or long-term care, on deprescribing in

FIGURE 1. Medications Targeted for Intervention



daily practice.⁹ Additionally, few studies exist that have evaluated the student pharmacist's role or gathered the student's perspectives on deprescribing as a member of the healthcare team.⁴ The primary objective of this quality improvement project was to (1) describe the benefit of incorporating a student pharmacist into the deprescribing process. Secondary objectives included having the student pharmacist (2a) perform retrospective chart reviews of newly admitted patients to the LTCF with a (2b) focus on evaluating the need for deprescribing of therapy to reduce falls and PIMs. The UW-Madison Institutional Review Board (IRB) determined that this work did not meet the definition of research and was therefore qualified as quality improvement.

Methods

The quality improvement project was conducted as a retrospective chart review to identify opportunities to deprescribe high fall risk medications and PIMs of selected patients after their admission to the skilled nursing facility (SNF). Additionally, a student pharmacist was trained and incorporated into the deprescribing process.

Project members consisted of one consultant pharmacist/faculty member and one second-year student pharmacist from the UW-Madison School of Pharmacy.

Practice Site Description

Collaboration for this project involved Capitol Lakes Health Center, specifically its SNF, and the SNF's medical director. Capitol Lakes Health Center is in downtown Madison, WI and provides various living options for older adults. Residents may reside in and transition through assisted living, skilled nursing, and memory care facilities. As of November 1, 2022, the SNF made a transition from long-term to short-term care and supports 39 beds on 1-floor, providing rehabilitation care for patients with a wide range of diagnoses, including infections, heart failure, hypertension, diabetes, dementia, and falls.¹⁰ The student pharmacist was provided access to the SNF's electronic health record (EHR) and project documents were stored in the pharmacist and student's shared university provided electronic Box folder. All protected health information was de-identified before transfer to the Box folder.

Participants

Charts of newly admitted patients to the LTCF were screened by the student pharmacist using the EHR to determine eligibility based on inclusion criteria of (1) 65 years of age or older, (2) new admission (less than 1 week) to the SNF, and (3) largest combined number of scheduled and as needed medications of the residents admitted for the week. One to two patients were selected per week for review by the student pharmacist. If a second patient was selected, they were to meet the listed inclusion criteria, except that they would have the second largest combined number of scheduled and as needed medications of the residents admitted for the week. Patients were excluded from the project if they did not meet inclusion criteria.

Study Design

Once the weekly patient(s) was selected, an in-depth review process of their current medication list was conducted by the student pharmacist. The review process was conducted in a sequence of five steps: (1) collect medication-specific information such as drug name, dose, frequency, and drug class; (2) identify high fall risk medications on a scale of 1 (low risk) to 3 (high risk) assigned based on drug class by referencing the 2012 Innovations in Pharmacy Risk Assessment Tool for Falls Prevention; (3) identify PIMs due to any adverse event by referencing the 2019 AGS Beers Criteria; (4) formulate deprescribing recommendations for the selected patient(s) using a pharmacist-developed drug regimen review (DRR) format; (5) submit the DRR to the facility's consultant pharmacist and ultimately the medical director for review.^{1,11}

Recommendations to taper or discontinue medications were made by the student pharmacist based on pre-determined deprescribing criteria. Medications were recommended to be tapered by lowering the dose or using an alternative medication to eventually discontinue its use if the medication met the criteria of being a level 1 or 2 fall risk and/or a PIM with any adverse event on the AGS Beers Criteria. Medications were recommended to be discontinued by using guideline-directed therapy due to the risk of causing potential harm if the medication met the criteria of being a level 3 fall risk and a PIM with any adverse event on the AGS Beers Criteria.^{1,11}

FIGURE 2. Summary of Results



Prior to submission to the SNF's medical director, patient DRRs were submitted to the consultant pharmacist for review. Biweekly meetings were held between the pharmacist and student pharmacist to review recommendations and discuss rationale. The pharmacist would then present the DRR to the medical director for review.

Study Outcomes: Objective 1: Incorporation of a student pharmacist into the deprescribing process

The student pharmacist worked alongside the pharmacist for the entire duration of the project. The student pharmacist was incorporated in the project design, documentation procedure, chart reviews, developing deprescribing recommendations, and discussing rationale with the pharmacist. The student pharmacist was able to incorporate guideline-directed therapy into the process as deprescribing recommendations were developed. Finally, the student pharmacist spearheaded the

analysis and summarization of the data collected via descriptive statistics and presented it to the pharmacist for final review.

Objective 2a: Retrospective review of medication profiles of newly admitted patients to the LTCF

Every Monday during the project duration, the student pharmacist received a list of new admissions for the week prior from the SNF. Upon receiving the list, within one week of patient admission, the student pharmacist would apply the inclusion criteria to determine patient eligibility. Once a patient(s) was selected per the inclusion criteria, an in-depth review of their current medication list occurred to collect information such as drug name, dose, frequency, drug class, fall risk score and yes/no inclusion on the AGS Beers Criteria for applicable medications. Collecting such information allowed the student pharmacist to increase their exposure to common medications, dosages, drug classes, and

indications seen in long-term care patients. De-identified patient information was documented in a running spreadsheet with fall risk medication and PIM drug classes tallied by the student pharmacist.

Objective 2b: Focus on evaluating the need for deprescribing of therapy to reduce falls and PIMs

During the selected patient's medication list review, individual medications were assessed for fall risk based on drug class. By referencing the Pharmacy Risk Assessment Tool for Falls Prevention, the student pharmacist was able to cross-reference medications. Individual medications were rated on a fall risk scale of 1 (low risk) to 3 (high risk) assigned based on drug class and recorded.¹¹ Medication regimens were also assessed for PIMs with any adverse event by referencing the AGS Beers Criteria. Medications that were currently prescribed to the patient and listed on the AGS Beers Criteria were recorded with the corresponding AGS Beers Criteria table number and therapeutic recommendation, if applicable.¹ Through assessing medication therapies, the student pharmacist advanced their skills of interpreting current deprescribing guidelines and thus developing deprescribing recommendations.

Results

The project ran over the course of 48 weeks from May 2022 through April 2023. A total of 293 patients were screened for inclusion in the project and 44 patients met the inclusion criteria. Patients meeting inclusion criteria were prescribed a total of 1,002 medications during the project. Of those medications prescribed, 698 were administered scheduled and the remaining 304 were administered as needed. The overall mean of scheduled and as needed medications per patient meeting inclusion criteria was 23 medications (range 3-38). More specifically, the mean scheduled medications per patient meeting inclusion criteria was 16 (range 2-26) and the mean as needed medications per patient meeting inclusion criteria was 7 (range 1-14).

A total of 398 medications were flagged as high fall risk medications and/or PIMs, per cross reference with the Pharmacy Risk Assessment Tool for Falls Prevention or AGS Beers Criteria, respectively.^{1,11} Two-hundred seventy-three medications were

identified to have a fall risk greater than 1 based on drug class from the Pharmacy Risk Assessment Tool for Falls Prevention and 125 medications were included as PIMs with any adverse event from the AGS Beers Criteria.^{1,11} The most common target for deprescribing was the use of high fall risk medications with a mean of 6 (range 1-12) per patient whereas the use of PIMs had a mean of 3 (range 0-7) per patient (Figure 1). Overall, 330 of the 398 of the total medications flagged as high fall risk medications and/or PIMs, or 33% of total prescribed medications of patients meeting inclusion criteria, were recommended by the student pharmacist to be deprescribed. Specifically, 31 medications were recommended to be discontinued and 299 medications were recommended to be tapered. To summarize, 100% of patients selected for review by meeting inclusion criteria were taking at least one medication that put them at a greater risk of falling per the Pharmacy Risk Assessment Tool for Falls Prevention, while 10% of patients were taking at least one PIM with any adverse event per the 2019 AGS Beers Criteria (Figure 2).^{1,11}

The most common drug classes that were targeted for deprescribing recommendation were as follows with their corresponding number of medications: (1) analgesic, non-opioid (n=86); (2) antihypertensive (n=63); (3) antidepressant (n=34); (4) analgesic, opioid (n=31); (5) antiseizure (n=26); (6) proton-pump inhibitor (n=22); (7) anticoagulant (n=16); (8) nonsteroidal anti-inflammatory drug (n=10); (9) antiemetic (n=5); (10) histamine H2 antagonist (n=5).

Discussion

Significant findings from this quality improvement project confirm that polypharmacy, including inappropriately prescribed medications and increased risk of negative patient-oriented outcomes, occurs within LTCFs. Additionally, the student pharmacist was able to combine project-specific and nationally recognized deprescribing guidelines when evaluating the need for deprescribing a patient's medication(s) based on fall risk. The student pharmacist worked as a pharmacist extender to enhance their drug knowledge through retrospective reviews and was successfully integrated into the healthcare team to provide recommendations.

To enhance the pharmacists' reach, the student pharmacist was successfully trained to review the medication regimen of selected patients and analyze additional chart information, as needed. The EHR was shared with the student using a fully remote platform that allowed the student to see up-to-date patient specific information. The student pharmacist independently developed workflow steps from the time a new patient arrived at the SNF to the point of making a targeted medication recommendation to the pharmacist. Under the supervision of the pharmacist, the student pharmacist was able to develop project specific deprescribing guidelines while incorporating those that are nationally recognized. These guidelines included deprescribing levels of priority and specific start/stop medication recommendations to present to the pharmacist. The student pharmacist was well equipped to assist the SNF's pharmacist in assessing high fall risk medication appropriateness and developing deprescribing recommendations related to reducing the number of falls.⁷

Through mutual decision making between the pharmacist and student pharmacist, it was decided that therapy recommendations would be developed based on evaluating the need to reduce falls. The student pharmacist was trained how to properly evaluate medications based on risk factors presented in the Pharmacy Risk Assessment Tool for Falls Prevention and 2019 AGS Beers Criteria.^{1,11} Specifically referenced by the student, the AGS Beers Criteria contains an explicit list of PIMs that have been known to cause an increased risk of falls and other adverse events in older adults.¹ The student pharmacist identified patient-specific high fall risk medications and/or PIMs, determined the deprescribing need based on pre-determined criteria, and then focused on justifying the recommendation in documentation to the pharmacist. By performing patient medication reviews, the student pharmacist working as a pharmacist extender developed skills to identify high fall risk medications using references and forming written deprescribing recommendations.⁷

Throughout the project's duration, the role that student pharmacists can play when acting as pharmacist extenders and the skills gained by students from exposure to deprescribing in the long-term care setting

were recognized. This project supports the integration of student pharmacists into the medication review process, which led to an increase in successfully completed patient chart and medication reviews under the SNF's pharmacist. This project also served as an invaluable experience in reviewing medications for the student's future career as a practicing pharmacist.⁸ Through independent and guided training, the student pharmacist continually developed a screening and chart review workflow focused on deprescribing high fall risk medications and PIMs. Similarly, once the student pharmacist was able to successfully identify the high fall risk medications and/or PIMs, their focus could shift to developing the skill of how to formally present patient specific information to a fellow healthcare professional. There is the understanding that the skills developed now as a student will translate to the workplace with increased comfort approaching medications eligible to be deprescribed in the future, helping to combat the rates of polypharmacy across all patient populations. Of note, though this project focused on deprescribing high fall risk medications and/or PIMs, student pharmacists can be trained to identify medications eligible for deprescribing due to various other reasons, including as needed medication not being used, medications without indications, drugs causing side effects, etc.

The benefits of incorporating student pharmacists into the deprescribing process go far beyond increasing drug knowledge, learning common indications, confidence in presenting recommendations to a provider, and developing project guidelines. However, several studies have indicated that student pharmacists possess limited exposure to the deprescribing process.⁴ In a study with 91 participants, 59.3% of students reported exposure to the deprescribing process in their didactic coursework. But only those students who reported exposure within their coursework were more likely to agree that their program prepared them to deprescribe in practice.³ This demonstrates the need for pharmacy programs to incorporate the exposure of medication deprescribing into their curriculum.

Over the course of the project, limitations were identified that affected the extent to which the deprescribing initiative could be implemented. First, the project

included patients from only one SNF that cared for patients needing short-term rehabilitation. Throughout the course of the project, the patients admitted to the facility had a broad range in the number of prescription and non-prescription medications. However, the inclusion criteria for the project only selected for patients with the highest total number of prescription and non-prescription medications from that week's group of new admissions.

Second, during the project, the SNF transitioned from a 2-floor to 1-floor facility with a maximum of 39 beds by November 1, 2022. This was due to the facility transitioning from long- to short-term care and changes in the admitted patient population. This change resulted in fewer patients admitted per week by the SNF and thus fewer patients eligible to be screened for inclusion criteria. This reduced the potential of having a patient meet the project's weekly inclusion criteria. Additionally, this change resulted in rapid patient turnover and hindered the project's future potential of measuring the number of deprescribing implementations made by the SNF's healthcare team based on the student pharmacist's recommendations.

Finally, due to the SNF's transition from long- to short-term care and changes in the admitted patient population, the portion of the project that incorporates the student pharmacist will not be continued. The low weekly census made it challenging for the student pharmacist to continue identifying high-quality patients using the project's specific inclusion criteria. Incorporation of the student pharmacist into the project collected sufficient data to show active polypharmacy within the SNF's patient population and many patients taking medications which put them at a higher risk of falling. The project encouraged the SNF's healthcare team to continue the project and grow the facility's deprescribing initiative, as demonstrated by their established ownership of workflow to taper or discontinue medications since the beginning of the project. Additional benefits for patients would come from the healthcare team transitioning the scope of the project to measure outcomes such as the number of successful deprescribing implementations within a designated period.

Conclusion

Despite the facility's transition in care, the data gathered and information analyzed is a valuable addition to the current literature on the significance of polypharmacy within LTCFs. Project findings highlight the heightened risks, such as falling, faced by patients 65 years of age and older when taking multiple prescription and non-prescription medications.

Incorporating a student pharmacist into the medication review and deprescribing process has been a successful implementation. The SNF and pharmacist were able to successfully complete an extensive amount of additional patient chart and medication reviews with the help of the student pharmacist. Likewise, this opportunity has allowed for an extension of classroom learning into real-world application for the student pharmacist while being exposed to deprescribing concepts not widely taught in the Doctor of Pharmacy curriculum. The student pharmacist was able to gain experience in developing workflows, fostering professional relationships, project management, presenting written and oral deprescribing recommendations, and scientific resource utilization.

Jenna Harnish is a 2025 PharmD Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. Mara Kieser is a Faculty Member at the University of Wisconsin-Madison School of Pharmacy and a and Consultant Pharmacist at Capitol Lakes Health Center in Madison, WI.

Corresponding Author:

Mara Kieser - mara.kieser@wisc.edu

PR

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

Acknowledgments: The abstract associated with this original work was presented during the poster session at the 2023 Pharmacy Society of Wisconsin (PSW) Annual Meeting at the La Crosse Center in La Crosse, WI August 24-26, 2023. No sources of funding to declare.

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

Jenna Harnish indicates that she had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

References

1. By the 2019 American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *J Am Geriatr Soc.* 2019;67(4):674-694. doi:10.1111/jgs.15767
2. Varghese D, Ishida C, Haseer Koya H. Polypharmacy. *StatPearls.* 2023
3. Clark CM, Hejna M, Shao E, Maerten-Rivera JL, Monte SV, Wahler RG. Knowledge and attitudes of student pharmacists regarding polypharmacy and deprescribing: a cross-sectional study. *Pharmacy.* 2020;8(4):1-19. doi:10.3390/pharmacy8040220
4. Springer SP, Cernasev A, Barenie RE, Axon DR, Scot D. "I think deprescribing as a whole is a gap!": a qualitative study of student pharmacist perceptions about deprescribing. *Geriatrics.* 2022;7(3):1-10. doi:10.3390/geriatrics7030060
5. Scott IA, Hilmer SN, Reeve E, et al. Reducing inappropriate polypharmacy: the process of deprescribing. *JAMA Internal Med.* 2015;175(5):827-834. doi:10.1001/jamainternmed.2015.0324
6. Thompson W, Farrell B. Deprescribing: what is it and what does the evidence tell us? *Can J Hosp Pharm.* 2013;66(3):201-202. doi:10.4212/cjhp.v66i3.1261
7. Bhardwaj S, Garvin S, Kuehl S, et al. Incorporation of student pharmacists into a proton pump inhibitor deprescribing telehealth program for rural veterans. *Innov Pharm.* 2022;13(3):1-12. doi:10.24926/iip.v13i3.4500
8. Poots AJ, Jubraj B, Ward E, Wycoco A, Barnett N. Education around medication review and deprescribing: a survey of medical and pharmacy students' perspectives. *Therapeutic Advances in Drug Safety.* 2020;11:1-9. doi:10.1177/2042098620909610
9. El-Dahiyat F, Jairoun AA, Al-Hemyari SS, et al. Are pharmacists' knowledge and practice the key to promoting deprescribing of potentially inappropriate medication: a missing link between treatment and outcomes. *Int J Pharm Pract.* 2023;31(4):387-395. doi:10.1093/ijpp/riad027
10. Zheng J, McCourt N, Kieser M. Design and implementation of student pharmacist-driven assessment of heart failure regimen appropriateness in skilled nursing facility residents with heart failure: a quality assurance project. *JPSW.* 2023;26(4):19-23.
11. Rumore MM, Vaidean G. Development of a risk assessment tool for falls prevention in hospital inpatients based on the medication appropriateness index (MAI) and modified Beers Criteria. *Innov Pharm.* 2012;3(1):1-12. doi:10.24926/iip.v3i1.256

The journey begins here.

Did you know?

PTCBB is the only credentialing organization that helps pharmacy technicians build a career path no matter where they are on their journey. Start with CPhT and move forward on PTCBB's Tech Trek with specialty credentials.

UPDATED IN 2023!

Get started with PTCBB's
new practice tools.

Learn more
at ptcbb.org

PTCBB
Pharmacy Technician Certification Board®



UNIVERSITY OF WISCONSIN-MADISON SCHOOL OF
PHARMACY STUDENT WRITING CLUB:

Understanding and Addressing Medical Misinformation and Disinformation: The Pharmacist's Role

by Nora P. Pecha, 2025 PharmD Candidate, Doha Awad, 2025 PharmD Candidate, Nicholas F. Apitz, 2024 PharmD Candidate, Alayna N. Kellam, 2025 PharmD Candidate, Nuelle D. Agcaoili, 2024 PharmD Candidate, Cassie S. Sedgwick, PharmD



Given the ease of access to online information, it is common for patients to seek diagnoses, treatments, and medical advice through the internet. This practice is not inherently destructive, as it can help patients be more involved in their healthcare and can promote conversations with healthcare professionals; however, issues arise because mis/disinformation are widespread and can be difficult to distinguish from high-quality information.¹ Quality information may be thought of as that which is endorsed by healthcare professionals and reliable evidence. Current practices in the United States healthcare system revolve around evidence-based medicine, where health recommendations are supported by randomized trials, case studies, meta-analyses, and expert opinions. In contrast to reliable health information, misinformation refers to the presentation of health-related opinions as facts, despite lack of evidence and agreement from the scientific community. It may take the form of misleading hyperbole drawn from emerging research; anecdotal evidence without statistical or empirical significance; and/or false information and conspiracy theories that perpetuate distrust. This includes information that was initially thought to be true but was later corrected or withdrawn.² Sometimes, accurate data

Abstract

Given the ease of access to online information, it is common for patients to seek diagnoses, treatments, and medical advice through the internet. However, this practice may jeopardize the pharmacist-patient relationship due to the rise of the spread of healthcare-related mis- and disinformation. Here, we investigate the propagation of, who is most vulnerable to, and what approaches pharmacists can take to address health-related mis/disinformation.

may be misinterpreted to form a false narrative; for instance, a national analysis of COVID-19 inpatient mortality in 2020 found that there was a mortality rate of 13.2% in hospitalized COVID-19 patients, and that proportion increased to 55.9% for COVID-19 patients who had been put on a ventilator.³ This statistic could be mistakenly interpreted as ventilators being the cause of increased patient mortality, though the higher mortality rate is actually due to the fact that patients with more severe, life-threatening infections are more likely to require mechanical ventilation. The spreading of misinformation is unintentional, as even the deliverer of the misinformation believes it to be true. In contrast, disinformation is the purposeful spreading of information that is known to be false to support a personal claim and/or deliberately mislead the public.³

There are a variety of reasons that people spread unjustified health claims, and they are largely the same reasons that a person might be susceptible to accepting these health claims as truth. Some individuals might have an underlying distrust of the United States healthcare system, due to its history of mistreatment of minority groups; others, which might include celebrities or politicians, might spread unfounded health claims for personal or political gain.⁴ The spread of mis/disinformation has been amplified by social media outlets such as YouTube, Twitter, and TikTok, especially following the COVID-19 pandemic that began in March 2020. As public health information and recommendations were politicized and changed frequently, many Americans grew hesitant to trust professional health organizations such as the Centers for Disease Control (CDC)

and the World Health Organization (WHO).⁴ Demographic, socio-economic, and psychological vulnerabilities influence how likely an individual is to believe and spread unjustified claims.⁵ Therefore, it is important that each strategy for correcting mis/disinformation accounts for the extent and nature of such information rather than blaming an individual who might be vulnerable. Furthermore, healthcare professionals should recognize vulnerabilities among their patients, as well as themselves, and approach conversations with empathy, open-mindedness, and reliable information to facilitate constructive dialogue and a recognition of patient perspectives.

Social media, personal beliefs, and/or propagation of false health information can have a real-world effect on health risks. One survey evaluated the relationship between the amount of COVID-19-related conspiracy theories one believed and one's risk of contracting COVID-19. In this study, Hughes et. al. found a positive correlation between conspiracy theory belief and having lower compliance to pandemic regulations, increasing the risk for contracting COVID-19.⁶ Furthermore, people who are susceptible to such conspiracy theories might have a greater need for intervention by healthcare providers and pharmacists. Numerous articles have focused on the identification of misinformation, but there are still gaps in the research about how to most effectively correct health misconceptions. Pharmacists are the most easily accessible healthcare providers and therefore have an opportunity to improve health literacy among the public. Even so, efforts made by public health ambassadors such as pharmacists may be compromised if they lack the techniques and strategies to effectively combat mis/disinformation.² Pharmacists and student pharmacists should understand mis/disinformation, as well as be able to address it at individual and systemic levels through dialogue with patients, novel routes of communication, and improved access to reliable information.

Spreading of Misinformation and Disinformation

Exploring Dissemination Mechanisms

Before proposing how healthcare professionals such as pharmacists can

combat the mis/disinformation crisis, we must examine how it has become such a large issue, and, more specifically, the methodologies that are used to spread it. The transmission of inaccurate information depends on various factors, including personal belief systems, education background, and previous experiences with the healthcare system.⁷ A 2021 study conducted in China with around 22,700 participants further examined these external factors and found positive relationships between the acceptance of misinformation and increased health-related anxiety, predisposed beliefs favoring misinformation, and exposure to the same misinformation. In addition, certain demographic differences, including age, socioeconomic class, and level of education, were negatively associated with misinformed acceptance. For example, people of a lower socioeconomic status showed greater acceptance of misinformation. The United States' population shares similar susceptibility with China, with varying economic classes, education standards, and diverse belief systems. A study was done to investigate how virtual forums utilize other methods of content-phrasing to propagate inaccurate medical information. Examples identified were: 1) misleading content application or creating false context, 2) satire, 3) fabrication of information, 4) impersonation of reputable sources, 5) distorting genuine information, or 6) explicitly deceiving readers through mismatching article titles and content.⁴ These methods for distributing disinformation impact patients' ability to make safe, autonomous decisions regarding their health and can make it even more difficult for patients to sift through valid or invalid information online.

The concept of misinformation or disinformation stemming from information initially believed to be true but later corrected is key to understanding another method for perpetuating incorrect medical information: the continued influence effect (CIE). CIE explains how a memory containing inaccurate information continues to have influence over a person's reasoning.² This can generally be explained by a person's need for developing their own mental map of events, resulting in an inability to recall information from the correct source; or recalling false information more frequently, and therefore making it more familiar and

believable. Considering the long-term impact CIE has on population reasoning, particularly when making decisions about health, it is important to recognize its significance and consider how each unsubstantiated statement, video, article, or other media can alter patients' perspectives.

Finally, it is important to consider the role of infodemics in the spread of misinformation and discouraging patients from seeking reliable health information. Infodemics are events where "too much information [is published] including false or misleading information in digital and physical environments during a disease outbreak" or health emergency.⁸ As seen during the COVID-19 pandemic, updates on disease spread and pathology changed on a nearly daily basis, with publications from a multitude of sources with varying credibility. Being able to distinguish between accurate and false information was difficult, even for very health-literate readers. To further investigate the impacts of infodemics, Nascimento et.al. conducted a systematic review that showed infodemics negatively impacted patients' willingness to follow health recommendations on medical treatments or during public health emergencies, which was amplified by misinformation on media platforms.⁹

Propagators of Information

Misinformation seems ubiquitous today—so where is it coming from? Many articles investigating this question concluded that social media platforms such as YouTube or TikTok and public discourse from celebrities or political figures were the primary sources of misinformation.¹⁰⁻¹³ Research on misinformation has showed social media platforms having a greater role in the spread of misinformation due to its rapid updates and wide availability to various populations. One example of misinformation propagation in social media can be found in a YouTube media frenzy over the self-administration of Fenbendazole and its effects on cancer. Research by Yoon et. al. showed that it wasn't a singular YouTube post that led to the movement in Fenbendazole use, but rather the consistent video uploads by multiple people advocating for its efficacy.¹⁰ Moreover, as the number of social media posts about inaccurate medical knowledge increases, the greater an influence the

falsified information has on patients using these forums. In addition, this study showed how YouTube's video recommendation system was unlikely to connect viewers with accurate medical information if they had already engaged with material promoting self-administration. This was an example of social media platforms' pre-programmed recommendations that can lead users to more content containing health fallacies.

Another example of social media's impact on spreading poor-quality information can be seen in its ability to generate "echo chambers." Echo chambers are illusory spaces where individuals seek information that reinforces their own polarized views.¹⁴ Within these internet environments, there is a strong separation between contradicting medical recommendations, leading patients down a path of affirming what they already believe versus learning new, scientifically sound treatment options.

The use of social media has become a daily habit for a vast majority of the global population and poses both benefits and risks to the spread of health information. It creates an environment for falsified beliefs to thrive through spreading disinformation and allowing mass publication of misinformation, leading to an accumulation of unfounded sources that are difficult to separate from founded ones.¹⁵ As healthcare professionals, it is important for us to keep in mind the methods used to propagate information and the reasons why mis/disinformation is accepted in order to properly address it.

Impact on Pharmacy Practice

Primary pharmacist responsibilities in any healthcare setting include managing disease states and medication therapy, monitoring outcomes, administering vaccinations, and patient education on all these services. However, the delivery of pharmacist services can be severely impacted by the spread of inaccurate information. Despite pharmacist education on the importance of adherence, patients may not comply with the prescribed regimen due to unfounded fears; may self-medicate; or may seek alternative, harmful, non-evidence-based therapy. Patients may also hinder the monitoring of outcomes by misinterpreting symptoms and side effects, making it more challenging for pharmacists to assess critical factors in medication safety and

efficacy. Furthermore, as the spread of mis/disinformation erodes trust between patients and healthcare professionals, pharmacist-patient relationships may become strained. Public health initiatives such as vaccination campaigns may also face significant resistance.

Vulnerable Populations

Mis/disinformation is inherently compelling, and innate vulnerabilities leave us all at risk of being misled. Misinformation is more than simple ignorance; it is driven by social and psychological factors. Awareness of underlying vulnerabilities can help pharmacists and other healthcare workers recognize their own gaps in understanding, and approach misinformed patients with empathy.

As previously noted, the infodemic phenomenon complicates public reaction in times of emergency, and it increases public anxiety.⁸ Anxious patients turn to the internet in search of information to ease their worries, but when confronted with information that intensifies their anxiety—factual or not—they dig even deeper. This experience is called "Cyberchondria."¹⁶ Most people, regardless of their health literacy level, tend to use poor-quality sources and unreliable websites when seeking health information online.^{14,17} In fact, people generally engage more with articles of low scientific quality compared to those of higher quality, as the former are often easier to find and access. Thus, reliable articles compete with clickbait designed to prompt engagement and an emotional response from readers.¹¹

As people sift through online information, confirmation bias drives them towards information that confirms their prior beliefs and knowledge, and repeated exposure makes that information more salient in the readers' minds. As previously described, increased acceptance of misinformation has been found among those with health-related anxiety, beliefs aligned with misinformation, and repeated exposure to the same misinformation.⁷ Nevertheless, people tend to assume that others are more heavily influenced by media and misinformation than they are themselves, a phenomenon known as the "third-person effect."¹⁸ Individuals are likely to underestimate their own level of

misperception and exaggerate the extent to which others are misinformed.

While several psychological phenomena render all people vulnerable to mis/disinformation, certain populations may be more vulnerable for other reasons. Seo et al. identify low-income, African American older adults as a particularly vulnerable group, while Basch et al. suggest that young people may be increasingly susceptible to inaccuracies; however, these groups are sensitive for different underlying reasons.^{12,20} On one hand, young people are significantly more reliant on social media for news and health information, making them a target.¹⁵ A 2022 survey conducted by the Pew Research Center found that 50% of adults younger than 30 "have some or a lot of trust in the information they get from social media sites."²¹ On the other hand, the intersection of age, racial disparities, and financial hardship contributes to the limited internet access and lower rates of digital literacy among low-income, African American older adults. More generally, Seo et al. note that older age and lower socio-economic status are each associated with lower rates of internet use and access, irrespective of race.²⁰ With limited access to reliable sources of information and/or fact-checking resources online, low-income adults, particularly older adults, are less equipped to assess information credibility. Additionally, many African Americans, Indigenous communities, and other marginalized groups have experienced abuses and trauma within medical and governmental systems and thus may be less trusting of the medical establishment and government entities as reliable sources of information.⁴

Mis/disinformation exploits the inherent psychological vulnerabilities of confirmation bias, the third-person effect, and health anxiety to produce false beliefs about health information. Poor internet literacy may also contribute to individuals' vulnerabilities, given that many people rely on low-quality websites and engage minimally with quality scientific information online. Over-reliance on social media for health and news information can leave young people particularly vulnerable to mis/disinformation on these platforms, but lack of access to the internet among low-income, elderly, and marginalized populations makes it difficult to reach

these groups to address and combat false information. To successfully address mis/disinformation among patients, pharmacists should approach patients with knowledge of the psychological phenomena that make them inherently persuasive as well as an empathetic understanding of the social factors influencing access to and comprehension of reliable scientific information. As a trusted professional, a pharmacist is uniquely situated to work with patients to come to an accurate understanding of their health literacy

Pharmacist Relevance in Addressing Misinformation and Disinformation

According to the American Society of Health-System Pharmacists, pharmacists have an obligation to “participate in global, national, state, regional, and institutional efforts to promote public health.”²² Pharmacies have already begun efforts to improve public health in various ways, including tobacco cessation programs, appropriate opioid use counseling, and administering vaccinations. These services can be highlighted or adjusted based on the needs of the community; for example, as the use of e-cigarettes grows among adolescents, pharmacies can begin tailoring tobacco cessation programs towards overall nicotine cessation. Because the spread of mis/disinformation grows on the internet, it is only natural that pharmacists begin addressing this problem to promote public health.

Given the factors that can make an individual vulnerable to believing mis/disinformation, pharmacists might ask how to best intervene and correct false conceptions. A study conducted by McGinnes and Ward found that trustworthiness of a source trumped the expertise of the source in the ability to persuade in an argument.²³ This means that even though a professional might be an expert on a topic, an element of trust is crucial for changing someone's mind. In general, the public trusts healthcare providers more than non-medical scientists to provide accurate health information, with pharmacists being among the top three most trusted healthcare professionals.¹¹ Coupled with their abundance and accessibility, pharmacists are in a unique

position to intervene in the spread of mis/disinformation.

While pharmacists are equipped with clinical knowledge, patient counseling skills, accessibility, and public trust to combat misinformation, there are still barriers to be considered. Hermansyah et. al. asked 41 pharmacists about health misinformation and identified four factors that influence the willingness of a pharmacist to correct misinformation. The factors were: pharmacist motivation, patient-pharmacist relationship, opportunities to respond, and ability to respond.¹³ Pharmacist motivation refers to why the pharmacist chooses to correct some pieces of misinformation but not others, which can become a barrier when discussing sensitive topics that may give rise to conflict. The patient-pharmacist relationship is a crucial factor because, as mentioned, trustworthiness is often more important than expertise in individuals' minds. The opportunity and ability to respond to mis/disinformation are additional obstacles, with time being the largest barrier.

Systemic Solutions

Some evidence indicates that interventions from official governmental bodies, such as the CDC, are effective in correcting health misconceptions. This aligns with real-world examples in other countries such as Japan, where one tweet from Tokyo City Hall significantly reduced the rumor that there would be chemical rain after an earthquake.¹⁴ When presented with clear, evidence-based corrections, patients can reduce their belief in misinformation.²⁴ Given how powerful the effects of an organizational effort can be, healthcare institutions have a responsibility to disseminate precise and trustworthy health information via transparent communication networks. Additionally, they should train healthcare professionals to leverage resources for bolstering public trust.

Some of the barriers to communicating health information are a lack of communication training and a lack of standardization of health literacy among healthcare staff. Currently, there is a fraught relationship between health experts and the media, with many health experts believing the media reports inaccurate information and many in the media believing health experts lack communication skills.¹⁴ One

solution is to have health professionals build a positive relationship with media outlets, and having journalists help train healthcare workers in making their message more palatable to a wider audience, while health professionals help journalists with discerning accurate sources of information. In addition, a good relationship between the media and health experts creates a situation where the public's attention is called toward a public health crisis. An example of this is the 1980s AIDS crisis where, with the help of the media, accurate information about the source and transmission of AIDS was disseminated nationwide and allowed for a dramatic decrease in the spread of HIV. By the end of the 1980s, nearly all adults were aware of precautionary steps to avoid infection.²⁵ Not only did this collaboration result in millions of lives saved at the time, but it also continues to help keep people safe to this day.

Another solution is to improve the health literacy of pharmacy staff, as literacy can vary across organizations and jobs. The issue of uniformity can be addressed by having continuing education seminars for staff that address questions about medications and conditions observed in the patient population in a more patient-friendly manner. This could also be integrated into existing staff training. This will help pharmacists, pharmacy technicians, and student pharmacists translate medical jargon into patient-friendly terms to help compensate for patients' varying degrees of health literacy. In doing so, these professionals will not only increase quality of care by helping their patients achieve knowledge required for autonomous decisions, but also protect them from mis/disinformation. Additionally, educating patients makes it easier for them to distinguish between reliable and unreliable information on their own.

To better communicate information, part of the challenge is to know the information inside and out. A team of researchers in Germany proposed a general framework for how to design and implement a training program for institutions.²⁶ These training programs will serve to improve and standardize the health literacy among staff in an institution. This framework can be modified depending on the needs of each health system. These programs are divided into three phases:

development, implementation, and evaluation. In the development phase, leadership should gather 6 to 8 people from each department to represent their group and interview these representatives with a focus on barriers or facilitators of health literacy. Collaboration with these departments to develop participatory workshops to increase health literacy will provide workers with the opportunity to practice such skills and retain them. In the implementation phase, trainers should slowly integrate these workshops and adjust them based on feedback.²⁶ The pace needed for this may vary among organizations. For the evaluation phase, longitudinal surveys for patients and staff should be used to evaluate the effectiveness of these workshops. Using this data, efforts can be made to improve workshops in future applications.

Another issue in communicating health information to the public is the waning trust between healthcare organizations and patients. While trust in organizations is steadily decreasing, trust in healthcare workers remains strong due to more personal individual interactions.¹⁴ Many videos and posts about health on social media are personal, anecdotal stories or questionably sourced think pieces. An increase in evidence-based online content by health experts would be beneficial for the public.²⁷ Organizations can give these professionals a platform, such as YouTube or a blog, to share their expertise. An organization could provide a platform for pharmacists to answer patient questions or create educational videos on medications, which can reach a wider audience. In addition to communication training, additional social media training could be given. This could include standardized guidelines on content and how to peer-review information. Similar to the framework for training, these guidelines will depend on the values of the organization. By giving these professionals a platform, they will be able to educate more patients and protect them from the consequences of mis/disinformation.

With the collective efforts of an organization, it will be easier to combat the spread of mis/disinformation on a larger scale due to their access to resources and available workforce. A staff of healthcare workers trained in translating health

topics for mass consumption will not only help improve health outcomes to allow patients to make informed decisions but also increase organizational trust by demonstrating organization-wide competence. Furthermore, making patients more receptive to correction and giving healthcare workers a platform to reach more people could help minimize the effects of mis/disinformation.

Individual Solutions

Addressing health mis/disinformation will require the coordinated efforts of health organizations, media organizations, technology platforms, and educators. However, there is an urgent need for the efforts and expertise of individual healthcare professionals to address the issue through their day-to-day interactions with patients. Pharmacists have a unique position to proactively engage with patients and influence their exposure to and acceptance of evidence-based medical information. Guidance provided by the U.S. Surgeon General's advisory on building a health information environment advises that clinicians begin by taking the time to learn the patient's knowledge and values with empathy and understanding, then "correct their misinformation in personalized ways."²⁸ The following are some helpful recommendations for pharmacists to assist in addressing mis/disinformation in practice, via online platforms, and through engagement with other healthcare professionals.

Understanding why misinformation and disinformation are appealing and using that lens to guide motivational interviewing with patients.

An important element of the appeal of mis/disinformation is that it often originates from truth that is distorted to fill a complicated information gap. Therefore, the motivational interviewing style of communication should guide patients in critically analyzing medical information presented to them while honoring their autonomy. Motivational interviewing is a communication method that emphasizes empathy and collaboration between the healthcare professional and patient. It focuses on analyzing components of the patient's perspective and tailoring the response to the patient's specific needs in

navigating medical information. This tool is powerful in addressing mis/disinformation as it fosters a supportive environment that rebuilds the diminishing trust created by propagators of such information.²⁹ To effectively establish rapport with patients, pharmacists should not dismiss inaccuracies as a whole, but break down the presented claim and extract the correct idea from which it originated. This will guide patients in understanding the flawed reasoning that leads to mis/disinformation and appeals to patients' health-related anxiety and pre-existing beliefs through negative emotional argument.^{30,1} Patients are likely to accept this incorrect information as true to alleviate their worries and feel a greater sense of autonomy surrounding their health. It is a pharmacist's professional responsibility to use this understanding to reassure patients and provide advice that accounts for patients' concerns, lived experiences, and diverse needs. Finally, patients tend to adopt mis/disinformation that promises a rapid cure or warns of immense health dangers because such promises are portrayed as imminent, while the effects of complying with evidence-based medicine appear insufficient and irrelevant in comparison. It is important to highlight to patients the difference between nuanced yet credible information based on scientific consensus, and bold statements designed with clever marketing by non-credible sources.

Providing a framework for patients to recognize misinformation and disinformation to improve health literacy.³⁰

In addition to addressing mis/disinformation during consultations with patients, pharmacists can provide them with guidance for evaluating the accuracy of health information. Patients should be advised to begin by critically considering the source. They should evaluate whether the creator or author has expertise in the topic through their education, work experience, or credentials and if they provide scientific sources to support their claims. Furthermore, patients should be warned against substituting information provided by "expert patients" for professional advice, as it often presents personal, negative perceptions that induce mistrust in healthcare institutions.¹

After a source is examined, patients

should be advised to consider whether the medical information is relying on scientific data from a single research article or analyzing a comprehensive body of evidence. Patients should be alerted to the use of one medical journal article in online content as evidence since there is a hierarchy to the quality of research articles and scientific consensus is based on a compilation of peer-reviewed work, not just one. Additionally, they should consider how corrections in science are made based on emerging evidence with statistical significance and incorporated into medical protocols to improve the quality of care provided to patients.

Finally, the content of health information can be evaluated by considering whether it is contradictory to what is advised by scientific experts and medical organizations. Patients should be informed to avoid online content that promotes a medical treatment, diet, or cure that is presented as a simple solution to a complex health problem. Accurate medical information does not contain “miracle solutions” or “alarmist” language; rather, it informs of both the benefits and potential risks of the proposed treatment.³¹ They should also critically question information that relies on evoking emotional responses, understanding that it is likely fear-based marketing. Lastly, if flaws are found pertaining to the source of information, evidence, or logic, patients should seek alternative verification to the presented information. In summary, pharmacists can advise patients to evaluate the following elements to determine information’s credibility: source, author credentials, whether it stands alone or with scientific consensus, and whether it is consistent with current expert advice.

After utilizing the aforementioned strategies, if patients express distrust of scientific experts and medical organizations, pharmacists should still encourage critical thinking and source evaluation, understanding that trust is built over time.

Providing patients with medically accurate alternative online sources and using social media platforms.

Many individuals use low-quality websites for health information regardless of their health literacy.¹ Pharmacists can reduce patients’ exposure to online mis-

information by providing patients with links to approved online alternatives. Alternative sources should contain terminology that is friendly for a fifth grade reading level, which is the average Medicare patient reading level;³² utilize engaging materials; and be easy to share with members of their community. Another method to reduce patients’ need for online medical advice is to become a reference through online social media networks. Misinformation is more prevalent on social media than accurate information, with narratives that focus on fear and mistrust in academic and medical institutions in regards to topics such as vaccines, alternative treatments, and medication safety.¹⁵ Pharmacists can dismantle inappropriate health news and disseminate accurate information on social media to promote health literacy and combat the infodemic.³³ The internet can also be used as a collaborative tool with other healthcare professionals to create reliable content for patients.

Conclusion

The unprecedented spread of mis/disinformation has been impacting the health of individuals and communities, sowing distrust in healthcare institutions and professionals, and hindering public health efforts. It is critical for pharmacists to be ready to engage in systemic and individual solutions to assist patients in navigating this environment. Pharmacists hold a unique position as accessible healthcare professionals to address mis/disinformation with patients with methods that account for their diverse concerns and experiences.³⁴ This grassroots approach, combined with involvement in organizational efforts, can be a powerful force in curbing mis/disinformation and promoting patient resilience against it.

Nora Pecha is a 2025 PharmD Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. Doha Awad is a 2025 PharmD Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. Nicholas Apitz is a 2024 PharmD Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. Alayna Kellam is a 2025 PharmD Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. Nuelle Agcaoili

is a 2024 PharmD Candidate at the University of Wisconsin-Madison School of Pharmacy in Madison, WI. Cassie Sedgwick is a Clinical Pharmacist at the William S. Middleton Memorial Veteran’s Hospital in Madison, WI.

Corresponding Author:

Nora Pecha - npecha@wisc.edu

PR

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

Acknowledgments: Thank you to Dr. Cassie Segwick for her continued guidance throughout the research and writing process. The authors would also like to thank the UW-Madison Writing Center for their feedback and instruction in the making of this article.

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

References

1. González-Pérez Y. Disinformation in the information age. *Eur J Hosp Pharm.* 2020;27(6):319-321. doi:10.1136/ejpharm-2020-002213
2. Cacciatore MA. Misinformation and public opinion of science and health: approaches, findings, and future directions. *Proc Natl Acad Sci U S A.* 2021;118(15):e1912437117. doi:10.1073/pnas.1912437117
3. Isath A, Malik A, Goel A, Gupta R, Shrivastav R, Bandyopadhyay D. (2023). Nationwide analysis of the outcomes and mortality of hospitalized COVID-19 patients. *Curr Probl Cardiol.* 2022;48(2):101440. doi:10.1016/j.cpcardiol.2022.101440
4. Mhonde RD, Riddick B, Hingle A, et al. “I just don’t know what to believe”: sensemaking during the Covid-19 pandemic among criminal legal involved communities. *Int J Environ Res Public Health.* 2022;19(22):15045. doi:10.3390/ijerph192215045
5. Keselman A, Arnott Smith C, Leroy G, Kaufman DR. Factors influencing willingness to share health misinformation videos on the internet: web-based survey. *J Med Internet Res.* 2021;23(12):e30323. doi:10.2196/30323
6. Hughes JP, Efstratiou A, Komer SR, Baxter LA, Vasiljevic M, Leite AC. The impact of risk perceptions and belief in conspiracy theories on COVID-19 pandemic-related behaviours. *PLoS One.* 2022;17(2):e0263716. doi:10.1371/journal.pone.0263716
7. Pan W, Liu D, Fang J. An examination of factors contributing to the acceptance of online health misinformation. *Frontiers in Psychology.* 2021;12:1-11. doi:10.3389/fpsyg.2021.630268
8. World Health Organization. Infodemic. https://www.who.int/health-topics/infodemic#tab=tab_1. Accessed May 15, 2023.
9. Borges do Nascimento IJ, Beatriz Pizarro A, Almeida J, et al. Infodemics and health misinformation: a systematic review of reviews. *Bull World Health Organ.*

- 2022;100(9):544-561. doi:10.2471/blt.21.287654
10. Yoon HY, You KH, Kwon JH, et al. Understanding the social mechanism of cancer misinformation spread on YouTube and lessons learned: infodemiological study. *J Med Internet Res*. 2022;24(11):339571. doi:10.2196/39571
11. Loeb S, Sengupta S, Butaney M, et al. Dissemination of misinformative and biased information about prostate cancer on YouTube. *Eur Urol*. 2019;75(4):564-567. doi:10.1016/j.eururo.2018.10.056
12. Basch CH, Meleo-Erwin Z, Fera J, Jaime C, Basch CE. A global pandemic in the time of viral memes: COVID-19 vaccine misinformation and disinformation on TikTok. *Hum Vaccin Immunother*. 2021;17(8):2373-2377. doi:10.1080/21645515.2021.1894896
13. Hermansyah A, Sukorini AI, Rahayu TP, Suwito KA. Exploring pharmacist experience and acceptance for debunking health misinformation in the social media. *Pharmacy Education*. 2021;21(2):42-47. doi:10.46542/pe.2021.212.4247
14. Swire-Thompson B, Lazer D. Public health and online misinformation: challenges and recommendations. *Annu Rev Public Health*. 2020;41(1):433-451. doi:10.1146/annurev-publhealth-040119-094127
15. Wang Y, McKee M, Torbica A, Stuckler D. Systematic literature review on the spread of health-related misinformation on social media. *Soc Sci Med*. 2019;240:1-12. doi:10.1016/j.socscimed.2019.112552
16. McMullan RD, Berle D, Arnáez S, Starcevic V. The relationships between health anxiety, online health information seeking, and cyberchondria: systematic review and meta-analysis. *J Affect Disord*. 2019;245:270-278. doi:10.1016/j.jad.2018.11.037
17. Quinn S, Bond R, Nugent C. Quantifying health literacy and eHealth literacy using existing instruments and browser-based software for tracking online health information seeking behavior. *Comput Hum Behav*. 2017;69:256-267. doi:10.1016/j.chb.2016.12.032
18. West JD, Bergstrom CT. Misinformation in and about science. *Proc Natl Acad Sci U S A*. 2021;118(15):e1912444117. doi:10.1073/pnas.1912444117
19. Corbu N, Oprea D-A, Negrea-Busioc E, Radu L. "They can't fool me, but they can fool the others!" third person effect and fake news detection. *Eur J Commun*. 2020;35(2):165-180. doi:10.1177/0267323120903686
20. Seo H, Blomberg M, Altschwager D, Vu HT. Vulnerable populations and misinformation: a mixed-methods approach to underserved older adults' online information assessment. *New Media & Society*. 2021;23(7):2012-2033. doi:10.1177/1461444820925041
21. Liedke J, Gottfried J. U.S. adults under 30 now trust information from social media almost as much as from national news outlets. <https://pewrsr.ch/3DF4dn1>. Published October 27, 2022. Accessed January 3, 2024.
22. Cameron G, Chandra RN, Ivey MF, et al. ASHP statement on the pharmacist's role in public health. *Am J Health Syst Pharm*. 2022;79(5):388-399. doi:10.1093/ajhp/zxab338
23. McGinnies E, Ward D. Better liked than right: trustworthiness and expertise as factors in credibility. *Pers Soc Psychol Bull*. 1980;6(3):467-472. doi:10.1177/014616728063023
24. Goobie GC, Guler SA, Johannson KA, Fisher JH, Ryerson CJ. YouTube videos as a source of misinformation on idiopathic pulmonary fibrosis. *Ann Am Thorac Soc*. 2019;16(5):572-579. doi:10.1513/AnnalsATS.201809-644OC
25. Committee on Assuring the Health of the Public in the 21st Century. The future of the public's health in the 21st century. *NLM*. 2002:307-357. doi:10.17226/10548
26. Lubasch JS, Voigt-Barbarowicz M, Lippke S, et al. Improving professional health literacy in hospitals: study protocol of a participatory codesign and implementation study. *BMJ Open*. 2021;11(8):e045835. doi:10.1136/bmjopen-2020-045835
27. Sanborn MD. Population health management and the pharmacist's role. *Am J Health Syst Pharm*. 2017;74(18):1400-1401. doi:10.2146/ajhp170157
28. Roozenbeek J, Schneider CR, Dryhurst S, et al. Confronting health misinformation. *R Soc Open Sci*. 2020;7(10):1-22. doi:10.1098/rsos.201199
29. Rollnick S, Butler C, Kinnersley P, Gregory J, Mash B. Motivational interviewing. *BMJ*. 2010;340:c1900. doi:10.1136/bmj.c1900
30. Fridman I, Johnson S, Elston L. Health information and misinformation: a framework to guide research and practice. *JMIR Med Edu*. 2023;9:e38687. doi:10.2196/38687
31. UCSF Health. Evaluating health information. <https://www.ucsfhealth.org/education/evaluating-health-information>. Accessed May 8, 2023.
32. Stossel L, Segar N, Gliatto P, Fallar R, Karani R. Readability of patient education materials available at the point of care. *J Gen Intern Med*. 2012;27(9):1165-1170. doi:10.1007/s11606-012-2046-0
33. Erku D, Belachew S, Abriha S, et al. When fear and misinformation go viral: pharmacists' role in deterring medication misinformation during the "infodemic" surrounding COVID-19. *RSAP*. 2021;17(1):1954-1963. doi:10.1016/j.sapharm.2020.04.032
34. Marwitz KK. The pharmacist's active role in combating COVID-19 medication misinformation. *J Am Pharm Assoc*. 2020;61(2):71-74. doi:10.1016/j.japh.2020.10.022

Wisconsin Pharmacy Law Review

www.pswi/Advocacy/Pharmacy-Law-Review



Pharmacy Society
of Wisconsin



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

The Importance of Building Upon Critical Thinking in the Setting of Patient Care

by Bailey M. Hutchings, BSPS, 2025 PharmD Candidate

Critical thinking is an important skill for pharmacists and all members of the patient care team. To understand how vital critical thinking is, we need a comprehensive definition that applies to pharmacists and pharmacy students. One review defines critical thinking as “a purposeful and self-regulatory judgment which results in interpretation, analysis, evaluation and inference.”¹ Many other definitions exist, but most include key words like “interpretation,” “analysis,” “evaluation,” and “inference.” We highlight this particular definition because it applies to the daily activities of a pharmacist and a student during experiential education.

The four key components of critical thinking are interpretation, analysis, evaluation, and inference. Without pharmacists using these skills throughout their day, errors would negatively impact patients. An example of critical thinking in pharmacy is determining what medications a patient should receive, even if all online resources do not show a contraindication. In one instance, a pharmacist had received a new prescription for dextroamphetamine and amphetamine (Adderall®) extended-release to be taken at bedtime, along with the patient’s previous zolpidem (Ambien®) and morning dextroamphetamine and amphetamine (Adderall®) extended-release prescription. No online clinical resources showed a clinical contraindication between an extended-release stimulant taken twice a day and a sedative hypnotic taken at bedtime. The provider who sent the new prescription was adamant that the prescription be filled, and there were no documented contraindications to prevent this prescription from being filled. The

Abstract

Critical thinking skills are vital in creating a safe and effective healthcare environment. Currently, there are very few studies that show how critical thinking is utilized in the patient care setting or the academic setting. The research that has been conducted shows a lack of examining critical thinking at the depth that it needs to be, especially in the medical field. Despite this, there are known benefits to critical thinking in healthcare, including improving profits, increasing the mental capabilities of employees, and bringing innovative ideas to a work environment. Some ways to teach critical thinking include having students debate, having students evaluate problems that do not have one definitive answer, and allowing students to be creative in their education. The best next steps include conducting studies on the amount of critical thinking pharmacists use and giving students the opportunity to foster and grow their critical thinking skills throughout experiential education.

pharmacist, while using critical thinking to evaluate potential harm to the patient, determined that adding on an extended-release stimulant later in the day was not beneficial to the patient. The patient already had trouble sleeping at night, and adding on another stimulant later in the day would not help the patient’s sleeping issues. Without this use of critical thinking, there likely would have been a downward spiral in the patient’s conditions. The act of critical thinking facilitated safe and effective healthcare. How is it possible to determine the importance of critical thinking skills and build upon the ones pharmacists are taught?

Didactic Education

The first step for evaluating critical-thinking education is to determine the backbone of a core curriculum that is being taught to pharmacy students. It is important to assess whether pharmacy students’ classes will propel them to be



critical thinkers with every patient they interact with. The Accreditation Council for Pharmacy Education (ACPE) sets accreditation standards for all pharmacy schools. In its most recent accreditation standards from 2016, the organization lists the necessary classes needed and the student accomplishment standards for which schools must provide evidence.² Critical thinking is only mentioned once in these standards, under standard three. The standards include, “outcome data from assessments of student achievement of problem-solving and critical thinking capabilities.” ACPE also outlines specific classes that are necessary for a pharmacy school to become accredited. Most of the classes and requirements listed are built on basic pharmaceutical knowledge and knowledge of the healthcare system. There are very few classes focused on social and behavioral sciences, and no requirements on how to teach critical thinking to student pharmacists.

Experiential Education

In addition to didactic learning, ACPE also focuses on experiential education, or introductory and advanced pharmacy practice experiences (APPEs). ACPE states, “APPE ensures that students have multiple opportunities to perform patient centered care and other activities in a variety of settings.”² ACPE also states, “APPE hones the practice skills, professional judgment, behaviors, attitudes and values, confidence, and sense of personal and professional responsibility required for each student to practice independently and collaboratively in an interprofessional, team-based care environment.” With experiential education (vs. in the classroom), there is a higher focus on building patient-centered skills, which can include critical thinking. One benefit to having an experiential curriculum is that students are often placed in uncomfortable situations and forced to think on their feet. Pharmacy students are forced to start using clinical judgment while also building relationships with other important members of the healthcare team. These aspects are what truly help foster critical thinking skills. Unfortunately, APPEs only occur in the last year of pharmacy school. There are opportunities to build critical thinking skills during introductory pharmacy practice experiences (IPPEs) throughout the first two years of school, but IPPEs are relatively

short in duration. Students may not have enough time through IPPEs, or they may not have enough clinical knowledge to build their critical thinking skills throughout this period, since it typically occurs earlier in the curriculum.

Literature Review

Few studies have evaluated critical thinking in the healthcare setting regarding patient care (Table 1). One systematic review conducted by Brudvig and colleagues in 2013 sought to determine whether critical thinking skills in healthcare professionals changed after they participated in a professional healthcare program.³ This review concluded that there were mixed results regarding whether healthcare workers could improve critical thinking after completing professional programs, based on the small number of studies that were conducted. The authors also mentioned that there are a limited number of high-quality studies in medical fields where patient care is the top priority. Critical thinking is an essential skill, and it is not currently being studied with an appropriate depth. Not being able to examine critical thinking as a skill gives us a lack of information about how often pharmacists use it to deliver competent patient care. Without examination, it is hard to know how well pharmacists are interpreting, analyzing,

evaluating, and inferring.

Another meta-analysis conducted by Reale and colleagues was able to show more development in how students in health professions were able to improve critical thinking skills.⁴ According to the authors, critical thinking is part of foundational thinking, which starts with creating habits of mind. Habits of mind are traits that can be developed and used by critical and self-regulatory thinkers.⁵ The goal of habits of mind is to help students learn on their own at any point in their life. Traits that fall into habits of mind include being open-minded, seeking clarity, restraining impulsivity, and being aware of one’s own thinking. After creating foundational thinking, you are able to build upon more clinical skills, such as problem-solving, clinical reasoning, moral reasoning, and meta-cognition.⁴ With critical thinking, you are able to build upon clinical reasoning while also using moral reasoning. This combination of creating positive habits of mind and using higher-order thinking leads to a more intense focus on patient care. The authors concluded that while some educational programs seem to somewhat improve critical thinking, many of the successful applicants are already very good critical thinkers.⁴ Without daily use and continuous building upon critical thinking skills, pharmacists may lose them. This meta-analysis determined that to

TABLE 1. Summary of Literature Evaluating Critical Thinking in Health Professions

<i>Study Conducted</i>	<i>Type of Study</i>	<i>Population</i>	<i>Intervention</i>	<i>Outcome</i>
Brudvig³	Systematic Review	Nursing, physical therapy, occupational therapy, pharmacy, and medicine	California Critical Thinking Skills Test (CCTST) and Watson-Glaser Critical Thinking Appraisal (WGCTA)	Measurements of acquisition of critical thinking skills are scarce
Reale⁴	Meta-analysis	79 studies containing 6884 students	CCTST, Defining Issues Test (DIT), Health Science Reasoning Test (HSRT)	The CCTST and DIT demonstrated significant increases in total scores, but the HSRT did not show improvement
Persky⁶	Systematic Review	Pharmacy students	Types of interventions to help develop critical thinking skills	Developing skills requires a 4-step approach. The first step is learning the skills of critical thinking. The second step is developing a tendency to create a pattern of effortful thinking. The third step is directing the learner to activities to increase application and transfer of skills. The final step is making the critical thinking process visible by instructors.
Walker⁸	Literature Review	MEDLINE and Educational Resources Information Center (ERIC) search from 1933 to 2002 for any literature related to critical thinking.	Exercises to promote critical thought	Thought develops with consistent practice and evaluation over time using multiple strategies, and faculty should be aware of course goals and learning objectives to promote higher order thinking.

help good critical thinkers become great critical thinkers, each school would need to increase financial and human resources. Increasing those already-finite resources is not a possibility for most schools. Instead, this meta-analysis focused on creating admissions tests that would sort out critical thinking abilities. The authors concluded that educational resources may be prioritized better in helping learners improve problem solving and moral reasoning, and vetting only candidates that have a high tendency to critically think.

One last study conducted by Persky and colleagues demonstrated the impact of barriers and sought to provide evidence-based recommendations to encourage the use and development of critical thinking, specifically in pharmacy students.⁶ This study determined that critical thinking skills are not fixed; they can always be developed and grown. Persky and colleagues determined that critical thinking skills can be developed by attitude alignment, absorption of knowledge, learning new thinking skills, and learning to combat roadblocks such as bias. One of the key ways to grow critical thinking skills is to have a growth mindset, which is a difficult concept to teach.

Implications for Practice

Before determining the next steps for pharmacists and pharmacy students, the benefits of critical thinking need to be outlined. The Department of Education produced a text in 2014 to show all benefits of critical thinking, specifically in the workplace.⁷ Using critical thinking skills helps to limit biases that are potentiated by close-minded thinking. Critical thinking encourages every employee to weigh all viable options in a certain situation and pick the best one. Critical thinking can also improve profits in a workplace and increase the mental capabilities of employees. It causes employees to improve culture between themselves and their upper management. Another benefit of critical thinking is that it often brings innovative ideas and processes to a work environment. Critical thinking is also a vital skill during the current age of artificial intelligence. It will help healthcare workers, especially pharmacists, stand out and in their healthcare settings. In summary, increasing critical thinking in the workplace

can improve workflow and increase deeper thinking about issues and current workplace culture.

The next crucial step is to incorporate critical thinking into APPEs and IPPEs for all pharmacy students. A study by Walker in 2003 outlined ways to teach critical thinking.⁸ One important method is to introduce students to various ways of teaching, and help students understand that there may be more than one answer to each problem. Another way to increase critical thinking is to incorporate higher-level thinking questions that use key words like “explain,” “compare,” or “why.” These questions cause students to think at a higher level and build upon critical thinking skills. While asking these questions, it is important to give students adequate time to promote thinking. Discussion and debate are also important, because they help students to examine other reasoning processes. Ethical issues are one of the best ways to promote critical thinking, because it is understood that there is no “correct” answer, and each student needs to have reasoning behind each answer. This causes thought and understanding to flourish, which is the best way to increase critical thinking. Creativity is another segue into critical thinking. When a student is allowed to write creatively, they can open their mind to other ideas and promote their own critical thinking. All these options can also be utilized by experiential preceptors in the patient care setting.

Conclusion

Although there are many steps to take to improve critical thinking, it can be accomplished. The first step is to conduct more studies on the use of critical thinking skills and the benefits to patients, including normal usage by pharmacists in daily practice. Student pharmacists should be given more opportunities to problem solve, debate, and evaluate issues, especially with their preceptors while on experiential rotation.

Bailey Hutchings is a 2025 Doctor of Pharmacy Candidate at Concordia University Wisconsin School of Pharmacy in Mequon, WI.

Corresponding Author:

Bailey Hutchings - Bailey.hutchings@cuw.edu

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

Acknowledgements: I would like to thank Dr. Sarah Ray and Dr. Sarah Peppard for their review, guidance, and feedback on this article. Their time and attention to this article are greatly appreciated.

Disclosure: The author declares 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.

References

1. Adib-Hajbaghery M, Sharifi N. Effect of simulation training on the development of nurses and nursing students' critical thinking: A systematic literature review. *Nurse Education Today*. 2017;50:17-24. doi:10.1016/j.nedt.2016.12.011
2. Accreditation Council for Pharmacy Education. Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. Published online 2015. Accessed December 4, 2023. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf
3. Brudvig TJ, Dirkes A, Dutta P, Rane K. Critical thinking skills in health care professional students: a systematic review. *Journal of Physical Therapy Education*. 2013;27(3):12.
4. Reale MC, Riche DM, Witt BA, Baker WL, Peeters MJ. Development of critical thinking in health professions education: A meta-analysis of longitudinal studies. *Curr Pharm Teach Learn*. 2018;10(7):826-833. doi:10.1016/j.cptl.2018.04.019
5. Marzano RJ, Pickering D, McTighe J. Assessing student outcomes: performance assessment using the dimensions of learning model. Association for Supervision and Curriculum Development. 1993.
6. Persky AM, Medina MS, Castleberry AN. Developing critical thinking skills in pharmacy students. *Am J Pharm Educ*. 2019;83(2):7033. doi:10.5688/ajpe7033
7. Murawski LM. Critical thinking in the classroom...and beyond. *J Learn High Educ*. 2014;10(1):25.
8. Walker SE. Active learning strategies to promote critical thinking. *J Athl Train*. 2003;38(3):263-267.

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

Business Member Spotlight: Rhineland Hometown Pharmacy

by Harley Anderson, 2025 PharmD Candidate



David Schiek comes from a long line of medical professionals serving the Rhineland, Wisconsin community. After attending pharmacy school at Ferris State University in Big Rapids, Michigan, Schiek returned to his hometown of Rhineland in 1996 to serve as a pharmacist at Stoxen Pharmacy. He practiced for nearly 25 years in various independent and chain pharmacies before purchasing and merging two local independent pharmacies, including Stoxen Pharmacy, into what we now know as Rhineland Hometown Pharmacy in 2018.

Day to Day Practice

Rhineland Hometown Pharmacy is an independent pharmacy nestled right in downtown Rhineland. In addition to their wide variety of pharmacy and patient care services, they have a stylish front end that sells home décor and specialty gifts. Their array of unique services includes comprehensive medication reviews (CMR), blood pressure monitoring, and durable medical equipment rentals. Some patients even stop in one or more times a week for Schiek to check their blood pressure and send it to their primary care provider's office. He describes the working environment at Rhineland Hometown Pharmacy as "fast and furious." With only one pharmacist on staff day-to-day and an average daily script volume of over 200, things can get hectic quickly. With patients needing consultations, receiving vaccines, and asking questions, Schiek has become a master of multitasking and prioritizing.

Schiek has extensive connections to the Rhineland community. His father, grandfather, and great-grandfather were all surgeons in the Rhineland area. With a population of around 8,000, Rhineland is a close-knit community where everyone

knows and supports one another. "I was born and raised here ... I'm a fourth-generation healthcare provider in the area... so [my ties to the community] do run deep," Schiek says. Word of mouth within the town has played a significant role in growing Rhineland Hometown Pharmacy's patient base. Schiek's connections to the Rhineland healthcare world have led physicians and nurses to recommend his pharmacy to their patients.

Schiek believes that advocating for the advancement of pharmacy practice is of great importance. He has taken on a leadership role on the PSW Board of Directors as the Region C Director. They recently had their first meeting of the year, where directors spent time getting to know one another and setting priorities for the year ahead. He's excited for what's to come, saying, "We'll go over topics that we feel are of interest and then see how we want to present them to the PSW group as a whole ... We'll also discuss certain legislation that is coming about that we want to take a stance on." He's looking forward to being a part of the advocacy that PSW has been so successful with.

Raising the Bar

Schiek prides himself on the advanced practice model of his pharmacy. In 2021, he partnered with PSW and the Wisconsin Pharmacy Quality Collaborative (WPQC) program to assess the impact of providing CMR services to patients. For 6 months, he met with 16 patients bimonthly to look for issues with their medication management and find solutions for them. A specific issue that Schiek wanted to address was patients not filling their medications on time. "I wanted to find out why; if it was economic, if it was a delivery issue, if it was [being] forgetful, whatever their reasons were," Schiek said. After meeting with the patient, they would work together to set goals

and follow up on those goals at their next appointment. In terms of impact, Schiek says, "Those patients did better [with] knowing why it's important to take their medications." For this project, Schiek was honored with the WPQC Innovation award from PSW in 2022.

Schiek believes that the kind demeanor and positive attitude displayed by his staff has been a big part of making his practice successful. He says, "I put a lot of strain and stress on myself, but I have a really excellent staff, and they are probably the biggest reason for any success I've had. ... That's what I've found most valuable here." Lorana Klunder, a patient of Rhineland Hometown Pharmacy, feels that "personal touch" is an essential part of pharmacy that is being lost in our world. She raves about the care that Schiek and his team provide to patients, saying, "Dave and his staff are very knowledgeable and helpful with any problems that I have. I would not go anywhere else. I love my pharmacy!" With the motto, "Our family caring for your family," it's clear that Rhineland Hometown Pharmacy cares a great deal about building a personal connection with the patients they serve. Carol Shattuck, a Rhineland Hometown Pharmacy technician, knows that patients are the top priority in their pharmacy. Shattuck says, "Our patients come first! We strive to do the best for our patients by listening to their needs and concerns. Then we exceed their expectations!"

Bumps in the Road

Insurance companies have been a thorn in the side of small independent pharmacies. Pharmacy benefit managers (PBM) have made it nearly impossible for these pharmacies to be successful. "Right now, [direct and indirect remuneration] fees are growing year after year. We have to come up with other revenue sources to

offset that,” Schiek says. He’s hopeful that the passing of provider status would offer a solution in terms of billing and revenue, but they will still be searching for solutions until that day comes. When the insurance companies incentivize patients to use their specific contracted pharmacies, independent pharmacies end up taking a big hit, unable to compete with the pharmacy chains that operate under corporate structures. “[Insurance companies] not giving the patient options has been a big blow to us,” says Schiek. We have these services and we’re trying to get the patients healthy, and they’re taking our patients away from us ... I don’t think not having an option serves healthcare well.”

Another issue that Schiek has been dealing with is inadequate patient reception of the services that he implements. It’s difficult for him to help patients understand his services and why they’re important with the limited time that both he and his patients have. Schiek always tries to consider his patient population when predicting whether or not a new patient care service will be successful or a waste of time. In terms of implementing CMRs with patients, Schiek says, “It’s new to them. They’re used to talking more with their doctors or prescribers about it than with their pharmacist ... To actually sit down and dig into some of those problems...and try to

make them rethink their health has been difficult.”

Moving Forward

Schiek has high hopes for new programs and services that he would like to offer his patients. Specifically, he would like to implement more proactive and preventative healthcare initiatives. One service that Schiek is particularly interested in is Cognivue™ cognitive screening. This screening system would allow patients to get a baseline cognitive reading that they can then compare to future readings in order to detect early signs of cognitive decline such as Alzheimer’s or dementia. “I think that’s going to be important for people to get a baseline and then do it once a year to see where they’re at. When we find that they’re slipping or something’s going wrong, we can either treat it over the counter with vitamins and supplements or communicate with the provider to get a prescription,” Schiek says. As a believer in disease prevention rather than treatment, he wants to be able to help patients before they show signs of being sick, no matter the disease state they are dealing with. He says, “We don’t want them getting sick and then coming to us. I’d rather have them come to us first...As weird as it sounds, I want to try to get them off of their medications.”

Schiek is optimistic about the passing of pharmacist provider status in Wisconsin and is excited about what it would mean for his business. Schiek feels that the pushback he’s seeing regarding this major change is the fear of pharmacists “stepping on toes” of physicians. He says, “I think the biggest barrier is that prescribers and other healthcare professionals are feeling like we’re trying to take over their domain.” He believes that it’s important for pharmacists to show the high value that they can add to the provider team. One way to do this is by first working together with physicians and getting them into pharmacies. “Once they’re associated with us, then I can do some of their health services without having to worry about having provider status first,” Schiek says. He feels that this would be a good way to ease everyone into the change and show prescribers how pharmacist provider status can be beneficial.

Schiek offers advice for aspiring pharmacists and those looking to implement practice advancement initiatives at their

sites. The best and easiest thing to do is to ask questions. Utilize the knowledge of mentors, other pharmacies, or PSW to learn about different ways to expand patient care services. “Sometimes when I’m transferring a prescription from pharmacy to pharmacy, I’ll ask the pharmacist some questions about [their practice]. I want to see what’s working for them,” Schiek says. Even if you aren’t practicing in an independent pharmacy setting, Schiek still recommends reaching out to leadership teams if you have a new patient care idea. “Find out what you like to do. Don’t get complacent with counting and counseling. If you have an interest in something ... ask if you can try it out. Initiate things on your own As long as you’re knowledgeable about what you want to do and how you’re going to do it, I don’t see any reason why people shouldn’t let you try.”

Harley Anderson is a 2025 Doctor of Pharmacy Candidate at Concordia University Wisconsin School of Pharmacy in Mequon, WI.

Corresponding Author:

Harley Anderson - Harley.anderson@cuw.edu

Below: Rhinelander Hometown Pharmacy staff.





2024 PSW Legislative Day Recap



2024 PSW Legislative Day Recap

by Danielle M. Womack, MPH, HIVPCP

PSW's 2024 Legislative Day brought together more than 300 pharmacists, pharmacy technicians, and students from across Wisconsin to advocate for the future of pharmacy.

The morning opened with an address by PSW President Hannel Tibagwa Ambord, who warmly welcomed attendees and thanked members for their advocacy for the profession and their continued support of PSW. This year, PSW is highlighting the importance of storytelling. Tibagwa Ambord spoke about how everyone's story is unique and that telling one's own story is critical to influencing the future of pharmacy. Throughout the morning, attendees were encouraged to reflect on their own experiences in pharmacy in preparation for discussions with legislators.

Tibagwa Ambord then presented the PSW Student Good Government Award to those who have shown significant advocacy for the profession. This year, the honor was awarded to three students: Sierra Szymanski (UW-Madison), Hannah Weidner (Concordia University), and Zoe Green (Medical College of Wisconsin). The PSW Good Government Awards was then presented to Dave Hager, a Senior Director at Visante, for his role as an educator to state and federal policymakers on the topic of pharmacist professional judgment. Lastly, the Legislator of the Year award was presented to State Senator Mary

Felzkowski for her tireless efforts at passing comprehensive pharmacy benefit manager (PBM) reform. While Senator Felzkowski's PBM bill was not passed during this legislative session, she committed to reintroducing the bill in the upcoming legislative session during her award remarks.

The morning continued with Danielle Womack, PSW Vice President of Public Policy and Advocacy, and State Representative Clint Moses, Chairman of the Assembly Committee on Health, discussing a variety of issues in healthcare policy, including drug costs, support for medical marijuana, healthcare workforce issues, and Department of Safety and Professional Services (DPS) licensing delays. Representative Moses offered insights into policy-making, debunked common misconceptions, and emphasized that, despite appearances, there is more bipartisan support for healthcare-related issues than is often recognized. The session concluded with valuable advice: to remain engaged with legislators of all political backgrounds, as these interactions will ultimately shape the future of pharmacy.

Following the legislator discussion, Susan Kleppin gave an update on the Pharmacy Examining Board (PEB) activities regarding recent rule projects, including technician registration and remote dispensing, changes to the top 100 drugs list, and third-party logistics providers. PEB resources on applications and licensure

dates were shared, and pharmacists were encouraged to stay current by registering for email updates on the DPS website.

The day concluded with an update from Womack and PSW Contract Lobbyist Forbes McIntosh regarding several bills circulating in the legislature to prepare for discussion at legislator office visits. The first bill would allow pharmacists to independently prescribe contraception. The second bill is a comprehensive PBM reform package, focusing on patient choice in pharmacy. The third bill involves eliminating the Multistate Pharmacy Jurisprudence Examination (MPJE) for pharmacy graduates to help address issues in licensing delays. Following this overview, attendees walked to the Wisconsin State Capitol to discuss these bills with legislators.

Legislative Day 2024 was another successful opportunity to highlight the importance of PSW member advocacy. As pharmacy practice advances, PSW encourages you to continue sharing your story to advocate for the profession. PSW offers several opportunities to get involved at www.pswi.org/Get-Involved.

Danielle Womack is the Vice President of Public Policy & Advocacy at the Pharmacy Society of Wisconsin in Madison, WI.



2024 PSW LEGISLATIVE DAY
Wednesday, February 21, 2024
Monona Terrace Convention Center, Madison



Above: PSW Student Good Government Award Recipients (left to right) Sierra Szymanski (UW-Madison), Hannah Weidner (Concordia University), and Zoe Green (Medical College of Wisconsin)



Pharmacy Society
of Wisconsin

2024 PSW Legislative Day Awards

Below: PSW Good Government Award Recipient Dave Hager from Visante. PSW Legislator of the Year Recipient, State Senator, Mary Felzkowski.



PSW ADVOCACY CONTRIBUTIONS

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



Friends of Pharmacy Fund

Building Influence. Cultivating Relationships.

Money goes into individual accounts associated with giver

Funds dispersed at recommendation of PSW and direction of giver

Used to contribute to campaign events



Money goes into pooled account

Funds dispersed at direction of PSW

Used to contribute to campaign events



LEGISLATIVE DEFENSE FUND

Money goes into pooled account

Funds used for non-campaign advocacy work

Supports PSW Legislative Day, lobbyist retainer fees, and advocacy materials.

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





Not covered?

Not on my shift.

Think your employer will cover you in the event of an error or patient lawsuit?

Unfortunately, your employer's coverage likely has gaps that could leave you stuck paying expensive insurance claims and legal fees out of your own pocket. Luckily, Pharmacists Mutual has your back.

Professional liability insurance coverage for whatever tomorrow brings.

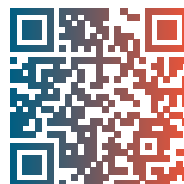
-  **Who we cover.** Over 110 years of experience protecting all pharmacists: retail, compounding, hospital, student, volunteer, self-employed, and more
-  **What we cover.** Immunizations and other drug administration, research, medication consultation, Good Samaritan acts, defendant expense benefits, and various legal defenses



Professional | Commercial | Personal | Life | Disability

See policy for full description of coverages. Personal, life, and disability insurance are written through PMC Advantage Insurance Services, Inc., a wholly-owned subsidiary of Pharmacists Mutual Insurance Company.

For a free proposal: 800.247.5930



phmic.com/pharmacists