



2023–2024 Year in Review

Geisinger Enterprise Pharmacy

Geisinger

Contact Geisinger Enterprise Pharmacy:
570-271-6192

geisinger.org/pharmacy

Contents

Mission and vision	4
Message from the chief pharmacy officer	6
Pharmacy leadership	7
Enterprise Pharmacy pillars	9
Ambulatory care	11
Acute care	29
Formulary & procurement.....	33
Hematology & oncology	37
CPIO	44
Geisinger Health Plan.....	47
Knowledge management.....	51
Operations & compliance.....	59
Strategy and innovation.....	63
Board certified pharmacists.....	71
Awards and recognitions	77
Publications, presentations and posters.....	79
About Geisinger	93





Mission

- To work collaboratively with healthcare professionals across Geisinger and the community it serves to provide safe, cost-effective, evidence-based pharmaceutical care, striving to enhance the lives and health of our patients, system and region
-

Vision

- To lead a paradigm shift toward affordable, proactive, evidence-based pharmaceutical care
- To integrate advanced technologies and pharmacy into direct patient care
- To emphasize a move from a reactive treatment care delivery model to a proactive preventive model
- To leverage cutting-edge technologies like artificial intelligence, Carepaths, pharmacogenomics and digital health solutions that help realize personalized care while limiting unwarranted variation in its delivery



Message from the chief pharmacy officer

Welcome to the 2024–2025 edition of the Geisinger Enterprise Pharmacy annual report.

Our mission: To work collaboratively with healthcare professionals across Geisinger and the community it serves to provide safe, cost-effective, evidence-based pharmaceutical care, striving to enhance the lives and health of our patients, system and region.

Our vision: To lead a paradigm shift toward affordable, proactive, evidence-based pharmaceutical care, integrating advanced technologies and pharmacy (e.g., clinical pharmacists, pharmacy distribution channels) into direct patient care to optimize patient health outcomes locally, regionally and globally. Emphasizing a move from a reactive treatment care delivery model to a proactive preventive model, standardizing care where possible by leveraging cutting-edge technologies like AI, CarePaths, pharmacogenomics and digital health solutions that help realize personalized pharmaceutical care while limiting unwarranted variation in the delivery of that care.

As we reflect on the past year, it is with a sense of pride and accomplishment that I share the highlights and progress of Enterprise Pharmacy. This year has been marked by significant achievements and challenges that have shaped our path forward.

Our commitment to providing exceptional patient care in our hospitals, in our ambulatory practices and at home continue to flourish. I will highlight several accomplishments but there is much more detail in the entire report. We have been through many changes: Epic Willow Inventory and Ambulatory conversion, mail-order HVS production expansion, PBM change, home infusion expansion, new specialty pharmacy, new retail pharmacies, expansion of Centralized Clinical Pharmacy Services and URAC/ACHC accreditation, which have not only enhanced patient outcomes but also improved our operational efficiency. Our team's dedication to adopting cutting-edge practices and technologies has been instrumental in these advancements.

In addition to our achievements, we have faced and addressed several challenges. We continue to see increased costs and utilization of pharmaceuticals along with decrease in reimbursement. Our team has responded with continued diligence of clinical best practice prescribing in our operating rooms and during inpatient stays in treating diseases such as diabetes, hypertension, rheumatoid arthritis, multiple sclerosis and hepatitis C. These experiences have reinforced our resilience and our ability to adapt to an ever-evolving healthcare landscape.

I would like to extend my gratitude to our dedicated Enterprise Pharmacy team and all of our partners for their hard work and unwavering commitment. It is through their efforts that we continue to advance our mission and make a meaningful impact on patient care.



Thank you for your continued support and partnership. Together, we look forward to achieving new milestones and driving further success in the coming year.

Michael A. Evans, RPh, MBA, FASHP
Chief Pharmacy Officer
Geisinger

Pharmacy leadership



Mike Evans
Chief Pharmacy Officer



Kelly Guza
Associate Vice President
Acute Programs



Seth Gazes
Associate Vice President
Planning, Strategy and Analysis



Gerard Greskovic
Associate Vice President
Ambulatory Programs



Dave Klinger
System Director
Operations and Compliance



Eric Wright
Professor and System Director
Center for Pharmacy Innovation
and Outcomes



Daniel Longyhore
System Director
Knowledge Management



Jamie Miller
Associate Vice President
Managed Care Pharmacy



Durga Zally
System Director
Infusion and Oncology Services

Enterprise Pharmacy pillars



Acute Programs

- Medication optimization
- Multidisciplinary team rounds
- Emergency bedside response
- Antimicrobial stewardship
- Anticoagulation management
- Pharmacokinetics
- Medication reconciliation
- Specialty services (e.g., hem/onc, peds)
- IV infusion
- OR



Planning, Strategy & Analysis

- Innovation
- Project management
- CarePaths
- Population health
- EP program analysis and evaluation
- Automation/ technology
- Data informatics



Operations & Compliance

- Medication safety
- Corporate compliance
- Policies and procedures
- 340B



Ambulatory Programs

- Specialty care
- Primary care chronic disease management
- Pharmacy call center
- Retail
- Mail-order
- Specialty
- Home infusion
- Pharmaceutical patient assistance
- Geisinger at Home
- Pharmacogenomics
- Senior-focused care



Contracting & Procurement

- IDN contracting
- IDN procurement
- IDN formulary



Knowledge Management

- Pharmacy residencies
- Student coordination
- Staff training programs
- Competency development
- Patient education materials/ programs
- Collaborative practice



Managed Care

- Drug benefit management
- Formulary management and prior authorization review
- Medical drug benefit management
- Specialty drug management
- Medication adherence & medication therapy management
- Retrospective drug utilization reviews
- Treat-to-target HEDIS metrics
- PBM oversight
- Managed care pharmacy analytics & regulatory reporting



Center for Pharmacy Innovation & Outcomes

- Investigational drug services
- Pharmacy research support
- Pharmacy outcome studies
- Demonstrating effectiveness of pharmacy programs
- Research grants
- Translating research into practice

Pharmacy Care Coordination & Enterprise EHR

Not a building; not a pharmacy: A complete system clinical pharmacy resource responsible for Medication Therapy Disease Management systemwide. We are matrixed throughout the system as a distributed pharmacy and pharmacist network and maintain the patient at the center of all we do.

Ambulatory care



340B qualification and manufacturer restrictions

Over the last 4 years, most notably in the last 18 months, 37 manufacturers (and counting) have imposed 340B purchasing restrictions for contract pharmacies, like Geisinger Specialty Pharmacy. The Geisinger team has been able to collaboratively and strategically navigate such restrictions by expanding their specialty dispensing practices within covered entity-owned pharmacies, expanding the MTDM clinical co-management program and adhering to 340B ESP™ data submission requirements.

The MTDM clinical co-management program, which is a critical driver for both Geisinger’s prescription capture and 340B optimization efforts, was able to optimize their workflow and quickly scale their clinical footprint in specialty departments such as rheumatology, pulmonary medicine, cardiology, neurology, gastroenterology and dermatology. These operational adjustments and expansion resulted in approximately 1,100 340B qualifying visits completed from January through June 2024.

Biosimilar conversions

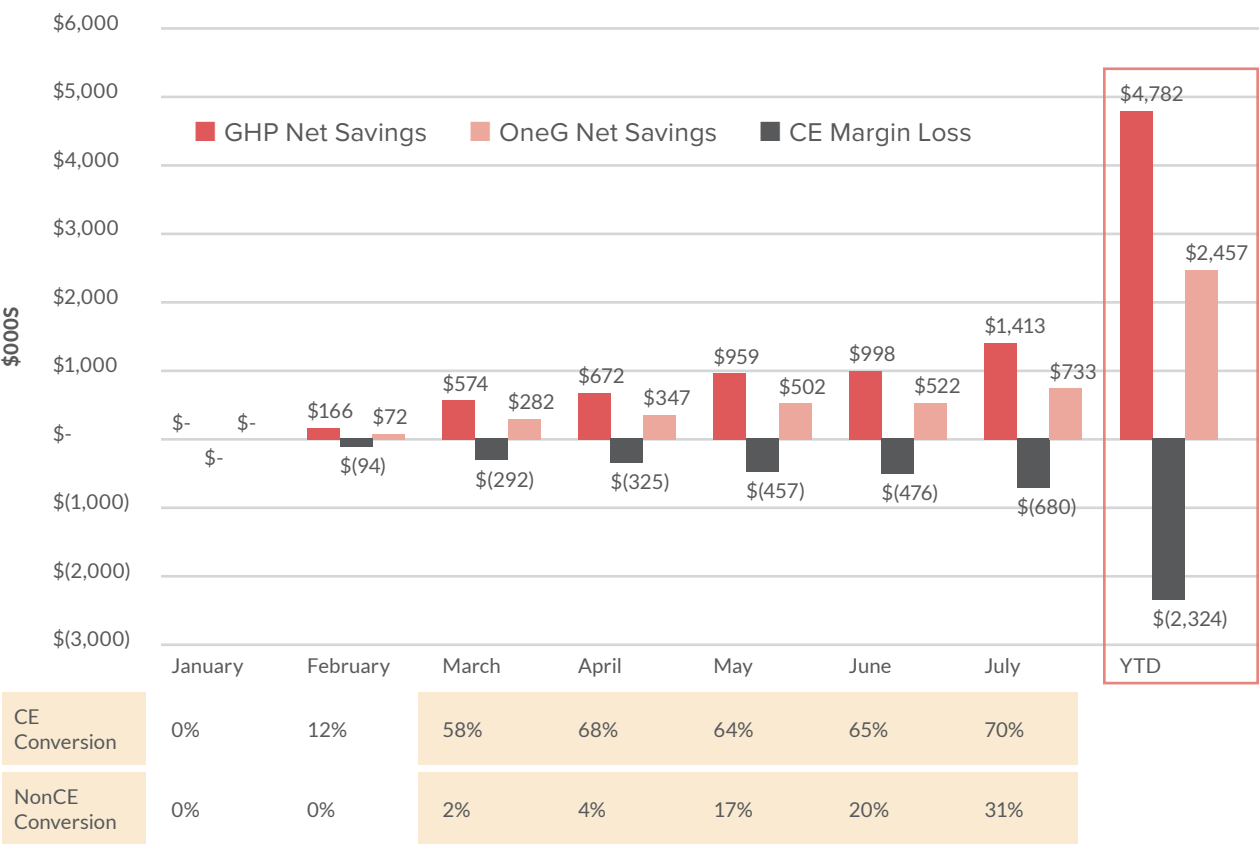
In 2023, we saw the end of market exclusivity for Humira® and the launch of 10 FDA-approved biosimilars. This major change to a widely used, high-cost medication presented both an opportunity and a challenge for the Geisinger pharmacy team.

To support efforts around Humira biosimilar, a CarePath workgroup was created with responsibility for project planning, implementation and value reporting. The process began with an extensive analysis to determine the organizational savings opportunity, preferred biosimilar product selection and prescription conversion strategy.

The pharmacy team collaborated with Medicine Institute leadership to engage key provider stakeholders and develop an operational model which would allow for seamless patient and provider experience. As part of the workflow, pharmacists from Medication Therapy Disease Management and Geisinger Specialty Pharmacy teams were responsible for directly engaging patients, providing clinical education and counseling on biosimilar products, as well as facilitating prescription conversion on behalf of providers.

Through July 2024, 70% of targeted Geisinger-prescribed Humira and 31% of externally prescribed Humira have been converted to a biosimilar product, yielding an estimated \$2.5 million in net organizational savings.

Humira Biosimilar Conversion



CE: Clinical enterprise NonCE: Non-clinical enterprise

Bringing specialty pharmacy together

The patient’s journey of starting a specialty medication at Geisinger often starts with enrollment into the Medication Therapy Disease Management (MTDM) Program. Embedded pharmacists in specialty clinics check that patients are prescribed the appropriate therapy, educate patients and follow patients longitudinally to assess medication tolerance, laboratory monitoring and symptom improvement.

By means of their clinical involvement, they create visits that qualify prescriptions for 340B pricing and serve as a key driver to Geisinger’s distribution channels such as Geisinger Specialty Pharmacy (GSP). Once GSP has the prescription, the specialty pharmacy team enrolls patients into a robust clinical patient management program to meet the standards of dual accreditation with ACHC and URAC. It was a vigorous but overlapping effort — these two clinical teams were often doing similar work for patients prescribed specialty medications by a Geisinger physician.

In 2023, the MTDM specialty and GSP teams were brought together to strengthen their collaboration and improve the care provided to patients on high-cost, high-complexity treatments. The teams identify synergies between services and streamline documentation, clinical care paths and best practice guidelines, cross-training and appropriate time management of patient programs.

As of June 2024, the MTDM specialty team consisted of 45 pharmacists, 39 technicians and 3 inventory specialists. The clinic-based pharmacists averaged 1,400 visits, 4,500 patient encounters and 800 new referrals per month. In the specialty pharmacy, the team filled over 63,000 prescriptions and generated a 78% 340B qualification rate, estimated to be over \$24 million in savings.

Local pharmacogenomics program needs drive innovative approaches

In 2020, Geisinger started a pharmacogenomics (PGx) program to positively influence medication prescribing, with the main goal of improving medication-related outcomes. Laboratory testing often requires clinical protocols to be in place to ensure that critical results can be quickly acted upon. PGx testing is no different — interventions for previously unknown drug-gene interactions must occur for medications that confer significant risk to a patient’s health (e.g., black box warnings, life-threatening adverse events).

Medical literature outlines several models and clinical protocols for evaluating returned results. These models and protocols require significant resource investment, which may involve training all pharmacist staff to know how to interpret and react to PGx findings or identify a central hub of PGx experts through which to route all results. In either case, the models and protocols result in pharmacists needing to review many drug-genomic interactions that do not require intervention because the risk of harm is low. The Geisinger Pharmacogenomics Program identified a gap: how to manage a PGx program that is resource-sensitive and addresses the needs of high-risk patients in a sustainable manner.

To meet these local and suspected national needs, the Geisinger Pharmacogenomics Program developed a novel approach to identifying risk and intervening on returned PGx results. A clinical protocol consisting of a list of critical drug-gene interactions requiring possible intervention, along with intervention steps, was created. In the context of this protocol, a critical drug-gene interaction was one that met either of these criteria:

- Had a suggested agent change or maximum dosage per FDA labeling
- Had potential for life-threatening adverse drug events

All other drug-gene interactions were seen as low-risk and often unnecessary, many times because the patient had a long history of taking the medication without issue or the interaction did not require clinical intervention after the patient began taking a new medication.

In this model, a PGx team member is notified of new PGx results and is prompted to review the patient’s current medication list. The patient’s PGx results and current medication list are then compared with the list of critical drug-gene interactions requiring review and possible intervention. Critical drug-gene interactions discovered during this process are reviewed for possible intervention, which is conducted per protocol.

The official publication of this model in medical literature is expected before the end of this year and is hoped to support other institutions’ program planning and quality improvement efforts.

Centralized Clinical Pharmacy Services expansion

Centralized Clinical Pharmacy Services (CCPS) continues to expand its medication renewal management service further into Geisinger’s specialty service lines, building on the successes of their involvement in community medicine/primary care.

CCPS pharmacists co-manage 100,000+ prescription renewal requests per month for community medicine, adding a unique touchpoint in pharmacy to further expand clinical and operational value, including informing patients of Geisinger’s mail-order pharmacy. CCPS converted over 17,000 medications to mail-order in 2023 and is on track to convert 20,000 by the end of this year due to the specialty renewal expansion.

Since 2020, CCPS has been managing medication-related phone calls for physicians in the medical subspecialties of gastroenterology, neurology and rheumatology. Over time, additional points of entry for CCPS services were added to include electronic messages from pharmacies and patient messages through the electronic health record portal. Today, CCPS manages 4,500 requests per month for these 3 service lines alone.

The strategic expansion of CCPS into specialties is designed to increase mail-order capture rates, improve 340B eligibility compliance, decrease the time to approval for renewal requests and reduce the workflow burden on clinic staff. Additional refill protocols have been created for cardiology, dermatology, endocrinology, hepatology, general surgery, behavioral health, general pediatrics, ophthalmology and urology.

Of these subspecialties, cardiology was the first to be operationalized. CCPS pharmacists handle telephonic, electronic and patient portal refill points of entry for cardiology at Geisinger Community Medical Center, Geisinger Wyoming Valley Medical Center and Geisinger Medical Center, including their satellite sites. Collectively, this has increased renewal volumes in CCPS by 4,000 renewals per month.

On average, CCPS pharmacists respond to cardiology refill requests within 11 hours of receiving the request. CCPS expects to onboard the remaining cardiology sites as well as all points of prescription request entry for endocrinology by the end of 2024. Dermatology, pulmonology and nephrology are expected to be complete by early 2025, with the other specialties to follow.

Geisinger Health Plan diabetes non-clinical enterprise outreach

In June 2023, Geisinger Ambulatory Clinical Pharmacy services and Geisinger Health Plan (GHP) implemented an innovative population health program aimed at improving diabetes outcomes for GHP members who do not have a Geisinger primary care provider.

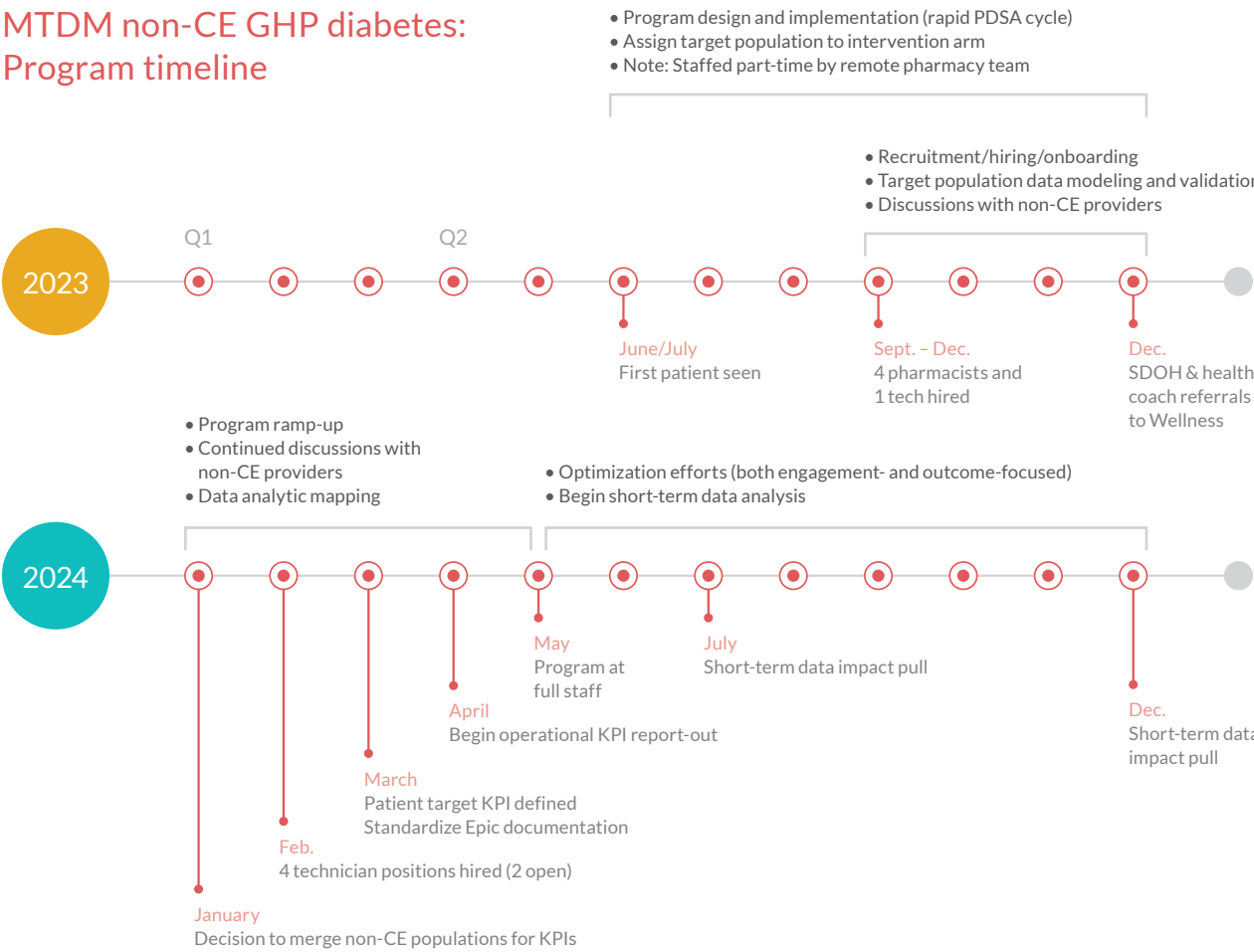
This telephonic outreach model includes a team of Medication Therapy and Disease Management (MTDM) clinical pharmacists and technicians who are internally trained and credentialed in diabetes management. The goal of the program is to improve diabetes control, lower diabetes-related pharmacy and medical spend, improve patient adherence, increase system prescription capture, evaluate patients for appropriateness of statin therapy and connect patients to GHP services related to diabetes.

Our patient population was identified through GHP claims data using the following criteria:

- A1c result greater than 9%
- Pharmacy and/or medical spend greater than \$10,000 annually
- Medication proportion of days covered less than 80%

Based on these criteria, approximately 10,000 GHP members have been identified as eligible for the service. To date, the team has contacted over 3,000 patients, connected 527 patients to Geisinger Mail-Order Pharmacy and referred almost 400 patients to GHP Wellness programs.

MTDM non-CE GHP diabetes: Program timeline



GHP tilt: Population health and implementation of graduation criteria

The Population Health Transformation Committee set forth an initiative for the Medication Therapy Disease Management (MTDM) program to ensure MTDM clinical pharmacists are managing the high-risk patients with Geisinger Health Plan who have diabetes with an A1c greater than 8% or on insulin.

At program onset, approximately 4% of patients being managed by the MTDM program had an A1c less than 7%, were not on insulin and had no other comorbidities, thereby no longer meeting criteria for high risk. Additionally, pharmacists with MTDM had high patient volumes and needed to focus their efforts on those who were considered at high risk. To focus on patients of the highest risk, a graduation workflow was implemented (see Figure 1) to return those who were of the lowest risk back to their primary care provider for continued follow-up. Patients with an A1c less than 7% who were not using insulin to manage their diabetes were graduated from the MTDM program.

Regardless of A1c, some patients remained in the program to maintain routine monitoring and avoid potential complications related to their diabetes or medications. For example, patients who were taking insulin or on an insulin pump, who had a hypoglycemic or hyperglycemic episode requiring medical intervention in the past 3 months, or who were seen or admitted in an acute care facility in the past 3 months related to their diabetes were not graduated from the program.

For those graduated back to their primary care provider, a monitoring program is in place to detect regression back to a high-risk state and re-establishment with the MTDM pharmacist team.

Since beginning this initiative, MTDM has graduated 1,219 patients and 97% of the patients meeting with the MTDM program for diabetes-related medication management meet the eligibility criteria to be considered higher risk (see Figure 2).

Figure 1. Diabetes graduation workflow and checklist

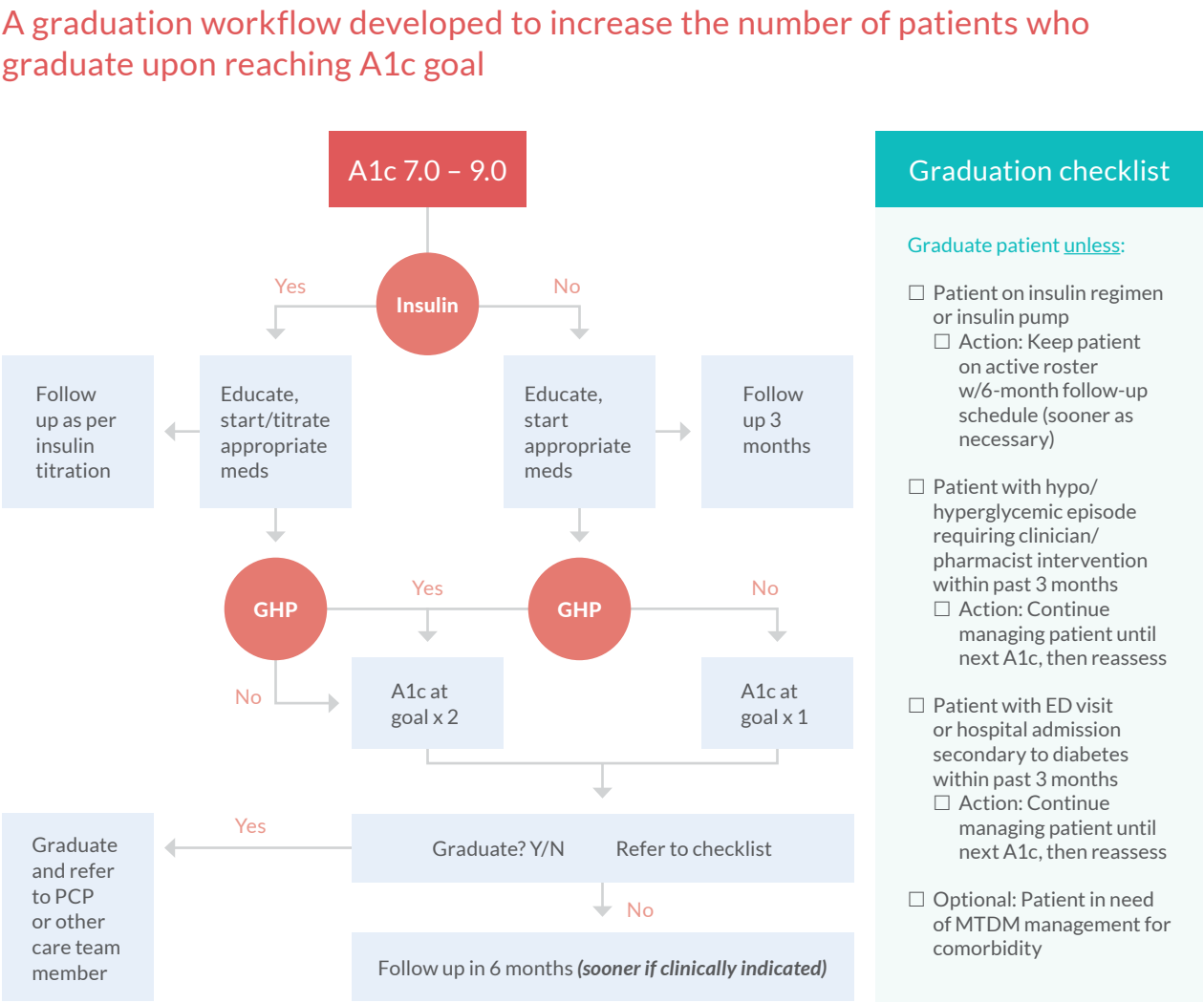
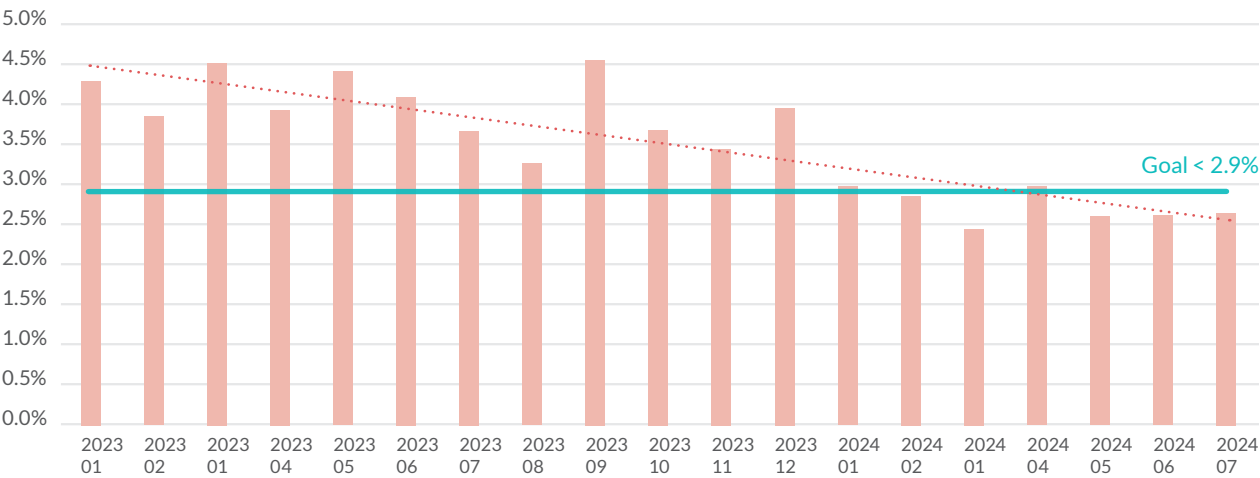


Figure 2. Reduction in number of low-risk patients being managed by MTDM pharmacists

“Managed” members meeting graduation criteria



MTDM services for LIFE Geisinger

LIFE Geisinger is a Center for Medicare and Medicaid Services (CMS) Program for All-Inclusive Care for the Elderly (PACE) program designed to address the unique needs of community-dwelling patients age 55+ who require nursing facility level of care but wish to remain at home. The program has 5 locations across Geisinger’s footprint and provides care for over 500 participants.

Over the past 2.5 years, Medication Therapy Disease Management (MTDM) services have expanded from 1 part-time pharmacist, providing operational and regulatory support, to 3 full-time pharmacists and 4 pharmacy technicians. This integrated, on-site pharmacy team provides direct patient care to LIFE Geisinger participants. Through collaboration with other LIFE Geisinger staff, Geisinger retail pharmacies and Geisinger specialty pharmacy, initiatives are in place to improve the quality of care for LIFE Geisinger participants.

As part of the LIFE Geisinger team, pharmacists with the MTDM program focus on medication management opportunities for chronic diseases, compliance packaging using pre-filled medication sheets and blister packs to promote medication safety and compliance, efforts to reduce hospital/ED utilization, appropriate medication use stewardship and care coordination for high-cost medications.





Mail-order pharmacy growth and accreditation

Starting in July 2023, Geisinger Mail-Order Pharmacy converted from McKesson's Enterprise operating system to Epic Willow Ambulatory (WAMB) for prescription processing and management. WAMB allows mail-order to be fully integrated into Epic Hyperspace. The conversions success, including efforts to zero out all queues at the high-volume operation, was driven by cross-training efforts from multiple pillars in Geisinger Enterprise Pharmacy. Additional efforts from the remote support team and on-site production line team supported the processing of prescriptions throughout the first 100 days to maintain best practice service levels throughout the transition.

To keep up with mail-order's operational growth, the production line needed to increase output through a multiphase expansion. Phase 1 was completed before the operating system conversion in spring 2023. Phase 2 began after WAMB conversion and completed in October, expanding the line filling capacity from 4,000 to almost 7,000 prescriptions per 8 hours. The expansion included adding 5 more automated dispensing robots, 4 picking stations, another pharmacist verification station and 5 packing stations.

To fully staff the expanded production area, the mail-order team grew to 84 employees, including 18 pharmacists, 54 technicians and 12 support associates to manage the call center and production operations. The expansion resulted in significantly improved turnaround times. Mail-order filled over 1.1 million orders from July 2023 to July 2024, and over 101,000 prescriptions in our peak month.

Mail-order continued its successful endeavors in 2024 by seeking its first accreditation from the Utilization Review Accreditation Commission (URAC). URAC is the independent leader in promoting healthcare quality and patient safety through renowned accreditation programs. To meet URAC standards, policies and procedures with defined parameters were developed to ensure high-quality patient outcomes.

Preparation began in 2023 in collaboration with the Pharmacy Compliance and Quality Team and concluded in May 2024, with mail-order achieving a 100% score and earning its first URAC Accreditation. This achievement allows us to attract new potential payor contracts to further increase prescription capture opportunities. This accreditation is effective until June 2027, when re-accreditation will begin.

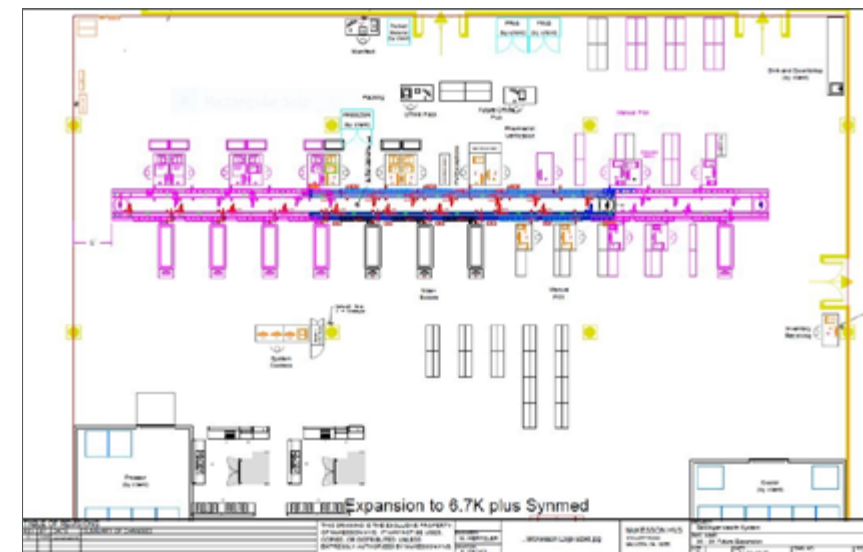


Image 1: Blueprint of Mail-Order Production Area: Pink highlights note the Phase #2 expansion from the original blue conveyor spine

Meds to Beds

Patients enrolled in the Meds to Beds program have discharge medication orders delivered to their bedside by Geisinger Outpatient Pharmacy. Meds to Beds is a program designed to deliver upon Geisinger’s vision of making better health easier, and it aligns with system strategic priorities of managing total health, operational excellence and access and ease of use.

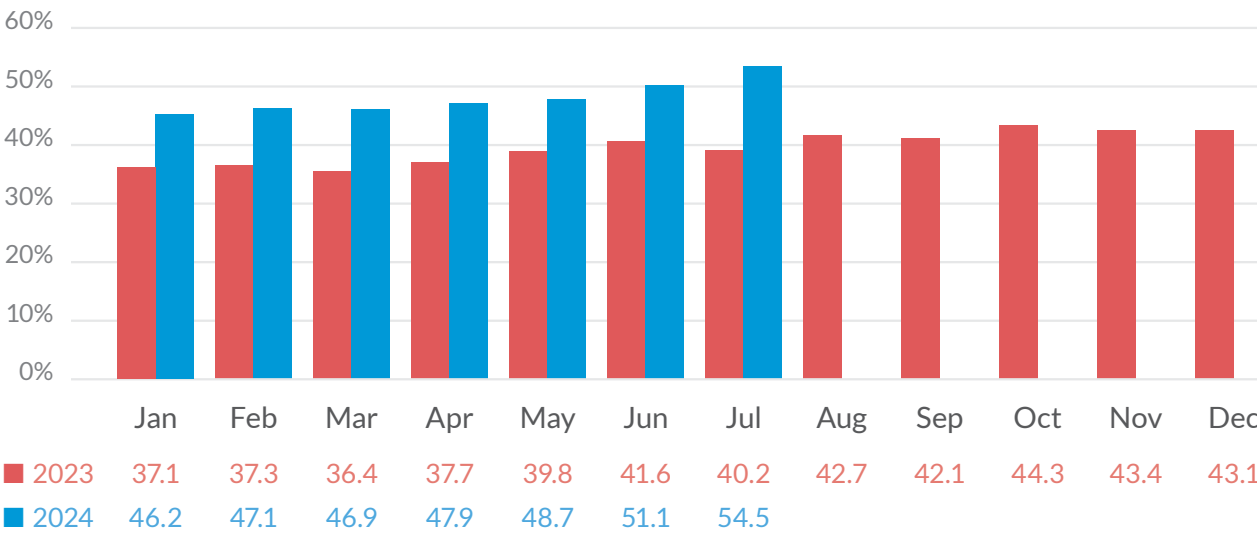
In 2023–2024, the Meds to Beds program saw a significant revitalization, driven by a systemwide effort that encompassed multidisciplinary workgroups and the pharmacy team. Our workgroups included representation from informatics teams, providers, nursing, inpatient pharmacy and outpatient pharmacy. Involvement from upper leadership bolstered our efforts and helped to pave the way for the following actions:

- Increasing awareness through marketing materials such as patient brochures and digital monitor screensavers
- Standardization in terminology, workflow, communication and education
- Creation of and publication of an interprofessional Meds to Beds Playbook, which consists of a guide to success and includes education, job aids, and other resources
- Workflow optimizations and IT enhancements, which include the addition of scripting in the interested/ enrollment step, more clearly defined delivery time expectations for pharmacy and nursing, and automatic enrollment upon marking interested
- Program expansions, including expanded hours of operation, remote services and emergency department services

As of July 2024, the Meds to Beds capture has shown 8.6% growth from 2023.

Figure 1. Percent of patients discharged from Geisinger facilities using the Meds to Beds program. Numbers across bottom represent % of discharged patients in 2023 and 2024.

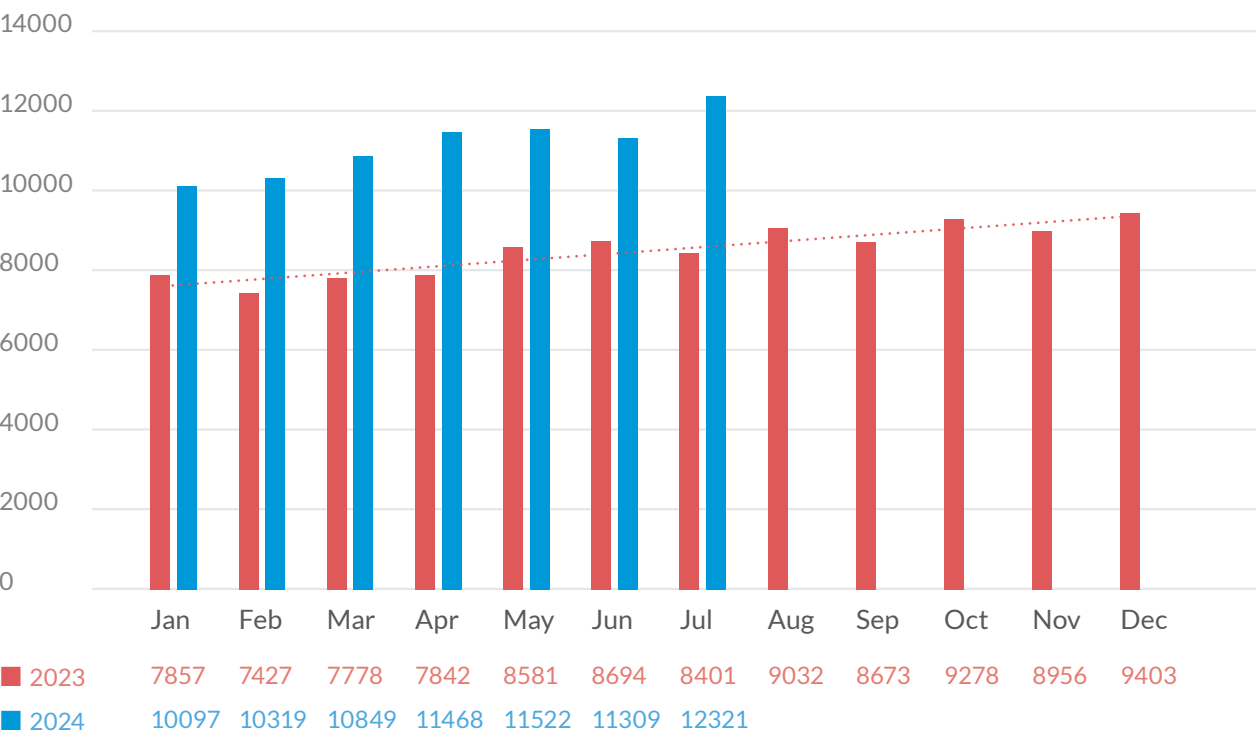
Meds to Beds capture



The prescription volumes have also shown significant increase year over year.

Figure 2. Absolute number of prescriptions filled by Geisinger Pharmacy locations for patients at discharge.

Meds to Beds Rx volume



A particular expansion to highlight for 2024 is that of Acadia Behavioral Health and the use of off-site Geisinger Pharmacy locations to support Meds to Beds initiatives. In February 2024, retail pharmacy, in collaboration with acute care, expanded the Med to Beds service offering to include Geisinger Behavioral Health Center Northeast in Moosic, Pa. This is a remote program, as the pharmacy fulfilling discharge orders is approximately 7 miles from the treatment facility. In a coordinated effort, acute care pharmacy staffing onsite and retail pharmacy staffing are responsible for processing, filling and delivery of all medication orders so they are available for patients to leave with medication in hand at discharge. To date, over 600 patients have received 2,700 prescriptions via this pathway with notable emphasis on the efficiency between the pharmacy teams.

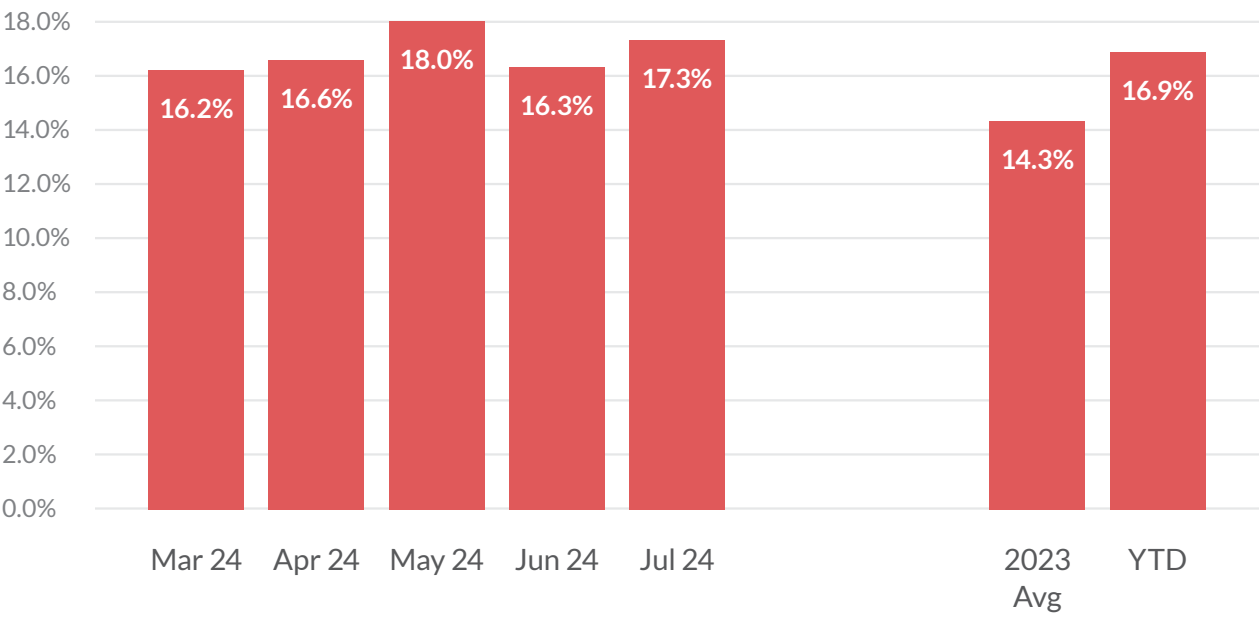
Rx Fast Pass

Rx Fast Pass is a service designed to deliver upon Geisinger’s vision of making better health easier through increasing access and ease of use and through managing total health via the Geisinger Outpatient Pharmacy network.

The goal of Rx Fast Pass is to have patients leave their medical visit at the clinic with medication in hand and to return home for faster recovery — with no need to stop at the pharmacy on the way home. The program is available to all patients, regardless of their prescription insurance provider and fosters a collaboration in the care of a patient between the clinic providers and staff and the Geisinger Pharmacy pharmacists and technicians.

After piloting with family practice at 3 locations with on-site pharmacy in December 2023, the program was expanded in March 2024 to all family practice departments systemwide with an on-site outpatient pharmacy. As of July 2024, acute prescription capture in the family practice departments live with Rx Fast Pass has grown 2.6% from 2023 to 2024.

Acute prescription capture



Specialty relocation and automation

As the specialty drug landscape in the United States continues to expand with a projected growth of 8% year over year, so do the demands on Geisinger Specialty Pharmacy. To meet the needs of its patients and providers, Geisinger Specialty Pharmacy moved from its previous 2,200-square-foot space at Geisinger South Wilkes-Barre to the Northeast Pharmacy Hub in August of this year. This new location is double the size, at 5,400 square feet, and boasts a high-efficiency, automated production line consisting of three Parata Max2+ medication dispensing robots. The addition of this state-of-the-art automation system will increase dispensing efficiency and accuracy and allow the specialty pharmacy team to maintain continued program development and growth.

Acute care

Patient experience pharmacy bookmark

The patient’s experience is key to effective medication management and overall quality of care. Providing a positive experience while ensuring patients have access to their medications and the knowledge to use them is a systemwide priority.

In August 2023, Geisinger Pharmacy went live with a patient experience bookmark in collaboration with the Geisinger Patient Experience team. The goal of this initiative was to provide pharmacists with an icebreaker tool to facilitate effective patient communication. The bookmark highlights Geisinger Pharmacy services available to the patient while they are in the hospital, during discharge and at home, with the goal of establishing trust that we’re here for them every step of the way.

The bookmark also has a QR code to expand access to MyGeisinger, in addition to self-reflection questions that we encourage patients to have answered before discharge. Geisinger Pharmacy continues to pursue opportunities to positively contribute to patient experience, effective communication and enhanced access to medications, including the knowledge to use them.



Geisinger Pharmacy
is here for you

In the hospital
You can trust our pharmacists to review your medications 24/7.

At your bedside
We'll explain your medicine's purpose and any possible side effects.

Before discharge
Get prescriptions at your bedside through our Meds to Beds program. We can help with insurance or cost issues, too.

After discharge
Have your prescriptions delivered right to your door with Geisinger Pharmacy.


Questions? Call us.

- Inpatient pharmacy: 570-703-8090
- Outpatient pharmacy: 570-703-6000
- Mail-order pharmacy: 844-394-3387



Questions to consider


- Do you know why you're taking your medicine?
- Do you understand any restrictions you need to follow when taking your medicine?
- Do you understand how to take your medicine?
- Do you understand the possible side effects your medicine may have?
- Do you know how your medicine can help in your recovery?



Scan this QR code to sign in or sign up for MyGeisinger



Scan this QR code for medical education resources at Medline Plus



Removing barriers to safe IV compounding

Geisinger Pharmacy’s intravenous (IV) compounding space is undergoing a transformation by applying updates to exceed stringent requirements with state-of-the-art clean rooms, renovations to air-handling systems, and implementation of closed system transfer devices (CSTDs). These investments foster a culture of safety and creating a culture of excellence in IV compounding.

Pivot to Equashield CSTD

Equashield is a CSTD designed to enhance safety during the preparation and administration of hazardous chemotherapy medications. Unlike previous systems, which lacked both a locking mechanism and a secure connection design, Equashield features a robust, leak-proof system with an integrated locking mechanism. This advanced technology ensures a completely closed environment, minimizing the risk of staff and patient unnecessary exposure to and contamination by hazardous medications. The use of CSTDs is a regulatory requirement under United States Pharmacopeia 800.

In practice, Equashield is used throughout the entire chemotherapy process. During drug preparation, the device’s specialized vial adaptors and pressure equalization mechanisms create a sealed pathway, preventing the escape of hazardous substances. Similarly, when administering chemotherapy, Equashield maintains a closed system from the vial to the patient, safeguarding healthcare workers and patients alike. This closed system provides an added layer of safety from medication vapors.

Cleanroom renovations and upgrades

Recognizing the importance of maintaining strict temperature, humidity, and pressure parameters, Geisinger Pharmacy recently completed renovations at Geisinger Medical Center’s cancer pharmacy and Geisinger Wyoming Valley Medical Center’s operating room pharmacies.

These renovations, accomplished through collaboration with our facilities team, Johnson Controls, Energy Plus Certification and Valley Balance, included the design and build of brand-new air handlers specifically tailored to support air supply and exhaust requirements. This ensures continuous and reliable operation to sustain daily sterile preparation. The new systems are engineered to maintain a strict temperature limit of 68°F, relative humidity levels between 40% and 60%, and positive pressure differentials essential for preventing contamination to maintain the highest standards of air quality and cleanliness in Geisinger cleanrooms.

Besides these completed renovations, future projects are also in progress, including the construction of a new pediatric pharmacy, where similar advanced HVAC technologies will be implemented. These systems will offer enhanced filtration, energy efficiency and real-time monitoring capabilities, allowing for continuous assessment and precise adjustment of environmental parameters.

By integrating these cutting-edge technologies and conducting regular maintenance and performance audits, Geisinger is committed to the reliability and safety of operations. Our collaborative efforts are central to providing stable, controlled environments that support the precision and quality required for our cleanroom operations. These initiatives incorporating design and build improvements will ultimately enhance our capacity to deliver safe and effective products, maintaining the highest standards of safety and compliance.

Sterile Compounding

Heidi Yanoski

This year, Sterile Compounding leadership has completed an update to all applicable policies and procedures that guide Geisinger’s compliance to standards set forth in the United States Pharmacopeia, Chapter 797, on Nov. 1, 2023.

These updates required substantial changes to staff competencies, including the development of an improved gloved fingertip and media fill testing process, more frequent IV technician testing and the requirement of all pharmacists who verify compounded sterile products to be tested. Furthermore, most cleaning tasks in the Simplifi 797 platform were modified to fit Geisinger’s newly updated system policies. Finally, excellent teamwork on the part of the Sterile Compounding and Pharmacy Informatics teams was harnessed to review and update all beyond use dates for Compounding and Repacking and Dispense Prep records.

Making these changes required a great deal of staff reeducation and was a substantial accomplishment for our acute pharmacy team. We would like to thank every leader and staff member for their support and helping us achieve the goal of maintaining safe and efficient sterile compounding environments.

Additionally, the Pharmacy Stars platform was launched systemwide for cleaning and environmental monitoring task completion on Sept. 3, 2024. This system will aid Geisinger in streamlining compliance activities and training staff in aseptic technique. This is accomplished through enhanced cleaning task customization, the ability to create Geisinger-specific didactic competencies and the addition of written testing on the educational material and applicable system policies at the end of each lesson. The competency section of Pharmacy Stars has an anticipated launch date of Q1 2025.

Formulary & procurement



Drug Supply Chain Security Act

As an integrated healthcare system, Geisinger provides high-quality, cost-effective, evidence-based medication therapy management to more than 1 million residents across counties in central, south-central and northeastern Pennsylvania. Pharmacy services are provided from over 50 pharmacies, including inpatient, outpatient, ambulatory care, home infusion and mail-order.

Geisinger also operates a singular pharmacy distribution center. While this location is technically licensed as a distributor, the Geisinger distribution center does not resell any product outside the Geisinger system: Products are received and verified and then transferred to other Geisinger pharmacy locations. Geisinger works with over 50 vendors, including our primary wholesaler Cencora, to ensure product availability from authorized distributors.

The Drug Supply Chain Security Act (DSCSA) aims to enhance the security of the pharmaceutical supply chain by using serialized data to improve traceability, prevent counterfeit drugs and ensure patient safety. It was passed into law on Nov. 27, 2014, with full enforcement slated for Nov. 27, 2024. Currently pharmacies can capture aggregate data from wholesalers and manufacturers, but serialized data will give us the ability to track medications from the manufacturer to the end user.

Geisinger will be engaging with our DSCSA partner, ConsortiEX, to stand up Verify on Receipt and ScanCast. This will allow the system to develop best practice standard operating procedures for handling DSCSA requirements, including serialization, traceability, verification, reporting for suspect or illegitimate products and recordkeeping requirements for the system. This technology will allow us to address serialization requirements and integrate the receiving process directly with Epic Willow Inventory.

Geisinger Pharmacy’s objective is to continue to drive DSCSA readiness, not only across the enterprise but also across the industry.

Medication shortages

Medication shortages have long been a cause for concern among healthcare providers. However, over the past few years the quantity and severity of medication shortages has significantly worsened, requiring additional resources to be allocated to management of these backorders. Over the past 12 months, we have seen medication shortages impact critical categories of medication, such as chemotherapy, that were not previously affected. All of this highlights the increasing burden being placed on healthcare providers, operationally and financially, due to the growing problem.

An overall lack of transparency is a significant issue. Many times we don’t learn about a shortage until our buying team attempts to purchase a medication and our supplier informs us we cannot get it due to a backorder.

The Pharmacy Procurement team has taken several steps to mitigate the impact of this lack of transparency. We partnered with LogicStream Health, an external company that specializes in medication shortage management. Using their tool, we are able to better manage shortages, which has made our process more efficient.

More importantly, we’ve gained access to a stream of information from various external sources that provides proactive notification of potential upcoming drug shortages. This provides an opportunity to proactively address a potential drug shortage instead of having to manage it reactively.

Another mitigation effort we have undertaken is identifying and participating in guaranteed supply programs. These programs are typically offered by drug wholesalers and group purchasing organizations and function by earmarking a supply of identified medications that is accessible solely by Geisinger. If the fair share supply of a medication is exhausted at the wholesaler, we can tap into this earmarked supply through the guaranteed supply program to continue obtaining the medication.

The inevitable reality is that despite best efforts, we will be impacted by medication shortages. When that happens, we leverage a refined process that includes a multidisciplinary team approach.

The Pharmacy Procurement team confirms a shortage situation and learns the scope of the shortage. The Pharmacy Clinical Specialist team is then consulted to determine appropriate clinical alternatives to the backordered medication. The Epic EMR serves as our electronic documentation system, and as such, the Pharmacy Informatics team plays a critical role in completing required build in Epic to provide guidance and support to providers about drug shortages and recommended alternatives.

It truly requires a team effort across all of these groups, in addition to others, to keep our patients from being negatively impacted by a medication shortage.

Hematology & oncology

Cancer services and home infusion collaboration

Guided by Geisinger’s pursuit of excellence and innovation, and with the mission to empower communities to do well by removing barriers, the Hematology & Oncology Pharmacy Team is committed to expanding access to vital services for cancer patients across our system. Our team is dedicated to ensuring that patients across central and northeastern Pennsylvania have access to these innovative therapies.

Through operational efficiencies and clinical expertise, we strive to remove barriers and provide support for our patients on their cancer journey. One example can be found in the Blinatumomab Therapy Home Infusion Collaboration.

Blinatumomab, a bi-specific T-cell engager therapy, has transformed the treatment landscape for patients with adult and pediatric acute lymphoblastic leukemia (ALL). Administered as a 24-hour continuous infusion for 28 days, this therapy historically required patients to travel to the clinic for bag changes.

To improve patient access and convenience, Geisinger’s Hematology & Oncology Pharmacy Team collaborated with the Geisinger Home Infusion Team to offer in-home infusion changes as well as additional infusion change locations in the Western and Northeast regions. Patients with ALL on blinatumomab can now better use Geisinger Home Infusion Services, tailoring administration needs for specific patients and increasing convenience during treatment.

CAR-T program initiation

Pharmacists are crucial members of the Cancer Institute Cellular Therapy Program in providing essential hematopoietic cellular therapy pharmaceutical services. Geisinger now offers chimeric antigen receptor T-cell (CAR-T) therapies as a therapeutic option for patients.

Pharmacists were instrumental in developing clinical guidelines, operational components, and informatics to facilitate CAR-T therapy administration. In June 2024, the institute infused the system’s first CAR-T product and has since seen an increase in patients using this therapy. Pharmacy remains committed to supporting the expansion of CAR-T and gene therapy products at Geisinger.

Geisinger Oncology and Infusion Services service line expansion

Geisinger Home Infusion Services (GHIS) opened a new satellite location in Wilkes-Barre, Pa. This expansion represents a significant milestone for the program, as the new 2,600-square-foot facility will allow Geisinger to better serve the growing northeast client base.

The satellite location is part of the Northeast Hub complex, which also houses the Specialty Pharmacy and Centralized Clinical Pharmacy Services divisions. The new space will feature a state-of-the-art on-site pharmacy with 3 horizontal flow hoods, 3 biosafety cabinets and a total parenteral nutrition compounding hood. This meticulously controlled environment will allow for preparation of high-quality sterile medications, both hazardous and non-hazardous. This is largely in part due to the modular cleanroom design and build. Using a modular platform, the room is built off site, disassembled and shipped to the location to be built. This ensures all aspects of the room are accounted for and within specifications. The modular build allows for fast construction time and the high-end material helps to ensure tight control of the cleanroom environment.

In addition, the facility includes a 1,200-square-foot ambulatory infusion suite with 4 treatment bays, a nursing station, a nourishing area, a waiting room and a reception area. This welcoming space will provide infusion services on-site to a variety of patient populations, including those transferring from hospital-based infusion sites, pediatric patients, those requiring higher-risk therapies and patients who do not meet criteria for home infusion.

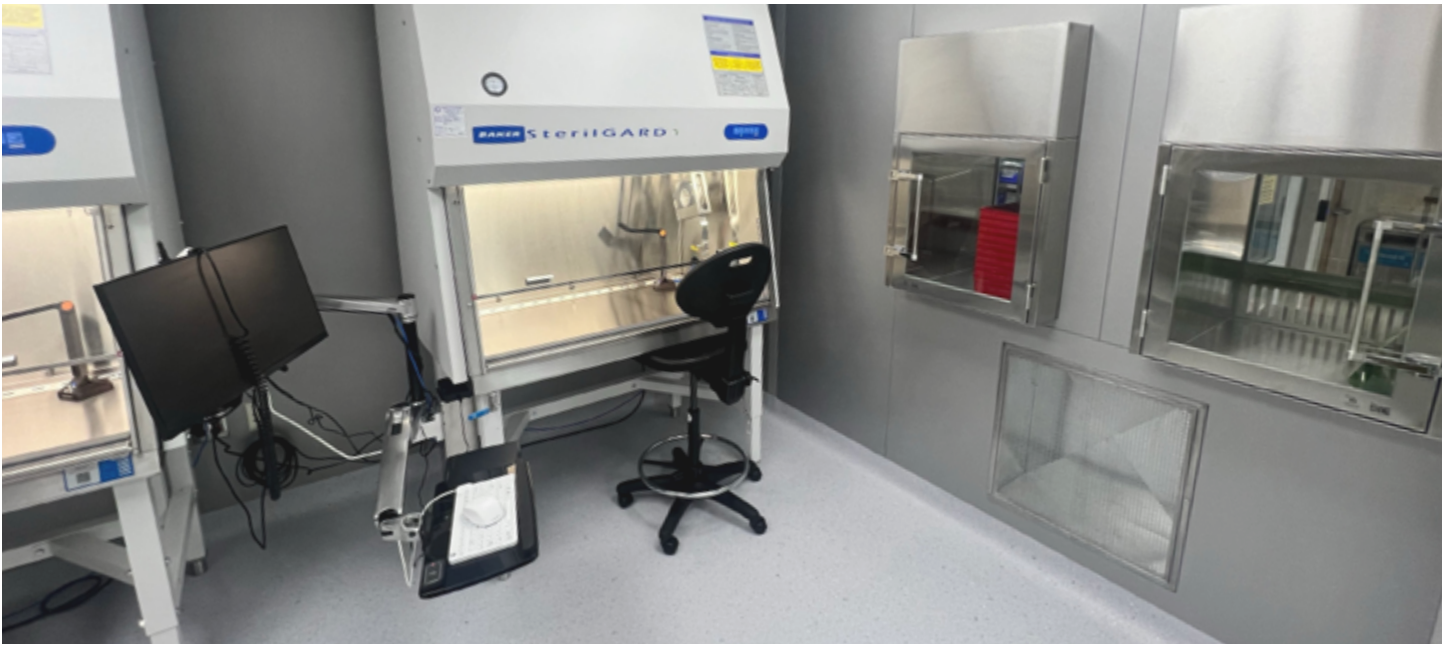
By strategically situating this new satellite location, Geisinger will offer improved geographic coverage and accessibility to a full suite of services. The expanded footprint and resources will enhance the ability to deliver exceptional service and support to the growing northeast patient population.

Geisinger Home Infusion Services is poised to further expand its reach and enhance patient care with the introduction of a new Home Infusion Suite in our Western Region. This state-of-the-art facility, to be located at 428 Windmere Drive in State College, Pa., represents a strategic investment to meet the growing demand for home infusion services in the area.

Recent changes, including the conversion of Scenery Park to a hospital outpatient site and evolving site-of-care initiatives, have highlighted the need for more accessible and convenient home infusion options for patients. The existing setup has shown limited capacity to manage the increasing demand, resulting in potential revenue leakage and care gaps for those requiring these essential services.

The expansion to the Western Region demonstrates GHIS’ proactive approach to addressing identified opportunities and needs within the system. Since its opening in May 2022, the Windmere location has successfully extended the reach of Geisinger’s home infusion program. The addition of a new 3-chair suite at this site will bridge existing care gaps, cater to a more affluent demographic and capture additional market share. Designed to serve between 2 and 8 patients daily, the proposed Home Infusion Suite will be staffed by GHIS Nursing, ensuring a dedicated and experienced team to deliver exceptional care.

This addition of the home infusion suite to the Windmere pharmacy marks a significant advancement for Enterprise Pharmacy in the Geisinger system. This initiative addresses critical gaps in patient care, captures substantial revenue opportunities and enhances operational efficiency. These improvements align with Geisinger’s strategic goals of expanding access to home infusion services and strengthening its market position. With the projected benefits, the new suite is poised to contribute significantly to the continued growth and success of Geisinger Home Infusion Services.





Post-transplant vaccination clinic-based replacement program

The cellular therapy program continues providing access to hematopoietic cellular therapy services in our communities. Our pharmacists are integral members of the multidisciplinary team, offering extensive medication and disease state management for patients following allogeneic and autologous stem cell transplants. Re-immunization with vaccines is crucial for post-transplant care, providing lifelong immunity to common pathogens.

To address the complexity of vaccine coverage, Gwen Hua, PharmD, BCOP, led an initiative in collaboration with Geisinger Retail Pharmacy to provide clinic-based vaccination replacement. This program ensures vaccines covered under prescription benefits are sent to the clinic for administration during routine visits, enhancing patient convenience and minimizing out-of-pocket costs.



CPIO

Comparison of Type 2 diabetes pharmacotherapy regimens using targeted learning

Geisinger research team: Sarah Dombrowski, Eric Wright, Vanessa Hayduk, Meredith Lewis
Funding: Patient-Centered Outcomes Research Institute (PCORI), 2020–2025

As we know, patients with Type 2 diabetes are at an increased risk of cardiovascular disease (e.g., stroke, myocardial infarction, death). Recent evidence has revealed that some antidiabetic therapies lead to a reduction of cardiovascular risk, but questions remain regarding how these medications compare with one another in effectiveness. Geisinger is participating a PCORI-funded research study in collaboration with Kaiser Permanente Northern California (KPNC), Southern California (KPSC) and Hawaii, as well as Henry Ford and HealthPartners Institute health systems to assess second-line treatment of Type 2 diabetes beyond metformin. The study utilizes electronic health record (EHR) and health insurance claims data from the 6 health systems from 2014 to 2023 and includes people with Type 2 diabetes taking 1 of 4 classes of glucose-lowering medicines: sodium-glucose cotransporter 2 inhibitors (SGLT2i), glucagon-like peptide-1 receptor agonists (GLP-1 RA), dipeptidyl peptidase 4 inhibitors (DPP-4i) and sulfonylureas (SU). The research team is assessing how a patient’s cardiovascular outcomes change based on the medication used, when patients initiate therapy and different individual characteristics such as age, race/ethnicity and comorbidities. One particularly important aspect of the study is the involvement of patients with Type 2 diabetes, caregivers, clinicians and health insurers as stakeholders in designing and conducting the study.

Each site involved in the study is conducting sub-analyses of the cohort around topics including mental health, dementia, hypertension, medication adherence and more. One paper published from this group showcased disparities in prescribing of SGLT2i and GLP-1 RA medications based on patient race and ethnicity, where patients identifying as white or Caucasian were more likely to be prescribed SGLT2i and GLP-1 RA classes of medicines. The causes for these differences are yet to be determined. Additionally, this study aims to compare primary and secondary medication adherence and persistence of diabetes medications specifically in older adults (> 65 years old) across the United States in regard to class of medication, common comorbidities, race/ethnicity and type of insurance. The goal is to bring more clarity to medication selection as clinicians attempt to rectify practice-based guidelines with age-specific patient considerations (e.g., polypharmacy, cost) to select optimal medication regimens for older adults with Type 2 diabetes mellitus.

We look forward to sharing the results of the study and each sub-analysis over the coming years, as well as to future collaborations with the research team. The partnerships from this study have led to submission for an extension of the project to continue the analysis to include long-term impact of these therapies as well as numerous supplemental grant submissions. Multiple manuscripts are in preparation/submission at the time of this report.

Ongoing innovative strategies in headache and migraine care: A comprehensive system report

Headache, including migraines, remains the second most common cause of disability, with 1 in 3 patients being referred to neurology from primary care. Research has demonstrated that barriers to primary care-based management of headaches include a lack of expertise to accurately diagnose and treat migraine, which results in higher referrals. However, access to neurology remains a challenge, considering the long wait times, resulting in many patients remaining undermanaged in the interim and turning to emergency care settings for their episodic needs.

To bridge this gap and ensure quality care is delivered to our patients, Geisinger designed two primary care-based initiatives. Stakeholders from primary care, IT, neurology and pharmacy came together to develop an EHR-based alert to assist PCPs in managing headaches and migraines. The tool included a questionnaire that could help PCPs diagnose headache disorders, a “smartset” that could guide medication management and an ask-a-doc feature that allowed electronic consultations with an on-call neurologist. Iterative improvements were made to this tool since its first implementation in March 2021 based on feedback from PCPs and results from a rigorous scientific evaluation. Following the latest batch of iterations to the tool made in August 2022, it was observed that between September 2022 and September 2023, there was an overall decline of 38% in the number of headache referrals to neurology, while the number of patients initiating medication management at the guidance and prescribing of the PCPs almost doubled when compared to 2021.

To further support medication management among these patients, the migraine MTDM program was started in January 2022 and, by May 2023, was sequentially expanded across the system. This program was intended to improve headache and migraine care for patients by optimizing medication regimens. Pharmacists were trained to confirm clinical history, assess baseline disease burden, provide education and follow treatment protocols to prescribe preventive and abortive treatment options. As of May 2024, the program had enrolled 184 patients. At baseline, patients surveyed reported an average of 15 monthly headache days. Information on headache days per month was available for 44% (81/184) patients at follow-up, and 69% (56/81) of these patients reported experiencing fewer headache days at their last visit. Furthermore, at baseline, 51% (94/184) patients had tried preventive therapy, and 88% (162/184) patients had tried abortive therapy. Among the patients who were treatment naïve at baseline, 61% (55/90) were initiated on preventive medication, and 91% (20/22) were started on abortive therapies.

In an effort to harmonize migraine care across the system, a novel initiative called the Virtual Headache Hospital (VHH) was developed and activated in the late summer of 2023. This program continued to build on the momentum generated by the earlier initiatives by identifying high utilizers of system resources and streamlining migraine management through multidisciplinary teams. The VHH has led to consistent patient education among the various migraine care team members and resource alignment throughout the workflows by building an infrastructure to ensure patients' appropriate transition of care and handoff needs are met. This multipronged, multidisciplinary approach is expected to reduce unwarranted neurology referrals and ER utilization and improve the care and quality of life for our headache patients across the system, resulting in a win-win for all our stakeholders.

Geisinger Health Plan

Inflation Reduction Act and the Medicare Prescription Payment Plan

January 2025 will introduce the Medicare Prescription Payment Plan (M3P) as part of the Inflation Reduction Act of 2022. This plan will allow for those enrolled in Medicare Part D plans to elect to pay an estimated monthly charge to cover the annual out-of-pocket costs for their prescriptions instead of point-of-service copays when receiving prescriptions. Programs like this may benefit those who have high up-front costs or gaps in their Medicare Part D plans where one-time out-of-pocket expenses may be too much to pay. As a provider of Medicare Part D programs (Geisinger Gold), Geisinger Health Plan is partnering with Navitus, our claims processor, and their M3P solution SimplicityRx to provide member support for M3P. SimplicityRx will provide Tier 1 customer support for GHP members, which includes live agent support to field member questions and assist with M3P elections. Geisinger Health Plan members will also have access to SimplicityRx's online portal to enroll and/or make payments.

Keytruda white-bagging

White-bagging for Keytruda® was implemented on March 1. The prior authorization team coordinated with the medical drug team to ensure success through streamlining workflows. The prior authorization representatives ensure that requests coming in for Keytruda are following the new white-bagging procedure for our Commercial populations.

In lieu of buying and billing Geisinger Health Plan, prescribers are now required to obtain the medication from a contracted preferred specialty pharmacy. White-bagging ensures safety and integrity in the pharmaceutical supply chain while also reducing drug costs. In the first 4 months, the program has generated more than \$2.5 million in savings. An additional 18 drugs are already in the pipeline to be added to the program before the end of 2024.

Geisinger Gold Comprehensive Medication Review Program

As part of the Medicare Part D program, Geisinger Health Plan (GHP) is evaluated on the number of eligible members it connects with to complete a comprehensive medication review (CMR). Eligible members typically have a predetermined number of conditions, medications and medication costs to qualify for these reviews.

The early results for calendar year 2023 for the Medication Therapy Management (MTM) CMR Program shows Geisinger Pharmacy team members connected with 93% of eligible Geisinger Gold Medicare Advantage members to complete the reviews. This is in line with calendar year 2022, when the Centers for Medicare & Medicaid Services (CMS) rating met the requirements for 5-Star. While the final results and CMS ratings for 2023 have yet to be released, we strongly believe that 2023 results should align again with the 5-Star requirements of the program.

The MTM Program documentation efforts were moved to Epic starting Jan. 1, 2024, to increase efficiencies for CMR completion. Previously, documentation and reporting were conducted by a vendor, Outcomes. This process resulted in double documentation and elongated processes and introduced more opportunities for errors. The move to Epic has eliminated these redundancies to allow team members more time to be engaged with patients. On top of the reporting and documentation being moved to Epic, there was also a change in follow-up outreaches or targeted medication reviews (TMRs). CMS requires these as well for all members who qualify for a CMR. Through the internalization of the reporting, TMRs were more streamlined, resulting in less false positives by incorporating both pharmacy and medical claims.

As calendar year 2024 unfolds, we are seeing a considerable increase in the number of members who qualify for a CMR. The team and process are thriving because of a more streamlined approach and constant desire to do the right thing for GHP’s Medicare members.

Geisinger Health Plan partners with OncoHealth

In 2024, Geisinger Health Plan (GHP) contracted with OncoHealth to provide supportive cancer care services. This partnership supplements GHP oncology resources with medical expertise and member-oriented programs to be sure patients with cancer receive the most appropriate treatment regimen and to help them manage their cancer. For most of the GHP member population, GHP will fully delegate the utilization management of pharmacy and medical benefit oncology and related supportive care drugs to OncoHealth, who has a dedicated staff of board-certified medical oncologists, hematologists, radiation oncologists and pharmacists specializing in evidence-based treatment of oncology conditions.

In addition to the OneUM™ utilization management component, OncoHealth has a patient-centered program called Iris™. This voluntary program provides patient resources such as 24/7 digital access to cancer specialists for treatment and side effect information, nutrition advice, emotional support and access to a network of peer mentors.

Partnering with OncoHealth will allow GHP to ensure its members receive the most appropriate treatment and support through the duration of their treatment while also mitigating the rising costs of oncology care. The first phase of the program went live May 21, 2024, and additional phases will be rolled out throughout the year.

Geisinger Health Plan prior authorizations

In 2023, nearly 100,000 prior authorization requests were processed by pharmacists and pharmacy staff in Geisinger Health Plan. This is a 21% increase in requests from the previous calendar year. The requests consisted of 85,718 pharmacy benefit drugs and 14,174 outpatient medical drugs. Out of these requests, 66% were approved or partially approved.

With Navitus implementation in January 2024, a portion of the conversion efforts were to ensure reliable communication between the prior authorization processing platform and the new claims processing platform and the application was working correctly. Additional work is planned for this portion of the conversion and future upgrades will focus on improving functionality for users to submit authorization requests.

Knowledge management



Geisinger Pharmacy Scholars Program

The Geisinger Pharmacy Scholars Program was established to develop relationships with schools of pharmacy to provide educational opportunities, internships and financial support for a select group of high-performing students enrolled in pharmacy school. Through the Geisinger Pharmacy Scholars academic partnerships, students gain first access to Geisinger and secure employment with the system following graduation from pharmacy school.

Students enter the program as first-year college students, preparing themselves to enter the professional pharmacy curriculum at either Wilkes University or the Philadelphia College of Pharmacy at St. Joseph’s University. They apply as graduating seniors or incoming first-year students. If their application shows evidence of high academic achievement, they meet to discuss it with an interview board. Students selected for the program are paired with a Geisinger pharmacist as a mentor to maintain their connection to pharmacy and Geisinger throughout their schooling. Those in the Geisinger Pharmacy Scholars Program also have access to summer employment opportunities, preferred access to pharmacy practice experience and guaranteed employment following graduation.

Upon entering their third professional year of school, students are provided a \$20,000 academic loan that may be repaid through employment with Geisinger following their graduation from pharmacy school or pharmacy residency.

To date, there are 19 students enrolled as Geisinger Pharmacy Scholars, with 6 students beginning their first professional year in the fall of 2024. The first cohort of Geisinger Pharmacy Scholars will graduate in the spring of 2028, and we expect to have 8 new graduates every year thereafter join Geisinger through the Scholars Program.

Pharmacy Co-Op Program

Geisinger Pharmacy partners with numerous regional school districts to offer high school seniors a cooperative (co-op) experience as part of their education. Across Enterprise Pharmacy, we host co-op students in all our facilities and services, including hospitals, retail locations, mail-order pharmacy, home infusion services and centralized clinical pharmacy services. These programs offer students educational experiences in a pharmacy setting with hopes of seeing them move on to positions as pharmacy technicians and/or pursuing a career as a pharmacist.

In the 2023–2024 school year, Geisinger Pharmacy hosted 18 co-op students from the following regional high schools:

- Bloomsburg Area High School
- Columbia-Montour Area Vocational Technical School
- Crestwood High School
- Danville Area High School
- Mifflin County High School
- Montgomery Area High School
- North Schuylkill High School
- Northwest Area High School
- Our Lady of Lourdes Regional High School
- Scranton High School

We plan to continue expanding the program and are always looking for new partner high schools.

Pharmacy Residency leadership & graduates (2024)

Geisinger Clinic Central PGY1

Program leadership:
Jennifer Heikkinen (director) and Catherine Haupt

Graduates:
Chidubem Ifeji and Morgan Casciole

Geisinger Medical Center PGY1/PGY2 Health System Pharmacy Administration & Leadership

Program leadership:
Sarah Hale (director)

Graduate:
Nichole Varela-Gonzalez

Geisinger Clinic Northeast PGY1

Program leadership:
Michael Kachmarsky (director) and Brian Bedwick

Graduates:
Hailey Knittle and Taylor Warner

Geisinger Medical Center Critical Care PGY2

Program leadership:
Angela Slampak-Cindric (director)

Graduates:
Ji-Yeon (Liz) Kim and Alexandria Lehman

Geisinger Clinic West PGY1

Program leadership:
Sarah Dombrowski (director) and Elena Marines

Graduate:
Kirsten Mascaritola

Geisinger Medical Center Oncology PGY2

Program leadership:
Tristan Maiers (director) and Kayla Hart

Graduates:
Gionna Knauss and Maria Saimbert

Geisinger Community Medical Center PGY1

Program leadership:
Michael Fox (director) and Christopher Defrancesco

Graduates:
Patrick Bell and Timothy Hendershot

Geisinger Wyoming Valley PGY1

Program leadership:
Sarah Siemion (director) and Jennifer Sekelsky

Graduates:
Scott Mitsko, Ashlyn (Grace) Narins and Molly Rinkevich

Geisinger Medical Center PGY1

Program leadership:
Sara Gaines (director) and Amy Brokenshire

Graduates:
Sewit Araia, Mahbuba Choudhury, Cassandra Lombardo and Dominick Patafio

Geisinger Wyoming Valley PGY2

Program leadership:
Jamie Kerestes (director) and David Moll

Graduates:
Lauren Proctor and Drew Schmucker



Chidubem Ifeji



Morgan Casciole



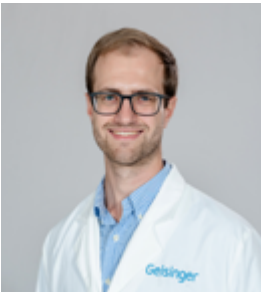
Hailey Knittle



Taylor Warner



Kirsten Mascaritola



Patrick Bell



Timothy Hendershot



Sewit Araia



Mahbuba Choudhury



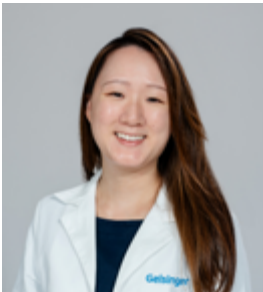
Cassandra Lombardo



Dominick Patafio



Nichole Varela-Gonzalez



Ji-Yeon (Liz) Kim



Alexandria Lehman



Gionna Knauss



Scott Mitsko



Ashlyn (Grace) Narins



Molly Rinkevich



Lauren Proctor



Drew Schmucker

Pharmacy residency preceptors of the year

Each year, our residency programs come together to identify a preceptor of the year — one member of the team who has made outstanding contributions to the residents, the residency program and their fellow residency faculty. Nominations for preceptor of the year may come from residents, colleagues or residency leadership. We are pleased to have the following team members selected as preceptors of the year for their respective programs.

Briannan Budzak
PGY1 Geisinger Community Medical Center

Keturah DelGrosso
PGY1 Geisinger Clinic West

Sydney Estock
PGY1 Geisinger Wyoming Valley Medical Center

Catherine Haupt
PGY1 Geisinger Clinic Central

Rachel Hopper
PGY2 Critical Care Pharmacy Residency

Christina Kalechitz
PGY1 Geisinger Clinic Northeast

Staley Lawes
PGY1/2 Health System Pharmacy Administration & Leadership

Rachael Straining
PGY2 Oncology Pharmacy Residency

Emma Wysocki
PGY1 Geisinger Medical Center

At the end of the academic year, the residency leadership team selects a systemwide preceptor of the year from all those receiving program-level preceptor of the year accolades. The person chosen as system preceptor of the year has an exemplary influence on residents, resident programs and residency faculty throughout the year. **For the 2023–2024 academic year, the system preceptor of the year was awarded to Staley Lawes.**

Her nominator included this as part of the nomination:

“I have had the opportunity to observe Staley's tremendous impact as a pharmacy residency preceptor within the PGY1/PGY2 HSPAL program as well as across the PGY1 and PGY2 Critical Care residency programs at Geisinger Medical Center. What sets Staley apart...is the thoughtful and timely feedback that she provides. She is a knowledgeable and insightful reviewer who provides exceptional guidance and feedback to the residents to further their progress.”

Operations & compliance

Geisinger 340B program

Since its inception in 2008, the 340B program at Geisinger has undergone important expansion. What started as a single-hospital program now has reach into 5 system hospitals, 166 child sites and 185 contracted pharmacies. Just in 2024, the 340B team has stood up two Ryan White clinics — one in Danville and one in Lewistown — each with two contracted pharmacies.

This growth and expansion continued despite the ongoing imposition of program restrictions. At the time of this report, 37 manufacturers have imposed contract pharmacy restrictions, and several have continued to tighten their allowances from their initial imposition. Fortunately, through the continued work of the 340B team, Geisinger has been able to maintain pricing to entity-owned pharmacies as well as to many Geisinger wholly owned stores. Working with the procurement team, pharmacy support team and pharmacy leaders, Geisinger has been innovative in maintaining savings for Geisinger-owned stores. As the program goes, so does the use of technology to help identify trends and opportunities. The team uses applications such as 340B ESP to review usage and purchases and ensure the system is not over-purchasing on a 340B account.

Automated dispensing cabinets and institute for safe medication practices

The Institute for Safe Medication Practice (ISMP) guidelines are designed to prevent medication errors and ensure safe medication practices. Aligning automated dispensing cabinets with ISMP recommendations is a significant step toward enhancing medication safety. Upon initial review, Geisinger identified an 85% compliance rate across the 119 suggestions from ISMP, reflecting a strong commitment to patient safety and a proactive approach to incorporating best practices. We need to continue this momentum and address the remaining 15% to achieve full compliance. Key to this is ongoing review of the specific areas where opportunities exist to continue implementing recommendations and developing a plan to facilitate change. By doing so, our Geisinger healthcare providers will minimize the risk of medication errors and improve the overall safety of the medication delivery system.

Key elements finalized in 2024:

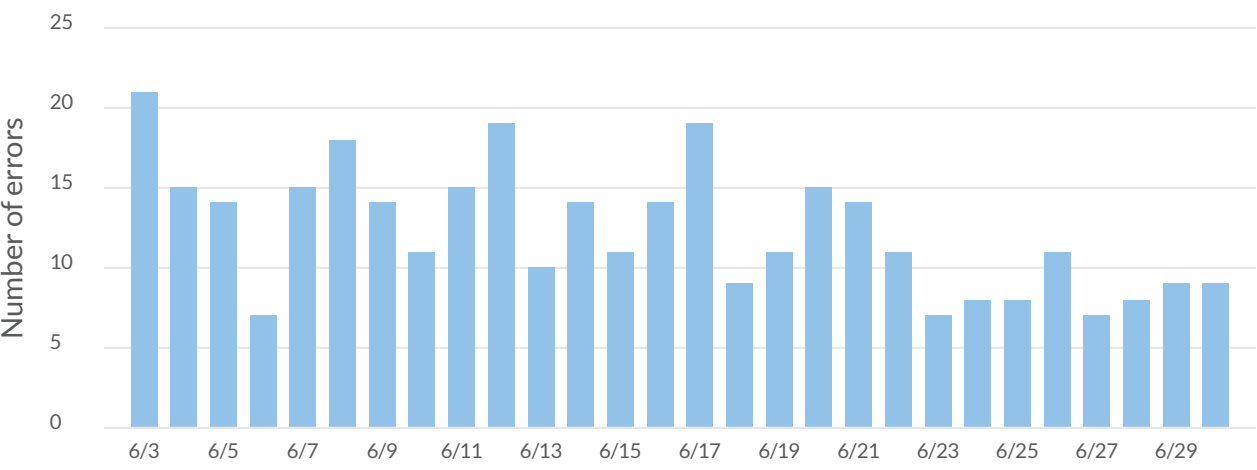
- Designate emergency medications, rescue agents and antidotes as permanent stock in the automated dispensing system (ADS) system to avoid accidental elimination from inventory.
- Removed unfractionated heparin vials containing more than 10,000 units.
- Balance the need for ADS alerts with the understanding of alert fatigue and the ability to have many of these messages directly on the medication administration record.

Reducing medication errors

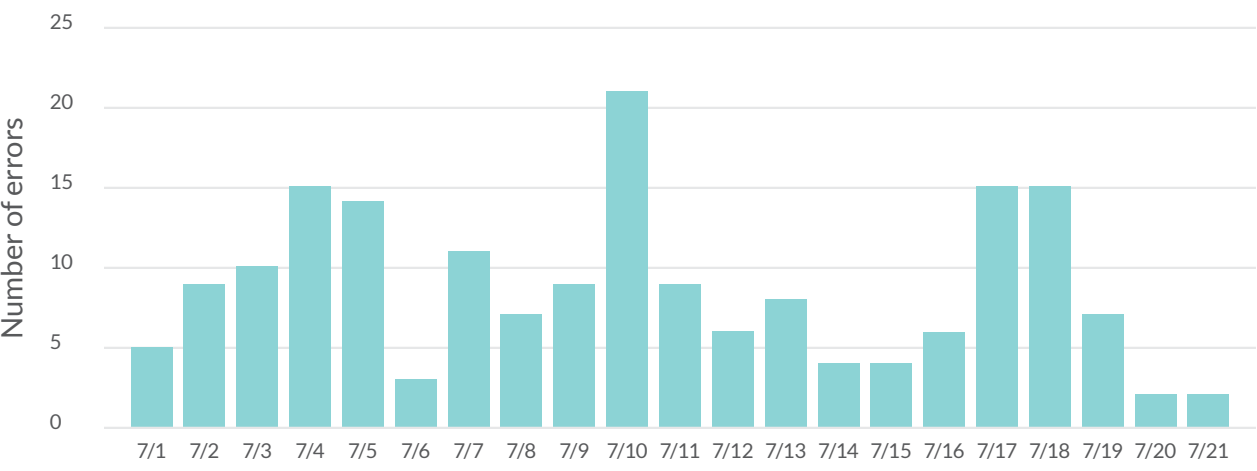
Medication errors may occur at any point in the medication administration process, and stocking medications in automated dispensing cabinets is no exception. Ensuring correct medication avoids medication errors at the bedside, preserves patient safety and allows for more efficient patient care by all members of the care team. Observed as a potential target to reduce medication errors, the goal was to reduce the number of medications mis-picked or missed during the daily Omnicell restocks. Currently the restock is pulled twice a day by technicians and the medications pulled are double-checked by a senior technician or pharmacy student. During the quality improvement period, a form was sent with the technicians to the automated dispensing cabinets to document any issues with medications during restock.

Across the system, the most common errors occurring during restock were having an incorrect item pulled or the needed item not being part of the restock supplies. When an incorrect item was identified as being pulled, an email was sent to staff with pictures of the wrong item and the correct item. The project took place throughout June and July, and resulted in a drastic reduction in medications pulled in error for restock. At the end of July, the incidence of incorrect medication being pulled was reduced by nearly 30%, associating this awareness campaign with a favorable reduction and justification for continued analysis.

Restock study – June 2024



Restock study – July 2024

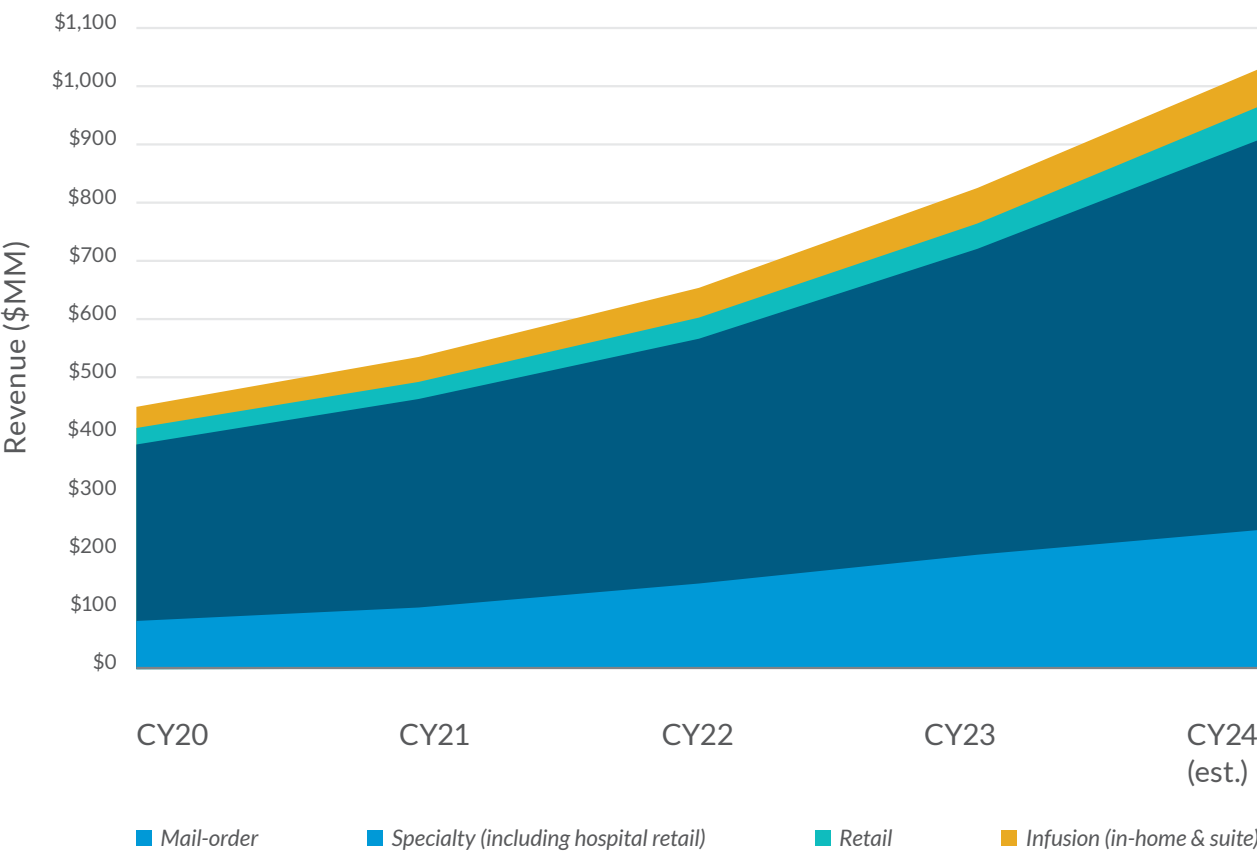


Strategy & innovation



Channel growth

Geisinger Pharmacy has maintained strong financial performance and growth trajectory over the past year, with non-traditional integrated delivery network (IDN) pharmacy assets estimated to grow 24% to an annual revenue of \$1 billion+. Supported through a combination of strategic planning, innovation and operational excellence, Geisinger Pharmacy channels have maintained 18% compounded annual growth rate (CAGR) over the past 5 years.



Strategic growth levers specific to each distribution channel during 2024 include:

Retail

- Enhanced prescription capture through Acute Rx Fast Pass program implementation
- Vaccine program growth via increased appointment access and clinic stock replenishment model
- Prescription volume growth for LIFE program enabled by Rx compliance packaging service offering
- Geographic expansion of retail network with opening of Reedsville location
- Calendar year 2023 (CY23) estimated revenues of \$57 million with 30% annual growth rate

Mail-order

- Streamlined dispensing operations with conversion to Epic Willow Ambulatory (WAMB) system
- Multi-phased production line expansion to nearly double daily prescription throughput capacity
- Staffing optimization with improved recruitment due to transition to hybrid work-from-home model
- Enhanced patient experience enabled by optimized call service levels and Rx turnaround times
- CY24 revenues estimated at \$237 million with 21% annual growth rate

Specialty (includes hospital retail)

- Growth of satellite specialty pharmacy dispense model across entity-owned pharmacies
- Facility expansion and automation of dispensing operations with move to Northeast Pharmacy hub
- Integration of Specialty Pharmacy and Medication Therapy Disease Management (MTDM) platforms
- Third party payer specialty network expansion efforts for top commercial payers
- CY23 revenues estimated at \$668 million with 27% annual growth rate

Infusion (in-home and suite)

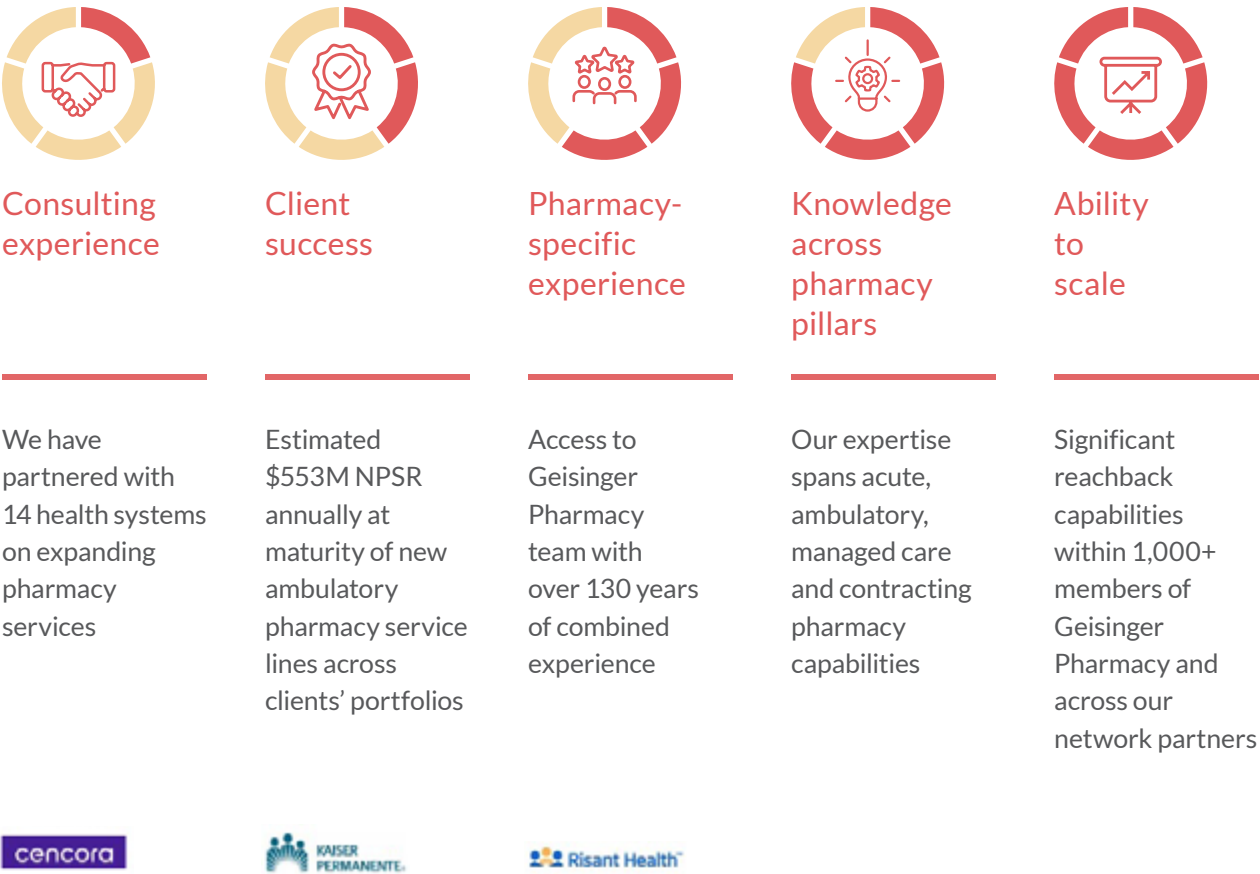
- Geographic expansion with opening of infusion pharmacy and suite at Northeast Pharmacy Hub
- Enhanced post-acute antibiotic script capture enabled by process redesign and competitive pricing
- Expansion of infusion services in Western Region via Windmere satellite pharmacy
- Growth of specialty infusion services in response to expanded payor site of care programs
- CY23 revenues estimated at \$62 million with 6% annual growth rate

In addition to the channel-specific strategies noted above, integration of the MTDM and Central Medication Hub (CMH) platforms across dispensing operations continues to drive financial growth. By hard-wiring value-based strategies within care coordination and dispensing workflows, the MTDM and CMH teams ensure optimal medication and channel selection while also enhancing patient and provider experience.

Geisinger Pharmacy Solutions

Geisinger Pharmacy Solution (GPS), the consulting arm for Geisinger Pharmacy, empowers clients to identify and assess the viability of strategic growth channel opportunities to meet their organizational goals (Figure 1).

Figure 1 – Why Geisinger Pharmacy Solutions?



In partnership with Cencora, the home infusion and pharmacy infusion suites strategy offering consists of two phases: the business plan and financial proforma (Phase 1), and program implementation with ongoing growth support (Phase 2). GPS works side by side with our health system clients as they prepare for opening net new pharmacy infusion services or expanding access with the addition of pharmacy infusion suites.

While infusion services is still a core to our service offering, GPS has expanded into additional pharmacy capability areas enabling Geisinger Pharmacy to share its award-winning best practices with a broader audience (Figure 2). Over the past year, GPS facilitated a path for health systems to:

- Enable specialty pharmacy services through acceleration to market
- Optimize hospital-based infusion center workflows and increase chair capacity
- Develop an FDA- and USP-compliant insourcing model for centralized compounding
- Centralize pharmacy resources and services through an enterprise pharmacy model
- Implement ambulatory pharmacy care models to reduce prescriber workload while enhancing internal pharmaceutical script capture

Figure 2 – Geisinger Pharmacy Solutions capabilities



Pharmacy Informatics and Technology

The Pharmacy Informatics and Technology team continues interprofessional collaborations with informaticians and clinicians to create and support ProvenCare and ProvenRecovery pathways in the electronic health record. These pathways are in place to ensure all patients receive standardized, best practice of care across the care delivery network. Beyond creating and maintaining these pathways, the Pharmacy Informatics and Technology team reviews to audit pathway-related data, compliance and trends to ensure patient care is safe, effective and consistent across the system.

In the ambulatory care space, the Pharmacy Informatics and Technology team enacts many of the same pathways to guide and monitor care provided in the outpatient settings. Besides its clinical partners, the team has been working with Revenue Management to ensure all medication administrations are captured to prevent financial losses in the system, thereby impacting resources available for patients. Through the time of this report in 2024, the Pharmacy Informatics and Technology team has identified over \$2 million in pharmacy-based charges that were missed in the medication administration process.



Board certified pharmacists



Board Certified Ambulatory Care Pharmacist (BCACP)

Brian W. Bedwick	Kayla E. Kline	Amanda M. Popko
Kimberly Carozzoni	Samantha L. Kunkel	Ivan Puskovic
Sarah Dombrowski	Christopher M. LaFratte	Colleen M. Strouse
Christopher R. Evans	Rachel Rose Lazevnick	Julia Swigart
Catherine M. Haupt	Daniel S. Longyhore	James M. Taleroski
Jennifer C. Heikkinen	Elena K. Marines	Theron M. Ward
Michael A. Kachmarsky	Scott T. Opalka	Ariana R. Wendoloski
Michael Kessock	Lauren E. Pheasant	Krista Wetzel

Board Certified Critical Care Pharmacist (BCCCP)

Anthony D. Alu	Kristen M. Franklin	David Seitzinger
Anna Baughman, PharmD	Jamie L. Kerestes	Laurie Sherrick
Amy L. Brokenshire	Kayla Kotch	Angela A. Slampak-Cindric
Allison K. Cebulko	Kimberley H. Limouze	
Darlene Chaykosky	Lindsey M. Schneider	

Board Certified Cardiology Pharmacist (BCCP)

Amy L. Brokenshire	Liam Callejas	Samuel P. Eckel
--------------------	---------------	-----------------

Board Certified Emergency Medicine Pharmacist (BCEMP)

Ryan T. Burkhardt	Jamie L. Kerestes
-------------------	-------------------

Board Certified Geriatrics Pharmacist (BCGP)

Kimberly Carozzoni

Board Certified Pediatric Pharmacy Specialist (BCPPS)

Susan Butler

Board Certified Infectious Disease Pharmacist (BCIDP)

Caroline Dillon	Benjamin P. Heikkinen	Marisa Perrella
Maria Heaney	Bradley E. Lauver	Ricky M. Rampulla Jr.

Board Certified Nutrition Support Pharmacist (BCNSP)

Mariya Monfette

Board Certified Oncology Pharmacist (BCOP)

Benjamin J. Andrick	Gwen Hua	Rachel Sneidman
Leslie Anforth	Tristan A. Maiers	Jacqueline R. Starr
Jei Won H. Eckel	Anupama D. Mathur	Rachael Straining
Kayla M. Hart	Anna K. McDermott	

Board Certified Pediatric Pharmacy Specialist (BCPPS)

Susan Butler	Joan M. Keehan	Bryan E. Snook
Shannon B. Draus	Michelle A. Ligotski	Leslie Taleroski
Sarah F. Hale	Kimberly L. Nissen	Emma L. Wysocki

Board Certified Pharmacotherapy Specialist (BCPS)

Kelly M. Bolesta	Katelin A. Ivey	Melissa L. Olsommer
Amanda E. Boyer	Sarah M. Jallen	Nicholas Preston
Amy L. Brokenshire	Arthur M. Jankowski	Ivan Puskovic
Michelle L. Budzyn	Danielle A. Karaffa	Ricky M. Rampulla Jr.
Ryan T. Burkhardt	Joan M. Keehan	Brandon S. Rinehimer
Darlene Chaykosky	Elane H. Kleyn	William J. Samselski
Cara M. Ciamacco	Sarah Knauer	Melissa Sartori
Stephanie Cybulski	Eric D. Kowalek	Rachel A. Seidel
Keturah DelGrosso	Danielle E. Kuhn	Krushna Shah
Caroline Dillon	Bradley E. Lauver	Amanda Sharry-Rogers
Bradley D. Dudeck	Staley Lawes	Sarah A. Siemion
Sydney Estock	Frederick R. Leri	Angela A. Slampak-Cindric
Alyssa Falkowski	Kimberley H. Limouze	Sarah K. Tanner
Sawyer Foyle	Sara H. Maiers	Troy N. Tanner
Sara L. Gaines	Vanessa A. Markle	Rachel Taylor
Dante M. Grassi	Eryn Milius	Sally A. Tice
Kelly S. Guza	Jordan R. Moore	

Board Certified Sterile Compounding Pharmacist (BCSCP)

Heidi Yanoski

Certified Anticoagulation Care Provider (CACP)

Amy Brokenshire	Stacey Grassi	James Taleroski
-----------------	---------------	-----------------

Certified Diabetes Care and Education Specialist (CDCES)

Bernie Eck	Leeann Webster
------------	----------------

Awards and recognitions

Benjamin Andrick, PharmD, BCOP

40 Under 40 in Cancer: Rising Stars and Emerging Leaders recipient from Association of Value-Based Cancer Care (AVBCC)

New Practitioner Award, Hematology Oncology Pharmacy Association (HOPA)

Duncan Dobbins, PharmD

Health System Science Leadership Course, Geisinger Center for Faculty and Professional Development

Vanessa Hayduk, BS, PMP

CLiMB Program 2024, Geisinger

Sean Karp

CompTIA IT Operation Specialist – CIOS

CompTIA Secure Infrastructure Specialist – CSIS

CompTIA Network+

CompTIA Security+

ISC2 Certified in Cybersecurity

PA Responsible Alcohol Management Program Certification

Coursera Google Cybersecurity

Daniel Longyhore, PharmD, EdD, BCACP

Fellow, American College of Clinical Pharmacy

Alysha Lopez, PharmD, RPh

Ten Under Ten Award, Pennsylvania Pharmacist Association (PPA)

Angela Slampak-Cindric, PharmD, BCPS, BCCCP

Presidential Citation, Society of Critical Care Medicine

Fellow, Society of Critical Care Medicine's American College of Critical Care Medicine

Sally Tice, RPh, PharmD, MHA, BCPS

Abstract Committee, American Society of Parenteral and Enteral Nutrition (ASPEN)

Periop PRN Treasurer 2023–2024, American College of Clinical Pharmacy (ACCP)

Ryley Uber, PharmD

Excellence in Pharmacy Practice Leadership Award, Cedarville University

Publications, presentations and posters

Peer-reviewed articles

1. Acquisto NM, Mosier JM, Bittner EA, Patanwala AE, Hirsch KG, Hargwood P, Oropello JM, Bodkin RP, Groth CM, Kaucher KA, **Slampak-Cindric AA**, Manno EM, Mayer SA, Peterson LN, Fulmer J, Galton C, Bleck TP, Chase K, Heffner AC, Gunnerson KJ, Boling B, Murray MJ. Society of Critical Care Medicine Clinical Practice Guidelines for Rapid Sequence Intubation in the Critically Ill Adult Patient. *Crit Care Med*. 2023 Oct 1;51(10):1411-1430. doi: 10.1097/CCM.0000000000006000. Epub 2023 Sep 14. PMID: 37707379.
2. Acquisto NM, Mosier JM, Bittner EA, Patanwala AE, Hirsch KG, Hargwood P, Oropello JM, Bodkin RP, Groth CM, Kaucher KA, **Slampak-Cindric AA**, Manno EM, Mayer SA, Peterson LN, Fulmer J, Galton C, Bleck TP, Chase K, Heffner AC, Gunnerson KJ, Boling B, Murray MJ. Society of Critical Care Medicine Clinical Practice Guidelines for Rapid Sequence Intubation in the Critically Ill Adult Patient: Executive Summary. *Crit Care Med*. 2023 Oct 1;51(10):1407-1410. doi: 10.1097/CCM.0000000000005999. Epub 2023 Sep 14. PMID: 37707378.
3. Aguilar AG, Beauregard BA, Conroy CP, Khatiwoda YT, Horsford SME, Nichols SD, **Piper BJ**. Pronounced Regional Variation in Esketamine and Ketamine Prescribing to US Medicaid Patients. *J Psychoactive Drugs*. 2024 Jan-Mar;56(1):33-39. doi: 10.1080/02791072.2023.2178558. Epub 2023 Mar 1. PMID: 36857284; PMCID: PMC10471778.
4. Aguilar AG, Canals PC, Tian M, Miller KA, **Piper BJ**. Decreases and Pronounced Geographic Variability in Antibiotic Prescribing in Medicaid. *Pharmacy (Basel)*. 2024 Mar 1;12(2):46. doi: 10.3390/pharmacy12020046. PMID: 38525726; PMCID: PMC10961814.
5. Alexander GD, Cavanah LR, Goldhirsh JL, Huey LY, **Piper BJ**. Medical Cannabis Legalization: No Contribution to Rising Stimulant Rates in the USA. *Pharmacopsychiatry*. 2023 Nov;56(6):214-218. doi: 10.1055/a-2152-7757. Epub 2023 Oct 26. PMID: 37884027.
6. Anderson KE, Gifeisman RI, Basting JL, Harris DJ, Rajan AR, McCall KL, **Piper BJ**. High Prescribing and State-Level Variation in Z-Drug Use Among Medicare Patients. *Pharmacopsychiatry*. 2023 Jul;56(4):149-153. doi: 10.1055/a-2085-2299. Epub 2023 Jun 7. PMID: 37285910.
7. Canals PC, Aguilar AG, Carter GT, Shields CM, Westerkamp A, D’Elia M, Aldrich J, Moore RN, Moore AT, **Piper BJ**. Patient Reported Outcomes Using Medical Cannabis for Managing Pain in Charcot-Marie-Tooth Disease. *Am J Hosp Palliat Care*. 2023 Nov;40(11):1163-1167. doi: 10.1177/10499091231158388. Epub 2023 Feb 15. PMID: 36793224.
8. Chastain DB, **Curtis J**, Tang E, Young HN, Ladak AF. ART-related medication errors in hospitalized people with HIV in the INSTI-era: analysis from 2 health systems in South Georgia, U.S. *AIDS Care*. 2024 Jun;36(6):832-839. doi: 10.1080/09540121.2023.2248564. Epub 2023 Aug 24. PMID: 37614179.
9. Dana SR, Nichols SD, McCall KL, **Piper BJ**. Pronounced State Level Disparities in Medicaid Prescribing of Buprenorphine for Opioid Use Disorder (2019-2020). *J Stud Alcohol Drugs*. 2024 Jan;85(1):19-25. doi: 10.15288/jsad.22-00373. Epub 2023 Aug 30. PMID: 37650858.

10. Davis LC, Diianni AT, Drumheller SR, Elansary NN, D'Ambrozio GN, Herrawi F, **Piper BJ**, Cosgrove L. Undisclosed financial conflicts of interest in DSM-5-TR: cross sectional analysis. *BMJ*. 2024 Jan 10;384:e076902. doi: 10.1136/bmj-2023-076902. PMID: 38199616; PMCID: PMC10777894.

11. **Graham J**, Voyce SJ, Hayden JR, **Chopra A**, Tinsley J, Singh N, Eslami A, **Grassi S**, **Zook A**, **Lauver B**, **Eckel S**, **Hayduk VA**, Kern MS, Agarwal S, **Wright EA**. Evaluation of pharmacist-led transition of care program in patients with acute coronary syndrome. *J Am Pharm Assoc (2003)*. 2024 May-Jun;64(3):102023. doi: 10.1016/j.japh.2024.01.019. PMID: 38309415.

12. Hardy CJ, Cochran G, Howey W, **Wright E**, Wasan AD, Gordon AJ, Kraemer KL. Impact of Provider-Facing Interventions to Reduce Opioid Use on Pain Related Outcomes in Primary Care: A Cluster Randomized Trial. *Health Serv Res Manag Epidemiol*. 2024 Apr 22;11:23333928241240957. doi: 10.1177/23333928241240957. eCollection 2024 Jan-Dec. PMID: 38655098; PMCID: PMC11036925.

13. Harmon J, Endy MC, Sulzinski MA, **Piper BJ**. Changes in COVID-19 Vaccine Hesitancy within Pennsylvania over the Course of the Pandemic. *The Guthrie Journal*. 2023 Oct;75(2):62-72. doi: 10.3138/guthrie-2023-0005.

14. Hirsch AG, **Wright EA**, Nordberg CM, DeWalle J, Stains EL, Kennalley AL, Zhang J, **Tusing LD**, **Piper BJ**. Dispensaries and Medical Marijuana Certifications and Indications: Unveiling the Geographic Connections in Pennsylvania, USA. *Med Cannabis Cannabinoids*. 2024 Feb 20;7(1):34-43. doi: 10.1159/000537841. eCollection 2024 Jan-Dec. PMID: 38487377; PMCID: PMC10939510.

15. Hsu ZS, Warnick JA, Harkins TR, Sylvester BE, Bharati NK, Eley LB, Nichols SD, McCall K, **Piper BJ**. An analysis of patterns of distribution of buprenorphine in the United States using ARCOS, Medicaid, and Medicare databases. *Pharmacol Res Perspect*. 2023 Aug;11(4):e01115. doi: 10.1002/prp2.1115. PMID: 37485957; PMCID: PMC10364307.

16. **Ivey KA**, **Bolesta S**. Impact of Pharmacist Monitoring of Serum Triglycerides for Critically Ill Patients Receiving Propofol. *J Pharm Pract*. 2024 Apr;37(2):318-323. doi: 10.1177/08971900221134646. Epub 2022 Oct 14. PMID: 36240532.

17. Johnson D, Del Fiol G, Kawamoto K, **Romagnoli KM**, Sanders N, Isaacson G, Jenkins E, Williams MS. Genetically guided precision medicine clinical decision support tools: a systematic review. *J Am Med Inform Assoc*. 2024 Apr 19;31(5):1183-1194. doi: 10.1093/jamia/ocae033. PMID: 38558013; PMCID: PMC11031215.

18. Jones LK, **Romagnoli KM**, Schubert TJ, Clegg K, Kirchner HL, Hu Y, Cawley D, Norelli V, Williams MS, Gidding SS, Rahm AK. Using implementation science to develop a familial hypercholesterolemia screening program in primary care: The CARE-FH study. *J Clin Lipidol*. 2024 Mar-Apr;18(2):e176-e188. doi: 10.1016/j.jacl.2024.01.001. Epub 2024 Jan 4. PMID: 38228467; PMCID: PMC11069448.

19. Kennalley AL, Fanelli JL, Furst JA, Mynarski NJ, Jarvis MA, Nichols SD, McCall KL, **Piper BJ**. Dynamic changes in methadone utilisation for opioid use disorder treatment: a retrospective observational study during the COVID-19 pandemic. *BMJ Open*. 2023 Nov 16;13(11):e074845. doi: 10.1136/bmjopen-2023-074845. PMID: 37973543; PMCID: PMC10661065.

20. Liu EY, McCall KL, **Piper BJ**. Pronounced State-Level Disparities in Prescription of Cannabinoids to Medicaid Patients. *Med Cannabis Cannabinoids*. 2023 Jun 19;6(1):58-65. doi: 10.1159/000531058. eCollection 2023 Jan-Dec. PMID: 37404688; PMCID: PMC10315157.

21. **Longyhore DS**, Woll N. Remuneration for clinical education: Understanding the costs and considerations. *JACCP*. 2024 May;7(5):414-415. doi: 10.1002/jac5.1952.

22. **Longyhore D**, **Wright E**, **Dombrowski SK**, **Andrick B**. Using a preceptor development series in writing and publication to improve residency research manuscripts. *Innov Pharm*. 2024;15(2). doi: 10.24926/iip.v15i2.5179.

23. Lopera SD, O’Kane VM, Goldhirsh JL, **Piper BJ**. Regional Disparities in Prescription Methamphetamine and Amphetamine Distribution Across the United States. *J Atten Disord*. 2023 Oct;27(12):1322-1331. doi: 10.1177/10870547231177467. Epub 2023 Jun 8. PMID: 37288726.

24. Lussier ME, Desai RJ, **Wright EA**, Gionfriddo MR. Impact of cost on prescribing diabetes medications for older adults with type 2 diabetes in the outpatient setting. *Res Social Adm Pharm*. 2024 Aug;20(8):755-759. doi: 10.1016/j.sapharm.2024.04.013. Epub 2024 Apr 26. PMID: 38697890.

25. Lussier ME, Gionfriddo MR, **Graham JH**, **Wright EA**. Factors Affecting Prescribing of Type 2 Diabetes Medications in Older Adults within an Integrated Healthcare System. *J Gen Intern Med*. 2024 Feb;39(2):195-200. doi: 10.1007/s11606-023-08435-6. Epub 2023 Oct 2. PMID: 37783983; PMCID: PMC10853133.

26. Madera JD, Ruffino AE, Feliz A, McCall KL, Davis CS, **Piper BJ**. Declining but Pronounced State-Level Disparities in Prescription Opioid Distribution in the United States. *Pharmacy (Basel)*. 2024 Jan 16;12(1):14. doi: 10.3390/pharmacy12010014. PMID: 38251408; PMCID: PMC10801547.

27. Manko CD, Ahmed MS, Harrison LR, Kodavatiganti SA, Lugo N, Konadu JO, Khan F, Massari CA, Sealey TK, Addison ME, Mbah CN, McCall KL, Fraiman JB, **Piper BJ**. Retrospective study investigating naloxone prescribing and cost in US Medicaid and Medicare patients. *BMJ Open*. 2024 May 1;14(5):e078592. doi: 10.1136/bmjopen-2023-078592. PMID: 38692729; PMCID: PMC11086430.

28. 2Manko CD, Apple BJ, Chang AR, **Romagnoli KM**, Johannes BL. Telemedicine in Advanced Kidney Disease and Kidney Transplant: A Qualitative Meta-Analysis of Studies of Patient Perspectives. *Kidney Med*. 2024 May 24;6(7):100849. doi: 10.1016/j.xkme.2024.100849. eCollection 2024 Jul. PMID: 39040545; PMCID: PMC11261003.

29. McCall KL, Doughty BJ, **Piper BJ**, Naik H, Bange S, Leppien EE. First generation antipsychotic-associated serious adverse events in women: a retrospective analysis of a pharmacovigilance database. *Int J Clin Pharm*. 2024 Apr;46(2):515-521. doi: 10.1007/s11096-023-01693-8. Epub 2024 Feb 5. PMID: 38315306.

30. **Montross M**, **Douthit S**, **Learn L**, **Dombrowski SK**, Hanna C, Gruver B. Impact of interdisciplinary case management and pharmacist transitions of care interventions on 30-day readmissions. *Res Social Adm Pharm*. Aug 2023;19(8)1214-1217. doi: 10.1016/j.sapharm.2023.05.004. Epub 2023 May 10. PMID: 37198058.

81

82

31. Olson AW, Haapala JL, Hooker SA, Solberg LI, Borgert-Spaniol CM, **Romagnoli KM**, Allen CI, **Tusing LD**, **Wright EA**, Haller IV, Rossom RC. The potential impact of clinical decision support on nonwaivered primary care clinicians’ prescribing of buprenorphine. *Health Aff Sch*. 2023 Oct 11;1(4):qxad051. doi: 10.1093/haschl/qxad051. eCollection 2023 Oct. PMID: 38756745; PMCID: PMC10986287.

32. Pande LJ, Arnet RE, **Piper BJ**. An Examination of the Complex Pharmacological Properties of the Non-Selective Opioid Modulator Buprenorphine. *Pharmaceuticals (Basel)*. 2023 Oct 2;16(10):1397. doi: 10.3390/ph16101397. PMID: 37895868; PMCID: PMC10610465.

33. **Pheasant L**. Baricitinib (Olumiant) for the Treatment of Alopecia Areata. *Am Fam Physician*. 2023 Nov;108(5):513-514. PMID: 37983706.

34. **Piper BJ**, Tian M, Saini P, Higazy A, Graham J, Carbe CJ, Bordonaro M. Immunotherapy and Cannabis: A Harmful Drug Interaction or Reefer Madness?. *Cancers (Basel)*. 2024 Mar 22;16(7):1245. doi: 10.3390/cancers16071245. PMID: 38610922; PMCID: PMC11011043.

35. Prasad S, Mathew PS, **Piper BJ**, Kaur K, Tian M. The Neurobiology of Methamphetamine Addiction and the Potential to Reduce Misuse Through Conjugate Vaccines Targeting Toll-Like Receptor 4. *Cureus*. 2023 Jun 11;15(6):e40259. doi: 10.7759/cureus.40259. eCollection 2023 Jun. PMID: 37440809; PMCID: PMC10335775.

36. Rodriguez LA, Finertie H, Neugebauer RS, Gosiker B, Thomas TW, Karter AJ, Gilliam LK, Oshiro C, An J, Simonson G, Cassidy-Bushrow AE, **Dombrowski S**, Nolan M, O’Connor PJ, Schmitttdiel JA. Race and ethnicity and pharmacy dispensing of SGLT2 inhibitors and GLP-1 receptor agonists in type 2 diabetes. *Lancet Reg Health Am*. 2024 May 7;34:100759. doi: 10.1016/j.lana.2024.100759. eCollection 2024 Jun. PMID: 38745886; PMCID: PMC11091531.

37. **Romagnoli KM**, Salvati ZM, Johnson DK, Ramey HM, Chang AR, Williams MS. Genomics in nephrology: identifying informatics opportunities to improve diagnosis of genetic kidney disorders using a human-centered design approach. *J Am Med Inform Assoc*. 2024 May 20;31(6):1247-1257. doi: 10.1093/jamia/ocae053. PMID: 38497946; PMCID: PMC11105128.

38. Salava K, Patel R, Newman E, Nicholas PD, **Grassi DM**, **Thomas S**, **Chronowski J**, Pugliese D, Cote J. Improving Safety in Rheumatology Patients by Closing Pre-screening Laboratory Care Gaps with Rheumatologist-Pharmacist Co-management. *Medical Research Archives*. 2023 Sep;11(9). doi: 10.18103/mra.v11i9.4329. Available at: <https://esmed.org/MRA/mra/article/view/4329>

39. Sengupta T, Soni T, Bolock AM, Heisey SA, Kuchinski EC, **Piper BJ**, Joyce JM, Carbe CJ. Knowledge, Attitudes, and Beliefs of Medical Students Toward Transgender Healthcare: A Community-Driven Initiative. *Cureus*. 2023 Dec 5;15(12):e49992. doi: 10.7759/cureus.49992. eCollection 2023 Dec. PMID: 38058529; PMCID: PMC10697781.

40. Solgama JP, Liu E, Davis M, **Graham J**, McCall KL, **Piper BJ**. State-level variation in distribution of oxycodone and opioid-related deaths from 2000 to 2021: an ecological study of ARCOS and CDC WONDER data in the USA. *BMJ Open*. 2024 Mar 7;14(3):e073765. doi: 10.1136/bmjopen-2023-073765. PMID: 38453203; PMCID: PMC10921485.

41. Sperber NR, Roberts MC, Gonzales S, Bendz LM, Cragun D, Haga SB, Wu RR, Omeogu C, Kaufman B, Petry NJ, Ramsey LB, **Uber R**. Pharmacogenetic testing in primary care could bolster depression treatment: A value proposition. *Clin Transl Sci*. 2024 Jun;17(6):e13837. doi:10.1111/cts.13837. PMID: 38898561; PMCID: PMC11186746.

42. Stains EL, Patel AC, Solgama JP, Hagedorn JD, McCall KL, **Piper BJ**. Dynamic Changes in the Distribution of Hydrocodone and Oxycodone in Florida from 2006-2021. *Pharmacy (Basel)*. 2024 June 28;12(4):102. doi: 10.3390/pharmacy12040102. PMID: 39051386.

43. **Uber R**, Hayduk VA, Pradhan A, Ward T, Flango A, Graham J, Wright EA. Pre-emptive pharmacogenomics implementation among polypharmacy patients 65 years old and older: a clinical pilot. *Pharmacogenomics*. 2023 Dec;24(18):915-920. doi: 10.2217/pgs-2023-0185. Epub 2023 Nov 15. PMID: 37965783.

44. Williams BA, Rajpura J, Paprocki YM, Kumar N, Voyce S, **Brady JP**, Chang A. Temporal trends in cardiovascular outcomes and costs among patients with type 2 diabetes. *Am Heart J*. 2023 Nov;265:161-169. doi: 10.1016/j.ahj.2023.07.012. Epub 2023 Jul 27. PMID: 37516264.

Non-peer reviewed articles

1. **Zally D**, **Malatesta A**. A Primer on Revenue Cycle Basics for the Practicing Hematology/Oncology Pharmacist. *HOPA News: Pharmacists Optimizing Cancer Care*, 2023;20(3),13-16. Available at: hoparx.org/documents/192/HOPANews_Vol20_Issue3-v9-4web_FINAL.pdf

Published abstracts

1. **Budzyn M**, Myers Z, **Slampak Cindric A**, Bowser Z, Lopez R. 1596: A Weight-based Enoxaparin Protocol for Venous Thromboembolism Prophylaxis in Trauma Patients. *Critical Care Medicine*. 52(1):p S769, January 2024. doi: 10.1097/01.ccm.0001004540.79778.94.

2. **Butler SM**, Nissen K, **Draus S**, **Snook B**. Improving Antimicrobial Delivery for Pediatric Patients in ED: Focus on Pharmacy Workflow. *Pediatr Qual Saf*. 2024 Feb 19;9(Suppl):e702. doi: 10.1097/pq9.0000000000000702. PMCID: PMC10896174.

3. **Pradhan AM**, **Shetty VA**, **Gregor CM**, **Chopra AA**, **Tusing L**, Hirsch AG, Hall E, Troiani V, Davis MP, Beiler DL, **Romagnoli KM**, Kraus CK, **Piper BJ**, **Graham JG**, **Wright EA**. Marijuana Use Documentation within Electronic Health Records (EHRs) at an Integrated Delivery Network (IDN): A Cross-Sectional Study. Abstracts from the 2024 Health Care Systems Research Network (HCSRN) annual conference, Milwaukee, Wisconsin. *J Patient Cent Res Rev*. 2024;11:118-80. doi: 10.17294/2330-0698.2105.

4. **Shetty VA, Gregor CM, Tusing L, Pradhan AM, Romagnoli KM, Piper BJ, Wright EA.** A Content Analysis of Marijuana-Related Discussions Through Patient Portal Messages. Abstracts from the 2024 Health Care Systems Research Network (HCSRN) annual conference, Milwaukee, Wisconsin. *J Patient Cent Res Rev.* 2024;11:118-80. doi: 10.17294/2330-0698.2105.

5. **Romagnoli KM,** Beiler DL, **Piper BJ, Pradhan AM,** Troiani V, **Tusing L, Gregor CM, Wright EA.** What Do We Know About Our Patients’ Cannabis Use? A Mixed-Methods Approach. Abstracts from the 2024 Health Care Systems Research Network (HCSRN) annual conference, Milwaukee, Wisconsin. *J Patient Cent Res Rev.* 2024;11:118-80. doi: 10.17294/2330-0698.2105.

6. Troiani V, Beiler DL, **Gregor CM,** Soares J, **Chopra AA, Tusing L, Piper BJ, Romagnoli KM, Pradhan AM,** Kraus CK, **Wright EA.** A Novel REDCap Instrument for the Extraction and Analysis of Marijuana Use from EHR data. Abstracts from the 2024 Health Care Systems Research Network (HCSRN) annual conference, Milwaukee, Wisconsin. *J Patient Cent Res Rev.* 2024;11:118-80. doi: 10.17294/2330-0698.2105.

7. **Weaver K, Heikkinen B, Novak M.** Real-world Comparative Effectiveness and Safety of Intravenous to Oral Sotalol Loading Among Patients with Atrial Arrhythmias. *JACC.* 2024 Apr 2;83(13_Supplement):8. doi: 10.1016/S0735-1097(24)01998-3.

Invited presentations

1. **Aftewicz H, Learn L, Longyhore D,** Tucker S. Outcomes of a pharmacist led comprehensive medication review program within an integrated care delivery network. American Society of Health System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

2. **Burkhardt R, Hendershot T, Schmucker D.** No Fibbing: Updates in the Management of Atrial Fibrillation. Geisinger Fresh Pharm...A Medication Update, Danville, PA, April 2024.

3. **Dobbins DX,** Bachhuber MA, **Piper BJ, Wright EA.** Dollars, Drugs and Decision Makers: Pharmaceutical Company Payments to Preferred Drug List Selection Committees. American College of Clinical Pharmacy (ACCP) Health Outcomes PRN Webinar, Virtual, June 2024.

4. **Dobbins DX,** Bachhuber MA, **Piper BJ, Wright EA.** Money, Medicine, and Medicaid: Pharmaceutical Company Payments to Preferred Drug List Selection Committees. Health Care Systems Research Network (HCSRN) Annual Conference, Milwaukee, WI, April 2024.

5. **Dombrowski SK,** Knorr M, **Mascaritola K.** Innovative Approaches for Medication Safety and Adherence in Patients 65 and Older. Geisinger 14th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, PA, March 2024.

6. **Dombrowski SK,** Knorr M, **Mascaritola K.** Innovative Approaches for Medication Safety and Adherence in Patients 65 and Older. Pennsylvania Pharmacists Association (PPA) Webinar, Virtual, August 2024.

7. **Flango AF, Dombrowski S.** Models of Care at Geisinger. UPMC St. Margaret Hospital Geriatric Core Curriculum, Virtual, May 2024.

8. **Fox MJ.** Diversifying How We Think: Practical Approaches for Incorporating Diversity, Equity, and inclusion into Residency Training. Eastern States Residency Conference, Hershey, PA, May 2024.

9. **Gaines S.** HCV Serodiscordant Transplants: Bridging Guidelines and Reality. American Society of Health-System Pharmacists (ASHP) Pharmacy Futures 2024, Portland, OR, June 2024.

10. **Grassi S.** Geisinger’s Medication Therapy Disease Management Program: Positively Impacting Patients with Chronic Disease. Pennsylvania Society of Health-System Pharmacists (PSHP) 2023 Annual Assembly, Valley Forge, PA, September 2023.

11. **Grassi S.** Health System and Payer Perspective – How large health systems have approached and implemented anticoagulation stewardship programs. Anticoagulation Forum: Anticoagulation Stewardship Summit, Washington DC, June 2024.

12. **Heikkinen B, Lopez A.** Synergistic Pharmacy Operations for Home Infusion Antibiotics. Pennsylvania Pharmacist Association (PPA) Annual Conference, Harrisburg, PA, February 2024.

13. **Hendershot T, Warunek L, Fox MJ, Markle V, Schneider L.** Rate of Urinary Tract Infections in Patients Taking Sodium-Glucose Cotransport Inhibitors with Acute Abnormalities of the Genitourinary Tract. Eastern States Residency Conference, Hershey, PA, May 2024.

14. **Knauss G, Learn L, Kerestes J.** Impact of Centralized Clinical Pharmacy Services Urine Culture Review Following Emergency Department Discharge. American Society of Health System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

15. **Lehman A, Slampak-Cindric A.** Silent Threats: Paralytics, Pressors, and Potential Poisons. Geisinger Fresh Pharm... A Medication Therapy Update, Danville, PA, April 2024.

16. **Mascaritola K, Ward T, Krahe Dombrowski S, Swigart J.** Effect on Total Insulin Dose in People Receiving Novel Antidiabetic Agents for Type 2 Diabetes. Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, PA, May 2024.

17. **Mitsko S,** Narins A, **Rinkevich M.** What’s New? Updates on Vaccine Safety. Geisinger 14th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, PA, March 2024.

18. **Phang K.** Caregiver Liquid Ibuprofen Dosing Errors in the Outpatient Setting. Pediatric Academic Society, Toronto, Canada, May 2024.

19. **Pheasant L.** Prior Authorization and Updates in the Logistics of Prescribing Biologics as an Embedded Departmental Pharmacist. Pennsylvania Academy of Dermatology and Dermatologic Surgery (PAD) 55th Annual Scientific Meeting, Hershey, PA, September 2023.

20. **Piper BJ.** Medical Marijuana in Pennsylvania: Evidence and Perspectives of Health Care Providers. Pennsylvania Pain and Addiction Summit, Wilkes-Barre, PA, April 2024.

21. **Pradhan A**, Park S, **Anderson H**, **Hayduk V**, **Berhane J**, Sponenberg M, **Webster L**, **Graham J**, **Friedenberg S**, **Wright E**. Impact of a Multi-Faceted Best Practice Alert among Patients with Headaches seen in Primary Care. Health Care Systems Research Network (HCSRN) Scientific Data Resources Forum, Virtual, September 2023.

22. **Romagnoli KM**, Beiler D, **Pradhan A**, Troiani V, **Tusing L**, **Gregor C**, **Wright EA**. What do we know about our patients’ cannabis use? A mixed-methods approach. Health Care Systems Research Network (HCSRN) Annual Conference, Milwaukee, WI, April 2024.

23. **Schmucker D**. A one pill can kill list addition: concern of benzonatate toxicity. PharmERgency: Academic Emergency Medicine Pharmacists (AEMP) Conference, Philadelphia, PA, May 2024.

24. **Schmucker D**, **Kerestes J**, **Limouze K**, **Estock S**, Willner K. Predictors of Rate Control Failure in Emergency Department Patients with Atrial Fibrillation and Rapid Ventricular Response. Pennsylvania College of Emergency Physicians (PACEP) Scientific Assembly, Phoenix, AZ, May 2024.

25. **Schmucker D**, **Kotch K**, **Budzyn M**. Hospital Acquired Venous Thromboembolism in the Geisinger Community Medical Center Trauma Population. American Society of Health-System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

26. **Slampak-Cindric A**. Bashing BRASH: Breaking the Vicious Cycle. American Society of Health-System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

27. **Slampak-Cindric A**. Simple Acts of Inclusion. Practice Advancement Begins with You. American Society of Health-System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

28. **Uber R**. An Introduction to Pharmacogenomics at Geisinger: MyCode and Beyond. MyCode Genomic Screening & Counseling (GSC) Case Conference, Virtual, June 2024.

29. **Uber R**. Exploring the DNA of Pharmacy Leadership, Cedarville University’s Phi Lambda Sigma Chapter, Virtual, March 2024.

30. **Webster L**. Lowering Barriers to Medication Treatment for People with Opioid Use Disorder. 7th Annual National Opioid Crisis Management Congress, Tempe, AZ, January 2024.

31. **Webster L**. Reducing Barriers to Pain Management and Behavioral Health Using a TeleHealth Model to Improve Patient Access to Care. 7th Annual National Opioid Crisis Management Congress, Tempe, AZ, January 2024.

32. **Wright E**, **Pradhan AM**, Yan SX, Jones JB, Buss K. System-Based Strategies to Optimize Guideline-Directed Medical Therapy in Patients Living with Heart. Health Care Systems Research Network (HCSRN) Annual Conference, Milwaukee, WI, April 2024.

Internal seminars

1. **Andrick B**. Getting Published: A Clinicians DIY Guide. Pharmacy Grand Rounds, Virtual, April 2024.

2. **Andrick B**, **Straining R**, **Hua G**. Chimeric Antigen Receptor T-Cell (CAR-T) Therapy: A Pharmacy Primer. Pharmacy Grand Rounds, Virtual, July 2023.

3. **Clark K**, **Zally D**, **Grassi D**, **Hunsinger K**, **Howay J**, **Paisley A**. Biosimilar Review and Use Across and Integrated Care Delivery Network. Pharmacy Grand Rounds, Virtual, September 2023.

4. **Dobbins DX**. Dollars, Drugs and Decision Makers: Pharmacy Benefit Mangers: Allies or Adversaries of Drug Pricing?. Geisinger Commonwealth School of Medicine ShareTalk Series, Virtual, March 2024.

5. **Dobbins DX**, Pallis M, Poler SM. Cutting Costs, Not Corners: Addressing Scheduling & Referral Inefficiencies in Orthopedic Clinic. Geisinger Educational Scholarship Symposium, Danville, PA, May 2024.

6. **Evans M**, **Greskovic G**. Fireside Chat with Chief Pharmacy Officer and Assistant Vice President of Pharmacy Ambulatory Services. Pharmacy Grand Rounds, Virtual, January 2024.

7. **Ifeji C**, **Mascaritola K**, Warner T. 2024 ADA Standards of Care in Diabetes: Medication Therapy Update. Geisinger Diabetes Educator Meeting, Virtual, March 2024.

8. Maloney G, **Guza K**, Sheridan CA, Lamphear P. First, Do No Harm- The Anatomy of a Medical Error: Undetected Automatic Stop of Antibiotic. Pharmacy Grand Rounds, Virtual, March 2024.

9. **Pradhan A**. Navigating Qualitative Research: Methodologies, Case Studies, and Emerging Trends. Pharmacy Grand Rounds, June 2024.

10. **Proctor L**. Diabetic Ketoacidosis (DKA) Review and Management Updates. Advanced Practice Nursing Continuing Education Conference, Danville PA, October 2023.

11. **Rippon K**, **Kotch K**, **Leri F**, **Zook A**, **Desai R**. Patient Experience as Part of Patient Care: A Potentially Overlooked Aspect of Pharmacy Practice. Pharmacy Grand Rounds, Virtual, August 2023.

12. **Varela Gonzalez N**, **Lauver B**. AI: The New Prescription for Healthcare Excellence. Pharmacy Grand Rounds, Virtual, May 2024.

Poster presentations

1. **Alaparthi J, Longyhore D.** Characteristics of Krames on FHIR Usage within Geisinger. Susquehanna Valley Undergraduate Research Symposium, Lewisburg, PA, July 2023.

2. **Butler S, Draus S.** Assessment of Neonatal Sepsis Order Set Usage and Appropriateness of Nafcillin Dosing for Late Onset Sepsis/Meningitis in the NICU. Geisinger 14th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, PA, March 2024.

3. Chambers CL, Shaffern CL, **Chopra AA, Pradhan AM, Gregor CM, Tusing LD, Piper BJ, Wright EA, Romagnoli KM.** The Majority of Clinicians Find it Important to Have Marijuana Use Information but Fifty Percent Rarely Document. Geisinger Commonwealth School of Medicine Summer Research Immersion Program, Scranton, PA, July 2023.

4. **Dobbins DX,** Pallis M, Poler SM. Cutting Costs, Not Corners: Addressing Scheduling & Referral Inefficiencies in Orthopedic Clinic. Geisinger Educational Scholarship Symposium, Danville, PA May 2024.

5. Friedenbergs S, **Pradhan A,** Dragano R, **Latorre P,** Sponenberg M, **Zook A, Aftewicz H, Learn L,** Stoppie M, **Kerestes J,** Mackes K, Hill J, Martinez R, Silvagne J, **Webster L,** Callela A, Kosman J, **Wright E.** Using Design Thinking to Create a Health System Wide Approach to Addressing Unmet Headache Access. American Academy of Neurology Annual Meeting, Denver, CO, April 2024.

6. **Garasich FA,** Roberts AL, **Tusing L, Pradhan A, Piper BJ, Wright EA, Shetty VA.** Development of a Natural Language Process (NLP) to Extract Marijuana Data from Electronic Health Records (EHR). Susquehanna Valley Undergraduate Research Symposium, Lewisburg, PA, July 2023.

7. **Hendershot T, Fox MJ, Scavo P, Heikkinen B.** Adherence Assessment to Guidelines for Diabetic Foot Infections. American Society of Health System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

8. Kennalley AL, Stains EL, Bachir A, Rauls MO, Kraus CK, **Piper BJ.** Lack of evidence-based progress in certifying conditions for medical cannabis since publication of the 2017 National Academy of Sciences report. Geisinger Commonwealth School of Medicine Summer Research Immersion Program, Scranton, PA, July 2023.

9. Kim J, **Slampak-Cindric A.** Evaluation of Naloxegol in Critically Ill Patients with Opioid Induced Constipation. American Society of Health System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

10. **Knauer S, Sauers N, Mascarenhas V.** Mavacamten Initiation and Monitoring in an Interdisciplinary Hypertrophic Cardiomyopathy (HCM) Clinic. Geisinger 14th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, PA, March 2024.

11. **Kuloszewski MJ, Garasich FA, Piper BJ.** Pandemic policy impact: an analysis of methadone-involved overdoses following opioid treatment program changes. Susquehanna Valley Undergraduate Research Symposium, Lewisburg, PA, July 2023.

12. **Lombardo C, Fox M, Dillon C, Yanoski H, Hare J.** Adherence Assessment to Geisinger Health System Protocol for Surgical Prophylactic Antibiotics in Elective Joint Replacement Procedures. American Society of Health System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

13. Maddage J, Seward S, **Fox MJ, Kotch K.** Analysis of Acid Suppression Prescribing Practices in Patients with Clostridoides Difficile Infections. American Society of Health System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

14. **Mascaritola K, Walck A, Knauer S, Strouse C,** Tucker S. Evaluation of Proprotein Convertase Subtilisin/Kexin Type 9 Inhibitor (PCSK9i) Prescribing Opportunities in Clinical Atherosclerotic Cardiovascular Disease (ASCVD) and Elevated Low-Density Lipoprotein (LDL). American Society of Health System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim, CA, December 2023.

15. Narins A, **Rinkevich M, Mitsko S.** Design and Implementation of An Order Set to Prevent Duplicate Indication Constipation PRN Orders. Geisinger 14th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, PA, March 2024.

33. Olson A, **Bucaloiu A,** Allen C, **Tusing L,** Henzler-Buckingham H, **Gregor C, Wright EA,** Heller I, **Romagnoli KM.** Differentiating clinician approaches to opioid risk discussions for patients with OUD using archetypes informed by patient perspectives. Health Care Systems Research Network (HCSRN) Annual Conference, Milwaukee, WI, April 2024.

16. **Phang K.** Patient Education and Communication Campaign to Improve Lead Testing. Academic Pediatric Association QI Meeting, Toronto, Canada, May 2024.

17. **Pradhan AM, Shetty VA, Gregor CM, Chopra AA, Tusing L,** Hirsch AG, Hall E, Troiani V, Davis MP, Beiler DL, **Romagnoli KM,** Kraus CK, **Piper BJ, Graham JH, Wright EA.** Marijuana Use Documentation within Electronic Health Records (EHRs) at an Integrated Delivery Network (IDN): A Cross-Sectional Study. Health Care Systems Research Network (HCSRN) Annual Conference, Milwaukee, WI, April 2024.

18. **Pradhan A,** Sponenberg M, **Wright E,** Tavares S, Kobylinski M, **Webster L,** Holland N, Stefanowicz E, Friedenbergs S. Developing an Electronic Medical Record-based Alert for Treating Headaches in the Primary Care Office. American Academy of Neurology Annual Meeting, Denver, CO, April 2024.

19. Proctor L, **Heaney M, Rascona D.** Rate of 30-Day Mortality With Linezolid Compared to Clindamycin in Streptococcal Toxic Shock Syndrome. American College of Clinical Pharmacy (ACCP) Virtual Poster Symposium, Virtual, May 2024.

20. Proctor L, **Kerestes J, Jankowski A.** Appropriate Use and Optimum Inventory of Digoxin Immune Fab within Geisinger. American Society of Health-System Pharmacists (ASHP) Midyear Clinical Meeting & Exhibition, Anaheim CA, December 2023.

21. **Rinkevich M, Lawes S, Neville M.** Cumulative Acetaminophen Daily Dose Throughout Surgical Care. Geisinger 14th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, PA, March 2024.

22. Rodriguez LA, Finertie H, Neugebauer RS, Gosiker B, Thomas TW, Karter AJ, Gilliam LK, Oshiro C, An J, Simonson G, Cassidy-Bushrow AE, **Dombrowski SEK**, Nolan M, O'Connor P, Schmittdiel JA. Evaluation of Race and Ethnicity and Pharmacy Dispensing of SGLT2i and GLP-1 RAs in Patients with Type 2 Diabetes. American Heart Association Epi/Lifestyle Conference, Chicago, IL, March 2024.

23. **Romagnoli KM**, Lyons T, Hall E. Scholarly Research Output Tracking at Geisinger: A Scalable and Generalizable Semi-Automated Approach. American Medical Informatics Association (AMIA) Annual Symposium, New Orleans, LA, November 2023.

24. **Romagnoli KM**, Beiler DL, **Piper BJ**, **Pradhan AM**, Troiani V, **Tusing L**, **Gregor CM**, **Wright EA**. What Do We Know About Our Patients' Cannabis Use? A Mixed-Methods Approach. Health Care Systems Research Network (HCSRN) Annual Meeting, Milwaukee, WI, April 2024.

25. Shaffern CL, Chambers CL, **Chopra AA**, **Pradhan AM**, **Gregor CM**, **Tusing LD**, **Wright EA**, **Piper BJ**, **Romagnoli KM**. A Majority of Providers Approve of Potential Capture of Medical Marijuana by the Pennsylvania Drug Monitoring Program. Geisinger Commonwealth School of Medicine Summer Research Immersion Program, Scranton, PA, July 2023.

26. **Shetty VA**, **Gregor CM**, **Tusing LD**, **Pradhan AM**, **Romagnoli KM**, **Piper BJ**, **Wright EA**. A Content Analysis of Marijuana-Related Discussions Through Patient Portal Messages. Health Care Systems Research Network (HCSRN) Annual Conference, Milwaukee, WI, April 2024.

27. Stains EL, Kennalley AL, Bachir AS, Kraus CK, **Piper BJ**. Evidence-Based Medicine Up in Smoke: Uncovering the Blazing Disparities in Medical Cannabis Qualifying Conditions. Geisinger Commonwealth School of Medicine Spring Research Symposium, Scranton, PA, April 2024.

28. Stains EL, Kennalley AL, Bachir AS, Kraus CK, **Piper BJ**. Evidence-Based Medicine Up in Smoke: Uncovering the Blazing Disparities in Medical Cannabis Qualifying Conditions. Pennsylvania Pain and Addiction Summit, Wilkes-Barre, PA, April 2024.

29. Stains EL, Kennalley AL, Bachir AS, Kraus CK, **Piper BJ**. Evidence-Based Medicine Up in Smoke: Uncovering the Blazing Disparities in Medical Cannabis Qualifying Conditions. University of Scranton Neuroscience Meeting, Scranton, PA, April 2024.

30. Troiani V, Beiler DL, **Gregor CM**, Soares J, **Chopra AA**, **Tusing L**, **Piper BJ**, **Romagnoli KM**, **Pradhan AM**, Kraus CK, **Wright EA**. A Novel REDCap Instrument for the Extraction and Analysis of Marijuana Use from EHR data. Health Care Systems Research Network (HCSRN) Annual Meeting, Milwaukee, WI, April 2024.

31. **Uber R, Hayduk V, Ward T, Flango A.** Development of pharmacogenomics training resources for embedded primary care pharmacists. ClinPGx 2024 Meeting, Philadelphia, PA, June 2024.

32. **Uber R, Hayduk V, Ward T, Flango A.** Pharmacogenomics knowledge and perceptions among pharmacists embedded in Medicare-only primary care clinics. Health Care Systems Research Network (HCSRN) Annual Conference, Milwaukee, WI, April 2024.

33. **Varela Gonzalez N, Longyhore D.** Utilization of an in-EHR Patient Education Library for Patients Newly Discharged on an Anticoagulant. Geisinger 14th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, PA, March 2024.

34. **Varela Gonzalez N, Tice S.** Glycemic Management in Patients Receiving Parenteral Nutrition. American Society for Parenteral and Enteral Nutrition (ASPEN) Annual Meeting, Tampa, FL, March 2024.

35. **Zook A, Pradhan A, Webster L, Kachmarsky M, Wright E**, Friedenber g S. Delivering Evidence Based Care by Comanaging Headache Patients with a Primary Care Clinical Pharmacist. American Academy of Neurology Annual Meeting. Denver, CO, April 2024.

About Geisinger

One of the nation's most innovative health services organizations, Geisinger serves more than 1 million patients in Pennsylvania. The system includes 10 hospital campuses, a health plan with more than half a million members, two research centers and the Geisinger Commonwealth School of Medicine. A physician-led organization, with 25,000 employees and more than 1,700 employed physicians, Geisinger leverages an estimated \$8 billion positive annual impact on the Pennsylvania economy. Repeatedly recognized nationally for integration, quality and service, Geisinger has a long-standing commitment to patient care, medical education, research and community service. For more information, visit [geisinger.org](https://www.geisinger.org) or connect with us on Facebook, Instagram, LinkedIn and Twitter.



The system is composed of the following entities:

Geisinger Clinic is widely regarded as a national model of healthcare delivery centered around a cutting-edge multispecialty group practice of more than 1,700 primary and specialty physicians who practice at Geisinger hospitals and non-Geisinger hospitals throughout the region.

Geisinger Medical Center (GMC) – Danville, Pa. The largest tertiary/quaternary care teaching hospital in central and northeastern Pennsylvania, GMC has earned a reputation for providing leadingedge medicine and treating the most critically ill patients. GMC is licensed for 505 beds, including 91 pediatric beds in the Geisinger Janet Weis Children’s Hospital. GMC maintains the region’s only Level I regional resource trauma center with additional qualifications in pediatrics. GMC offers a comprehensive array of highly specialized medical and surgical services, including neurosciences, cardiovascular services, transplantation, women’s health, pediatrics, orthopaedics and oncology.

Outpatient services, including endoscopy and same-day surgery, are available on GMC’s main campus, as well as at the Outpatient Surgery Center, located at the Geisinger Healthplex Woodbine campus.

GMC’s Hospital for Advanced Medicine serves as an integrated center for the most critically ill patients. This “hospital within a hospital” houses nine stories of patient-focused space, including acuity adaptable beds that can convert from intensive care to recovery as the patient progresses. The hospital offers state-of-the-art inpatient and physician office facilities with cardiovascular services residing within the building, a surgical suite equipped with sophisticated robotic and interventional medical equipment, and shell space for future growth. This hospital is LEED certified silver (Leadership in Energy and Environmental Design), with environmentally friendly designs, recycled materials used in its construction and increased energy efficiency achieved by maximizing natural window light in patient rooms and offices.

Geisinger Shamokin Area Community Hospital (GSACH) — Coal Township, Pa. This hospital merged into Geisinger Medical Center in 2012. A campus of

Geisinger Medical Center, GSACH has a total of 48 beds, including 30 med/surg beds, 10 Post-Surgical Unit beds, seven Special Care Unit beds and one bed in the Biocontainment Unit. GSACH also has cardiac and pulmonary rehabilitation departments, and the Ressler Center offers specialty outpatient clinic appointments on campus.

Geisinger Wyoming Valley Medical Center (GWV) — Wilkes-Barre, Pa. Located in Plains Township, GWV is an acute tertiary care center that brings advanced clinical services to northeastern Pennsylvania. Licensed for 272 beds, GWV’s state-of-the-art Critical Care Building houses the only Level I trauma center in Luzerne County. The GWV campus includes the Frank M. and Dorothea Henry Cancer Center, the Richard and Marion Pearsall Heart Hospital (an accredited Chest Pain Center), the Tambur Neonatal Intensive Care Unit, the Geisinger Janet Weis Children’s Unit, a transplant program, the Brain & Spine Tumor Institute and more. GWV’s Women’s Health Program and various specialty clinics are offered at facilities in close proximity to the main campus.

Geisinger South Wilkes-Barre (GSWB) — Wilkes-Barre, Pa. GSWB is GWV’s ambulatory campus. It offers an array of same-day health services, including adult and pediatric urgent care centers, inpatient and outpatient rehabilitation, same-day surgery, pain and sleep centers and an Emergency Department.

Geisinger Community Medical Center (GCMC) — Scranton, Pa. GCMC is a leading provider of quality healthcare services in northeastern Pennsylvania. Home to Scranton’s only Level II trauma center, GCMC also has an adult inpatient behavioral health unit. It is licensed for 304 beds and features an array of clinical programs including orthopaedic services and a broad range of other specialized surgical and radiologic services.

Geisinger Bloomsburg Hospital (GBH) — Bloomsburg, Pa. GBH is licensed for 60 beds and is an acute-care hospital offering patients a variety of primary and specialty care services, a broad spectrum of surgical services, including in-and-out

surgery, obstetrics/maternity, behavioral health and a progressive emergency medicine and hospitalist program.

Geisinger Lewistown Hospital (GLH) — Lewistown, Pa. GLH is licensed for 133 beds and serves the residents of rural Centre, Mifflin, Juniata, Perry, Snyder and Huntingdon counties. It is an open-staff, acute-care community hospital that offers emergency, surgery, imaging, endoscopy, orthopaedics and cardiology services, among others.

Geisinger Jersey Shore Hospital (GJSH) — Jersey Shore, Pa. Licensed for 25 beds, GJSH joined Geisinger in 2017, though it opened as a private hospital in the early 1900s. It serves the residents of Clinton and western Lycoming counties, and is designated as Geisinger’s only critical access hospital by the Commonwealth of Pennsylvania and the Medicare Program. GJSH is accredited by The Joint Commission, and offers inpatient, acute, emergency, outpatient and sub-acute care.

Geisinger Medical Center Muncy (GMCM) — Muncy, Pa. This full-service hospital opened in 2022 as part of a clinical joint venture between Geisinger and Highmark Health that expands access to care for those who need it most in Clinton, Lycoming, Sullivan and Tioga counties. The hospital is licensed for 20 inpatient beds and 10 ED beds. For routine care, the facility includes a multispecialty clinic with adult and pediatric primary care, orthopaedics, cardiology, ophthalmology and women’s health services. Specialty outreach services, imaging, lab, medical oncology services, chemotherapy preparation and general surgery are also offered.

Geisinger St. Luke’s Hospital (GSL) — Orwigsburg, Pa. GSL is a joint venture hospital between Geisinger and St. Luke’s University Health Network serving Schuylkill County, Pennsylvania. Licensed for 80 beds, GSL is an accredited Primary Stroke Center and also provides specialized emergency medical services. It offers low-dose CT scanners and 3D mammography, as well as surgical, radiology and multiple specialty services.

Geisinger Health Plan (GHP) is the not-for-profit health insurance component of Geisinger. GHP provides high-quality, affordable healthcare benefits for businesses of all sizes, individuals, families, Medicare beneficiaries and Medicaid recipients. GHP serves more than half a million members in 44 counties throughout central, south-central and northeastern Pennsylvania. The provider network includes nearly 30,000 participating providers and 100+ participating hospitals. Additionally, GHP has partnered with Centers for Medicare & Medicaid Services (CMS) to provide Medicare benefits to 90,000 beneficiaries in the state. GHP also provides coverage to over 200,000 Medicaid recipients in the Commonwealth.

Research at Geisinger has been a key element of Geisinger’s mission since the beginning. The current phase of research began in 2009, when we began a comprehensive Research Strategic Planning process which confirmed and elevated the role of research in Geisinger’s mission. It emphasized research that improves health and healthcare — not only for our own patients, but also for patients nationally and globally through scholarly publications and presentations. Our board and leadership challenged us to conduct research that can be uniquely done at Geisinger, leveraging our high-quality patient care; our fully integrated healthcare system; our large, stable patient population; our advanced electronic health record; and our clinical data warehouse. Research is key to the development and implementation of the next generation of best practices with the goal of disease prevention as well as improved outcomes across a broad spectrum of clinical areas.

Dedicated research facilities include the Sigfried and Janet Weis Center for Research and the Henry Hood Center for Health Research in Danville, Pa.; the Susquehanna Valley Imaging Center in Lewisburg, Pa.; and the Geisinger Precision Health Center in Forty Fort, Pa.

Geisinger College of Health Sciences — Established as the umbrella entity uniting Geisinger’s schools of medicine, nursing and graduate education, the College of Health Sciences leverages the system’s

unique approach to value- and team-based care for all learners. The medical school has campuses in Atlantic City, Danville, Lewiston, Scranton, Wilkes-Barre and Sayre. The School of Nursing is based in Lewistown, and the School of Graduate Education is both virtual and in-person on the Scranton campus. Both the medical and graduate schools are accredited by the Middle States Commission on Higher Education, while the Liaison Committee on Medical Education also accredits the medical school. Graduate medical education is accredited by the Accreditation Council for Graduate Medical Education. The School of Nursing holds accreditation from the Accreditation Commission for Education in Nursing.

Geisinger Community Health Services (GCHS) is a not-for-profit organization that annually provides healthcare services to nearly 40,000 patients in the communities in which they live and work. GCHS is committed to advocacy, excellence and innovation in the provision of services that complement and expand the continuum of care provided by the health system. Its programs include:

- ConvenientCare, which provides walk-in urgent healthcare services in the evening and on weekends when physician offices are closed
- Health Care Quality Unit nurses who educate community members and caregivers of intellectually disabled individuals
- LIFE Geisinger, which provides a comprehensive program of health and social services to the frail elderly

International Shared Services Inc. is a wholly owned, for-profit subsidiary of Geisinger Medical Management Corporation. It provides comprehensive clinical engineering and computer technical services to providers both within and outside Geisinger.

Geisinger Marworth Treatment Center, located in Waverly, Pa., is recognized as a national leader in the treatment of alcohol and chemical dependency. Geisinger Marworth has over 90 beds and offers personalized residential and outpatient programs as well as specialized programs for healthcare and uniformed professionals.

Geisinger Life Flight® is a component of the system's response to critical care transport needs, with 9 air ambulances and two ground ambulances operating 24 hours a day, 7 days a week from the following locations:

- Penn Valley Airport, Selinsgrove
- Wilkes-Barre/Scranton International Airport, Avoca
- University Park Airport, State College
- Williamsport Regional Airport, Montoursville
- Good Will Fire Department, Minersville
- Jake Arner Memorial Airport, Lehighton

Life Flight averages 3,600 patient transports a year.

