

Geisinger

2018–2019

Geisinger Enterprise Pharmacy

Year in review





Our mission

To work collaboratively with healthcare professionals across Geisinger and the communities 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 be the premier steward for all medication-related needs across Geisinger.

To be recognized as a national model for medication management and pharmacy management and for leading innovative and evidence-based programs of care delivery, research and education.

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Message from vice president of Enterprise Pharmacy and chief pharmacy officer

I am proud to present to you our 2018–2019 Geisinger Enterprise Pharmacy Annual Report. As I reflect on the last year of Enterprise Pharmacy, I continue to be amazed at how the team has come together — especially this year, as we went through a large restructure of the team moving from a vertically aligned process to a horizontally aligned process focused on the patient, no matter where they are in the continuum of care. Whether we are touching the patient at home, in an ambulatory care site, in a retail mail-order specialty home infusion pharmacy or a specialty pharmacy, during admission or discharge or in the emergency room, just watching the team work together to focus on a patient-centric process has been very rewarding.

We have done outstanding work in all our pillars of pharmacy this year. I'd like to highlight some of the progress we have made.

Mail-order pharmacy. Moving our patients to mail-order pharmacy really encompasses our overall strategy for Enterprise Pharmacy: to close the gap in care and coverage. We want to offer 360-degree services to every patient we serve when a pharmaceutical is involved, and we have the delivery services in place for the care of that patient. Whether the patient's pharmacist is in direct patient care, or it's clinical services, home infusion, specialty or prescription at home, we are bringing the patient to us. That is really the intent of Enterprise Pharmacy and what it will be as we continue moving forward over the next several years, adding programs and processes and expanding the scope and breadth of our geographic coverage area for our retail and specialty networks to meet the needs of our patients.

Move of VITALine into Geisinger Clinic. Another big success is the growth of VITALine and bringing them from the for-profit arm of Geisinger into Geisinger Clinic and integrating this team in with the rest of Enterprise Pharmacy. Work will continue as we grow the program, making our clinicians, our clinics and other system processes aware that we have a home infusion pharmacy in house and what they can do.

Expansion of medication therapy disease management program. The traditional role of the medication therapy disease management program has been in primary care and helping as a physician extender on concentrated quality disease management. Over the past year, we expanded our coverage in primary care sites and added to the repertoire of chronic diseases that pharmacists care for, including chronic obstructive pulmonary disease, heart failure and pain management. As we continue to grow our specialty pharmacy with a 50 percent increase in our prescription volume over the last year, we continue to expand our areas of specialty disease — including Crohn's disease, ulcerative colitis and rheumatoid arthritis — while also building upon our multiple sclerosis and hepatitis C programs. And we tie it all back to make sure we continue to match our care and coverage.

Managed Care Pharmacy. The continued growth of the Geisinger Health Plan pharmacy, or Managed Care team, has been key in driving toward our "one Geisinger" initiative to increase quality and decrease costs for the health system.

Pharmacy innovation and outcomes. Over the last year, the Center for Pharmacy Innovation and Outcomes continues to integrate into the continuum of Enterprise Pharmacy to ensure that the programs we are developing and implementing are assessed in a rigorous, scientific manner, and then moved to publication to spread the word of all the good things we are doing at Geisinger.

Medication distribution decentralization process. We continue to make strides in moving forward the medication distribution decentralization process to decrease the burden of stacked doses from the pharmacy and to make the medications available to the nurse administration team on the floors when needed. This will continue into the new year at some of the hospital platforms.

Continued integration of AtlantiCare into pharmacy. The system collaboration with AtlantiCare, a member of Geisinger, began in 2011. In 2015, we started planning to determine the future of pharmacy in AtlantiCare. We have continued to integrate them into our contracts, wholesale and processes, and are assisting in the redesign of their pharmacy pillars. An early win has been building out the medication therapy disease management anticoagulation program there.

Financial contributions. All these initiatives and more are where Enterprise Pharmacy continues to contribute to the bottom line of Geisinger by focusing on opportunities where we can improve our processes and achieve cost savings. In fiscal year 2019 (FY19), we had a target of \$60 million — and we ended the year with more than \$90 million.

I am honored to represent Geisinger's Enterprise Pharmacy, and I look forward to the upcoming year.

Welcome to the 2018–2019 Geisinger Enterprise Pharmacy Annual Report.



Michael A. Evans, RPh
Vice President of Enterprise Pharmacy
Chief Pharmacy Officer
Geisinger

Enterprise Pharmacy

There have been new changes to the structure of Enterprise Pharmacy over the last year. We have created a process where the structure matches the need and created a decrease in span of control for our managers including succession plans that didn't exist before.

Enterprise Pharmacy is represented across all our hospital platforms, community practice sites, and pharmacy locations. There are 826 employed in Pharmacy today, including 347 practicing pharmacists and 277 pharmacist technicians.

Enterprise Pharmacy consists of nine distinct areas, or pillars, of practice.* These include:

- Acute Disease Management, *formerly called Acute Care operations and clinical programs*
- Ambulatory Disease Management, *formerly called Ambulatory Care clinical programs*
- Operations and Compliance, *new to FY19*
- Medication Distribution, *formerly called Outpatient Services*
- Contracting and Procurement, *formerly called Formulary*
- Center for Pharmacy Innovation and Outcomes
- Managed Care, *formerly called Geisinger Health Plan Pharmacy*
- Informatics and Strategy, *formerly called Informatics*
- Knowledge Management, *added late FY19*

*The former Infusions pillar has been wrapped into Medication Distribution and the Business and Financial pillar was removed as a distinct area.

Each pillar and its FY19 successes are described in more detail throughout this report. FY19 encompasses July 1, 2018, through June 30, 2019.



Update on the pillars of Enterprise Pharmacy

Acute Disease Management

Geisinger's Enterprise Pharmacy Acute Disease Management pillar provides services to 9 hospitals, 2 ambulatory surgery centers, 15 ambulatory infusion centers (including hematology/oncology) and many hospital-based clinics located throughout Pennsylvania.

Acute Disease Management FY19 by the numbers

- 9 hospitals
- 2 ambulatory surgery centers
- 15 ambulatory infusion centers

Our nationally recognized, long-standing, progressive pharmacy practice model features clinical pharmacists practicing in a decentralized model under a collaborative practice agreement in many specialties. Technology, automation and our skilled pharmacy technician staff enable and sustain our current practice model. Since our pharmacists are embedded in the patient care units, they are readily accessible to nursing, advanced practitioners, physicians and other healthcare staff as well as to our patients. In general, our clinical pharmacists are responsible for order review and verification, dispensing, pharmacokinetics, antimicrobial stewardship, anticoagulation management, renal dosing adjustments, therapeutic substitution, IV-to-oral therapeutic interchange, patient education and emergency bedside response. In several of our hospitals, the pharmacists attend daily multidisciplinary patient care teaching rounds where they provide valuable input to the patient care team and provide medication therapy recommendations right at the patient's bedside. All platforms have interdisciplinary team rounds in which the

pharmacists participate to make recommendations on any medication-related therapy or issues in the patient's plan of care for the day. Outside of their general daily responsibilities, the clinical pharmacist, depending on practice area, provides additional pharmacy clinical services, including parenteral nutrition management, chemotherapy dosing and chemotherapeutic plan management, pain management consults and bone marrow transplant immunosuppression monitoring.

Pharmacy practice areas:

Adult critical care
Bone marrow transplant
Cardiology
Emergency medicine
Hematology
Infectious diseases
Internal medicine
Medication reconciliation
Neonatal critical care
Nephrology
Nutrition
Oncology
Operating room
Pediatric critical care
Pediatric hematology/oncology
Pediatrics (general)
Rehabilitation
Solid organ transplant
Trauma

Emergency pharmacist bedside response services:

Adult and pediatric codes

Adult and pediatric trauma alerts

Pulmonary embolism alerts

Sepsis alerts

Stroke alerts

Others: RSI, STEMI, conscious sedation

Emergency bedside response is an example of a critical area in which pharmacists actively participate. This year, Geisinger Wyoming Valley Medical Center (GWV) received Comprehensive Stroke Center Certification, which is the highest designation that can be achieved, recognizing hospitals that meet standards to treat the most complex stroke cases. GWV joins Geisinger Medical Center (GMC) in this recognition. The decreased door-to-needle times for tPA (tissue plasminogen activator) administration needed for this certification are largely attributed to the bedside response of a pharmacist to stroke alerts. The pharmacist arrives at the bedside with a tPA kit, participates in deciding if tPA is indicated or contraindicated and then mixes it for immediate administration when needed. A stroke alert is just one of many emergency bedside alerts that a pharmacist responds to. Another example is code response, in which the pharmacist is responsible for running the medication cart during the code, drawing up the medications, anticipating needs and filling in other roles on the code team as needed.

Yet another major aspect of an acute clinical pharmacist's responsibilities is teaching, which follows not only Geisinger's mission statement but that of Enterprise Pharmacy as well. Enterprise Pharmacy leadership believes strongly that we have a duty to provide education to our

healthcare colleagues, to our patients and to the future practitioners of our profession. We actively collaborate with several schools of pharmacy as well as our own Geisinger Commonwealth School of Medicine. This year, we have added four faculty members from Wilkes University's Nesbitt School of Pharmacy at two of our hospital campuses in northeast Pennsylvania to facilitate hosting additional pharmacy students. One of those faculty members was added to start a new transitions of care service that we are developing as a joint initiative between Wilkes and Geisinger. Outside of the faculty, our pharmacists have many opportunities to teach. They precept pharmacy residents in our PGY-1 residency programs at GMC and GWV as well as in our PGY-2 oncology residency program at GMC. Geisinger Medical Center expanded its PGY-1 program this year from three residents to five, which was implemented with the July 2019 class of residents. In addition to precepting residents, our pharmacists precept pharmacy students from more than 10 schools of pharmacy for both APPE and IPPE learning experiences. Preceptor development is a required component of each acute clinical pharmacist's annual feedback summary, ensuring that our pharmacists are well-equipped to be top-notch educators. There are formal opportunities to present at multidisciplinary continuing education conferences and nursing in-services, as well as daily opportunities to teach patients and other healthcare professionals on a one-on-one basis.

Pharmacists also participate in many other avenues related to patient care. Many are active participants on multidisciplinary committees and workgroups. They complete formulary drug reviews, develop guidelines and best practice standards, conduct medication use evaluations, develop order sets for our electronic health record, participate actively in national, state and local pharmacy organizations and volunteer. Our pharmacists can also participate in research, partnering with our colleagues in the Center for Pharmacy Innovation and Outcomes.

Major accomplishments in the year

Renovations of IV clean rooms

Overall, FY19 was a busy, challenging and exciting year for acute care. Most notably, almost all our IV clean room areas across the system have either gone through or are undergoing renovations for compliance with USP 797/800. Geisinger Medical Center and Geisinger Community Medical Center had renovations on their entire main pharmacy areas, as well.

Team restructure

The other large change initiative in acute care was our restructure. Previously, our leadership team was divided into clinical and operational aspects. This arrangement didn't align with our current practice model in which our pharmacists are responsible for both clinical and operational aspects of practice. We merged our management structure to account for all those aspects in the same reporting structure and added other working managers to both pharmacist and technician staff where they were needed to increase employee engagement and collaboration.

Heart failure medication optimization consults

One new clinical initiative that was launched this fiscal year was heart failure medication optimization consults. These consults have been added at the request of our system leadership to increase the adherence to goal-directed medication therapy with our patients who are suffering from heart failure. The pharmacists do a thorough assessment of the patient's medication therapy, including an anemia assessment; make recommendations for evidence-based therapy during the patient's hospitalization and post-discharge; and complete the discharge medication reconciliation.

FY19 highlights/accomplishments:

- ◆ Completion of Acute Care Pharmacy restructure
 - System director to oversee all of acute care, clinical and operations
 - 3 directors at largest hospital campuses
 - 7 assistant directors – 5 at large and medium hospital campuses, 1 each for Hematology/Oncology and Infusion for the system
 - 3 managers at largest hospital campuses, 4 managers at small hospital campuses – all managers are staffing
 - 16 coordinators across all campuses including Hematology/Oncology and Infusion – all coordinators are staffing
 - 5 technician supervisors at large and medium campuses
 - 8 technician leads at largest hospital campuses
- ◆ Construction projects
 - Sterile product and hazardous product preparation areas renovated:
 - 14 completed
 - 2 ongoing – completion in FY20
 - 1 scheduled for FY20
 - Main pharmacy renovations
 - GMC
 - GCMC
- ◆ **Residency program expansion** – GMC's PGY-1 residency program expanded to five residents beginning July 2019. Additional residency program expansions are planned for FY20.
- ◆ **Wilkes University Nesbitt School of Pharmacy faculty at Geisinger** – This partnership integrates two faculty members into our pharmacy care model at two northeast sites: GWV and GCMC. One faculty member at GWV will be joining the Transition of Care team.

◆ **Inpatient heart failure medication optimization**

consults – Pharmacists are consulted to do complete assessment of patients’ medications, provide recommendations for medication therapy and anemia management and preemptively perform discharge medication reconciliation.

◆ **Acute Post-Discharge Medication Reconciliation Program**

– This program launched at GMC in collaboration with Care Management, where high-risk heart failure and COPD patients are identified upon discharge for enrollment in intervention. The intervention involves a community health assistant being sent to the patient’s home within 72 hours of hospital discharge. The visit is paired with a pharmacist’s phone call to review the patient’s medications and address any medication-related issues, including adherence, access and medication list inaccuracies. Expansion of the program is planned for FY20.

◆ **Hematology/oncology**

- Hematology/Oncology Pharmacy & Therapeutics subcommittee formed from the system Pharmacy and Therapeutics committee, specifically dedicated to hematology/oncology (H/O)
- Dedicated pediatric H/O pharmacist added to support the needs of our youngest hem/onc patients, providing support on both the inpatient and ambulatory side

◆ **Decentralization medication dispensing**

- GMC completed decentralization, including decommissioning its Rx Robot that had been in place as dispensing automation for 20+ years.

◆ **Anesthesia work station rollout** – GMC campus went live with 52 anesthesia work stations in February 2019. The rest of the hospital campus operating room areas will have these added in FY20.

Hospital	Beds	Pharmacy satellites	Operating hours	Supported services
Geisinger Medical Center (GMC)	524	Cancer Center Operating room Inpatient Hem/Onc Peds	24/7	6 amb infusion ctrs 1 ASC
Geisinger Wyoming Valley Medical Center (GWV)	252	Cancer Center Operating room	24/7	2 amb infusion ctrs
Geisinger Community Medical Center (GCMC)	293	Cancer Center Operating room	24/7	1 amb infusion ctr
Geisinger Holy Spirit (GHS)	306		24/7	1 amb infusion ctr
Geisinger Lewistown Hospital (GLH)	123		7 days/wk day shift + evenings	1 amb infusion ctr
Geisinger Bloomsburg Hospital (GBH)	76		7 days/wk day shift	
Geisinger Shamokin Area Community Hospital (GSACH)	48		7 days/wk day shift	
Geisinger South Wilkes-Barre (GSWB)	48		7 days/wk day shift + evenings	4 amb infusion ctrs
Geisinger Jersey Shore Hospital (GJSH)	25		5 days/wk day shift	
Windmere	N/A		5 days/wk day shift	1 amb infusion ctr ASC

Hospital	RPh FTE	PGY-1 residents	PGY-2 residents	Pharm Tech FTE	Med Hx Tech FTE
Geisinger Medical Center (GMC)	54.35	5	1	41.2	4
Geisinger Wyoming Valley Medical Center (GWV)	35.8	2		22.2	
Geisinger Community Medical Center (GCMC)	25.3			18.25	
Geisinger Holy Spirit (GHS)	16.45			14.55	3.7
Geisinger Lewistown Hospital (GLH)	8			10.46	
Geisinger Bloomsburg Hospital (GBH)	2.1			3	
Geisinger Shamokin area Community Hospital (GSACH)	3			4.3	
Geisinger South Wilkes-Barre (GSWB)	2			3.5	
Geisinger Jersey Shore Hospital (GJSH)	1.1			2	
Hem/Onc	10.4			6.5	
Infusion	3				

Hospital	Leadership		
Geisinger Medical Center (GMC)	Director	Assistant director	Tech supervisor
Geisinger Wyoming Valley Medical Center (GWV)	Director	Assistant director	Tech supervisor
Geisinger Community Medical Center (GCMC)	Director	Assistant director	Tech supervisor
Geisinger Holy Spirit (GHS)		Assistant director	Tech supervisor
Geisinger Lewistown Hospital (GLH)		Assistant director	Tech supervisor
Hem/Onc		Assistant director	
Infusion		Assistant director	

Hospital	Working managers		
Geisinger Medical Center (GMC)	Manager	4 coordinators	3 lead pharm techs
Geisinger Wyoming Valley Medical Center (GWV)	Manager	3 coordinators	3 lead pharm techs
Geisinger Community Medical Center (GCMC)	Manager	2 coordinators	2 lead pharm techs
Geisinger Holy Spirit (GHS)		1 coordinator	
Geisinger Lewistown Hospital (GLH)		1 coordinator	
Geisinger Bloomsburg Hospital (GBH)	Manager		
Geisinger Shamokin area Community Hospital (GSACH)	Manager		
Geisinger South Wilkes-Barre (GSWB)	Manager		
Geisinger Jersey Shore Hospital (GJSH)	Manager		
Hem/Onc		3 coordinators	
Infusion		2 coordinators	



Ambulatory Disease Management

For close to 25 years, Geisinger ambulatory clinical pharmacists have played a critical role in the optimization of medication therapy and disease management and the delivery of high-quality, patient-centered care. The program began as one pharmacist managing anticoagulation in 1996 and has grown to become a nationally recognized model for clinical pharmacy services, particularly around quality and innovation. In 2016, the program received the ASHP Award of Excellence as well as the PSHP Innovative and Collaborative Practice Award, and later that same year, it was named as a finalist for the ASHP Award of Excellence in Medication Safety for its Chronic Pain Management Program.

Currently, the program has more than 90 ambulatory clinical pharmacists either embedded in one of 54 practice sites across the system or within our centralized Telepharmacy clinic. Empowered by collaborative practice agreements with several hundred Geisinger physicians, the pharmacists manage patients' medication therapy for 25 medical conditions and contribute to the delivery of value-based care by improving clinical outcomes while reducing cost of care and maintaining excellent patient experience. Within the ambulatory pharmacy platform, there are four practice models: primary care, specialty medicine, home-based primary care (Geisinger at Home) and Telepharmacy.

Ambulatory Disease Management FY19

by the numbers

- 77 ambulatory pharmacists, 15 pharmacy clinic assistants
- 21 telepharmacy pharmacists, 34 telepharmacy pharmacy technicians
- 54 practice sites across Geisinger
- 11 clinical pharmacy specialties
- 395,473 completed patient encounters (32% office visits, 68% phone visits)
- 24,901 new pharmacist consults
- 434,000 incoming calls in Telepharmacy
- 428,000 medication orders approved in Telepharmacy
- 48,640 lab orders placed and 55% completed in Telepharmacy
- 402 patients with diabetes identified where HBA1c >9%, and 290 referred to ambulatory pharmacist disease management

Clinical pharmacy specialties

- Addiction medicine
- Anemia
- Behavioral health
- Cardiology
- Family practice and internal medicine
- Gastroenterology/hepatology
- Geriatrics
- Home-based primary care
- Medically complex children
- Neurology
- Pain management

Services

Primary care – There are 48 primary care pharmacists embedded within family practice and internal medicine sites across the health system. The pharmacist's practice is a model of care based on comprehensive and high-value office-based visits. They are responsible for the ongoing management and co-ownership of chronic disease patients at primary care sites. These pharmacists help to improve medication-related patient outcomes and assist primary care providers in decreasing healthcare costs and meeting quality benchmarks. The pharmacists perform comprehensive medication reviews and medication reconciliation, identify and resolve medication-related problems, manage chronic disease states through evaluation of the safety and effectiveness of medication regimens (including titration and monitoring towards targeted patient outcomes), design patient-centered, cost-effective medication regimens and provide education to patients and providers.

Specialty medicine – In addition to primary care team members, 19 ambulatory pharmacists are integrated into various specialty medicine departments. The specialty practice model, which is primarily telemedicine-based, is customizable to the needs of the medicine department and tends to be more population health focused. Specialty ambulatory pharmacists help lead the system's clinical treatment pathway development process within their medicine disciplines and work closely with pharmacists from Geisinger Health Plan and Geisinger CareSite Specialty Pharmacy to coordinate and optimize patient care.

Home-based primary care – One of Geisinger's newest initiatives, Geisinger at Home (G@H), is an interprofessional home-based primary care model instituted to increase access and decrease high-cost utilization for the system's neediest patients. Five clinical pharmacists work in collaboration with registered nurse case managers, advanced

practitioners, community health assistants and regional medical directors. The pharmacists primarily practice telephonically and through telemedicine, communicating with another G@H provider while they are in the patient's home. They provide comprehensive medication management, acute and chronic medication and disease management, drug information, assistance with drug procurement, acute disease co-management and disease state monitoring. They work closely with other members of the G@H team to optimize patients' medication regimens. Some of these patients are on upward of 30 medications, thus comprehensive medication management is a key responsibility.

Comprehensive medication management (CMM) is a service where pharmacists take a holistic look at a patient's medication regimen and adjust therapy to ensure evidence-based and patient-centered use of medications. This includes both adding medication when indicated and removing medications that may no longer be needed. To date, pharmacists working with the G@H team have performed over 200 CMMs where they identify an average of 4 medication-related problems (MRPs) per patient. These MRPs are communicated to, and intervention is in collaboration with, the G@H provider team. In the near future, the pharmacists will utilize telemedicine technology to perform medication reconciliations in the home with the aid of the community health assistant.

Telepharmacy – The newest member of the ambulatory care team is our Telepharmacy program. Telepharmacy is a centralized, highly efficient and multifaceted pharmacy team that has taken ownership of the system's telephonic and electronic incoming medication-related messages. They manage all medication-related communications and refill requests entering the system, saving physicians and their support staff hours of work every week. In addition, the program has recently begun to collaborate with the family practice and specialty



medicine disease management pharmacists to implement a series of clinical programs including tele management of anticoagulation patients and referral of patients identified as having poorly controlled diabetes to the primary care pharmacists.

In the coming year(s), Geisinger's ambulatory program strategic plan includes the addition of clinical pharmacists in new practice areas (e.g. Federally Qualified Health Centers, senior-focused care sites, Rheumatology and Accountable Care Organization partner sites), the incorporation of machine learning-based referrals and interventions into the workflow, continued Population Health work around analytic driven interventions, the expansion of current pharmacy services in cardiology, pulmonology, behavioral health and possibly geriatrics (LIFE Geisinger) and the development/rollout of 'Ask-A-Pharmacist' functionality. The primary care disease management program is set to undergo a large-scale expansion in response to a looming physician shortage in primary care and a subsequent need to create more appointment access for our community medicine partners. The Telepharmacy team will continue to expand its clinical service around anticoagulation management and population-health-based outreach, begin the implementation of a new refill protocol and care gap software, incorporate a telework option into its practice model and continue to explore ways to align with call center and clinic assistant teams across Enterprise Pharmacy. And finally in FY20, Geisinger will see its first ambulatory clinical pharmacy residency program open its doors.

Major accomplishments in the year

Expansion of the Telepharmacy program

The Telepharmacy program underwent an aggressive expansion in FY19 as its practice model changed in response to demands from the system to help offload some of the call and inbasket volume from the providers. What started as a small pharmacy call center nine months earlier very quickly became the health system's primary hub for all incoming medication-related calls and electronic medication refill requests. During this same time, and parallel with the onboarding of these new demands, the team grew from 4 pharmacists and 12 pharmacy technicians to 21 pharmacists and 30 pharmacy technicians.

By the end of FY19, Telepharmacy was fielding 36,166 calls per month, approving 65,000 medication refills per month and managing both the phone and in-basket medication-related volume for every community medicine site across the system (outside of Holy Spirit). Additionally, in a concerted effort to positively affect clinical outcomes and appointment access for their ambulatory disease management partners within community medicine, Telepharmacy developed a clinical care gap closure initiative around ordering overdue lab work and identifying patients with uncontrolled diabetes to refer to the ambulatory disease management pharmacists. The program also began to implement a process around anticoagulation tele management for those patients previously managed telephonically by the family practice clinical pharmacists. The result was 26,960 lab orders completed, 402 uncontrolled diabetics referred to MTDM over a nine-month period and the completion of 6601 anticoagulation encounters since January 2019.

Implementation of patient satisfaction for pharmacy services

Recognizing the need to supplement the currently available operational and clinical outcome metrics with patient satisfaction information, ambulatory leadership worked diligently over the course of the first half of FY19 with the Center for Pharmacy Innovation and Outcomes and Patient Experience leadership to create and implement a modified Press Ganey® Associates Inc. Medical Practice Survey. This was a significant, innovative step forward for our family practice pharmacists as we became the first large-scale ambulatory pharmacy team to implement a tool like this. The survey would allow us to accurately get a measure of staff performance to benchmark against tens of thousands of primary care providers across the country with results that could be operationalized as a performance improvement tool to help facilitate service recovery. The survey went live in January 2019 with results for the “care provider” portion of the survey at a rank of 91 percent, which means we performed better than all but 9 percent of the primary care providers within Press Ganey’s system.

FY19 highlights/accomplishments:

- ◆ Restructured and expanded the ambulatory care leadership team to include a new assistant director for Telepharmacy, 3 regional managers, 4 clinical coordinators and a Telepharmacy pharmacy tech supervisor
- ◆ Received system and medicine leadership approval for a large expansion in our family medicine sites over the next 3 fiscal years
- ◆ Implemented a system-wide primary care physician education effort around peri-operative management of anticoagulation patients
- ◆ Worked closely with Geisinger’s machine learning and artificial intelligence teams to implement a pilot and proof of concept for a morbidity/mortality prediction model in heart failure patients
- ◆ Worked with our data and analytics team to develop a chronic pain management dashboard for the patients our pain pharmacists manage
 - For the period from January 2017 to January 2019:
 - 15.5 percent reduction in opioid prescriptions
 - 34.8 percent reduction in average morphine equivalent
 - 50.5 percent reduction in the dangerous combination of opioids plus benzodiazepines
 - 83 percent of controlled substances are electronically prescribed
- ◆ Played a leadership and operational role in the system’s diabetes strategy including:
 - Working with Best Practice to develop and send out letters to patients with uncontrolled diabetes, offering them an appointment with our community medicine clinical pharmacists
 - Helping to develop, implement and promote a diabetes “expanded” huddle for care team resources at community medicine sites

- Collaborating with clinical teams from clinical nutrition, endocrinology and health management to update the system's diabetes competency exams
- Overseeing the Diabetes Care Transformation Committee (DCTC) subgroup around diabetes best practice optimization
- ◆ Embedded the ambulatory neurology pharmacists several days a month in the Memory and Cognition Centers to address brain impairing medications
- ◆ Family practice pharmacists are currently managing over 5,300 of the system's diabetics with outcomes such as:
 - Average reduction in A1c of 1.2 percent in ALL patients referred to clinic
 - Average reduction in A1c of 2.3 percent in patients with A1C>9 at referral
 - Improvement in all diabetic related quality metrics (e.g., hypertension control, statin utilization, nephropathy screening and retinopathy screening)
- ◆ Launched chronic obstructive pulmonary disease management and smoking cessation initiatives across Community Medicine
- ◆ Collaborated with leaders from Community Medicine, Careworks and CareSite Pharmacy to develop and implement an empiric DVT treatment protocol for patients with suspected DVT and awaiting imaging results
- ◆ Implemented Lean initiatives around:
 - Auto arrivals of telephone calls on our clinic schedules which saves clinic assistants' time previously needed for checking these patients in
 - Move of stable chronic anticoagulation calls to Telepharmacy clinical team to free up appointment access at our community medicine sites
 - Streamlined the process for tracking and billing for insulin pumps
- Creation of a monthly report that identifies office visits without a billing code to capture potential lost revenue
- Creation of inbasket messages when patients active within our practices are admitted to the hospital
- Insulin pump billing and documentation protocols
- Addition of MTDM pharmacists as an option for myGeisinger messaging
- ◆ Justin Troutman, Teresa Thomas, Leeann Webster and Gerard Greskovic oversaw the 2018–19 Cardinal Health Best Practices in Pain Management Grant. The grant provided funding and mentorship to 16 health systems across the country implementing innovative approaches to pain and addiction management. As part of this grant, the team organized and facilitated a Pain Symposium in Columbus, Ohio, for close to 100 attendees.
- ◆ Members of the ambulatory clinical pharmacy team presented at several state and national forums such as the American Association of Diabetes Educators (AADE) and the American Medical Group Association (AMGA)
- ◆ Members of the ambulatory clinical pharmacy team had articles published in peer reviewed journals such as the *American Journal of Health System Pharmacy* and *Journal of the American Pharmacist Association*
- ◆ Geisinger at Home highlighted at Pennsylvania Pharmacists Association

Operations & Compliance

New to FY19, the Operations & Compliance pillar spans a wide array of topics and locations within Enterprise Pharmacy.

This pillar is responsible for oversight of many of the operational aspects of the department across the health system. Additionally, we oversee various compliance activities within the department and help to integrate our program into the health system's larger program. Some additional components of our pillar include Medication Safety and Drug Diversion prevention.

Services

Operations – Long-term and short-term operational engagements. We work closely with the local pharmacy leadership to help them facilitate their operational initiatives and help ensure standardization when possible.

Corporate Compliance – Formerly under the Formulary pillar, reviews various external compliance workplans to assess any potential organizational risk. This ranges from 340B program assessment to the billing from our Home Infusion and Specialty Pharmacy services.

Medication Safety – Formerly under the Formulary pillar, oversees individual Medication Safety workgroups at all Acute Care Facilities. Coordinates the Health System's efforts to provide consistent Medication Safety practices. Uses medication incident data to provide any trending to work proactively to prevent future events

Controlled Substance (CS) Diversion Prevention – Works in conjunction with System Leadership for diversion prevention program oversight. Assesses all CS diversion events for trends as well as to share lessons learned with other locations. Develops and monitors CS auditing processes at the acute care hospitals.

Operations & Compliance FY19 by the numbers

- Installation of 85+ automated dispensing cabinets
- 12 active corporate compliance audits
- 4 ongoing controlled substances audits
- Over 50 medication safety process changes

Major accomplishments in the year

Implementation of a decentralized dispensing model and anesthesia work stations at Geisinger Medical Center, Danville

This initiative consisted of installation of over 80 automated dispensing cabinets within both the Nursing units and OR locations. The machines have dramatically reduced the number of medications that must be sent from the pharmacy for immediate patient needs. On the inpatient units, this has led to a ~60 percent reduction in missing medications. In the OR, the cabinets have improved both the accountability and security of controlled substances. The initiative has also led to improved oversight of the entire CS process by allowing for an improved method for auditing Anesthesia staff.

USP 797/800 improvements

Due to regulatory changes in sterile product preparation and handling requirements, over 20 infusion preparation locations required some updating. These changes included both physical layout and capacity upgrades to ensure safe medication preparation. This entailed revising existing work spaces and building new additions to others. These \$10 million dollar upgrades are part of a larger sterile product plan that includes revisions to the management of hazardous medications that will impact a considerably larger staff and patient population. All Pharmacy locations will be equipped with improved storage capability for hazardous medications, especially those that prepare infusional hazardous medications.

Care for Caregiver

Also known as Second Victim program, this program was based on concern about healthcare personnel who experience emotional distress after being involved in an unanticipated adverse event or medical error. Some common feelings experienced at this time include self-doubt, grief, failure, depression, anxiety, guilt, isolation and concern about what will happen next. The program focuses on providing emotional support for caregivers following an event and also provides peer-to-peer support for those in need. There are three tiers of support — local department/unit support, trained peer supporter and expedited referral network, which may include a chaplain, social work, EAP and a clinical psychologist.

FY19 highlights/accomplishments:

- ◆ Expansion of decentralized medication distribution process
- ◆ Installation of anesthesia workstations at Geisinger Medical Center, Danville, Pa.
- ◆ Revision of Pharmacy infusion preparation sites to comply with new USP regulations
- ◆ Expansion of corporate compliance audits to be in line with other health system education
- ◆ Development of second victims' program for staff who are involved in medication errors



Medication Distribution

The Medication Distribution pillar is new to Enterprise Pharmacy for FY19. It was introduced to Enterprise Pharmacy in August 2018 to enhance patient care by creating collaboration and cohesion within the outpatient service line. Integrating components of the Outpatient Services, Infusion and Formulary pillars, the Medication Distribution pillar was designed to encompass outpatient services that have been provided to patients for many years but were historically segregated. These services now include retail pharmacy, mail order pharmacy, specialty pharmacy, home infusion and pharmacy reimbursement.

Medication Distribution FY19 by the numbers

- Collectively, over 940,000 prescriptions filled (500,000 retail, 400,000 mail-order, 40,000 specialty)
- Specialty pharmacy contributed to over \$200 million in revenue
- Secured patient financial assistance funding of \$3.2 million
- VITALine contributed to close to \$20 million in revenue
- Handled 21,212 Epic patient assistance encounters and 2,448 patient assistance applications via Drug Assistant software

Services

Retail and mail order pharmacy – Our outpatient retail pharmacy model offers standard dispensing services as well as clinical services to support our providers and patients and meet the demands of the ever-changing retail environment. Being integrated with our hospitals/medical clinics, our outpatient pharmacy sites not only offer prescription filling, dispensing and pharmacist counseling, but also various other ancillary services to enhance the Geisinger patient experience. We have 12 retail

locations from State College, Pa., to Mount Pocono, Pa. Staff includes 12 pharmacy managers, 20 pharmacists, 46 pharmacy technicians, and 5 service technicians/drivers.

Geisinger opened its mail order pharmacy in Elysburg, Pa., in March 2017, as a system strategy to help reduce costs associated with providing benefits to employees by mandating mail order service for maintenance medications and has since transitioned to its Geisinger Health Plan members. Our mail order facility provides pharmacy delivery to patients in 9 states: Pennsylvania, Delaware, New Jersey, New York, Ohio, Florida, Indiana, Wisconsin and Maine. Staff include 1 pharmacy manager, 5 pharmacists, 16 pharmacy technicians, 2 pharmacy associates and 1 pharmacy buyer. Currently, our mail-order fills approximately 1,700 prescriptions a day and triages 350 to 400 calls a day, on average.

With the conversion of our retail locations to the same pharmacy software that is supported by CareSite Mail Order, we have been able to increase our overall volume of prescription fills, transfer patients from retail to mail order to increase patient utilization, increase patient compliance and increase system savings and provide additional clinical services offered at our retail locations. Collectively, our retail and mail order pharmacy served over 100,000 patients in the last year.

Specialty pharmacy – Specialty pharmacy operates one closed-door pharmacy on the Geisinger South Wilkes-Barre campus, shipping throughout Pennsylvania, in addition to New York, New Jersey, Ohio, Delaware, Maine, Florida, Connecticut, and Indiana. Our clinical focus is in the areas of multiple sclerosis, hepatitis C, hematology/oncology and autoimmune diseases. Staff include a director, manager, clinical coordinator, 5 clinical pharmacists, pharmacy technician supervisor, 12 pharmacy technicians, 2 pharmacy assistance coordinators, 2 pharmacy support associates and 1 service technician.

Attaining URAC specialty pharmacy accreditation in January 2017 has opened the door to limited distribution drug access and an ability to provide for many payer networks. It has also paved the way for recognition of our high-quality services. We continue to provide patient management programs, which are detailed patient assessments completed by trained pharmacists at the beginning of each patient's treatment, and scheduled reassessments throughout therapy, including monthly patient refill assessments and episodes of care tracking. We operate a robust Quality Management Program including a clinical oversight committee and ongoing quality improvement projects. Our patient financial assistance services help to identify financial barriers to critical treatments and research and obtain all available financial assistance for underinsured patients and those with high out-of-pocket costs, leading to \$3.2 million of financial assistance awards in FY19. Finally, we offer high touch personalized care, accommodating patient choice of delivery and arrival dates, high-risk stratification processes, prescription refill management and prior authorization tracking and assistance. Over the last year, Specialty Pharmacy has seen an increase in prescription volume by 34 percent, leading to an increase in staff.

VITALine home infusion – VITALine has provided quality infusion services to our community in more than 40 counties in Pennsylvania since 1988. In July 2018, they transferred from Geisinger Community Health Services to Enterprise Pharmacy to continue the effort to unify all pharmacy services and serve patients in the best possible manner. VITALine is staffed with 76 employees, including 7 pharmacists, 16 pharmacy technicians, 19 registered nurses and a dietician.

VITALine currently serves 3,325 patients for therapies in total parenteral nutrition, antibiotics, enteral, chemotherapy and other miscellaneous therapies (e.g., pain, hydration, steroids) with a total expected revenue of close to \$20 million in FY19. Over the last year, VITALine started providing nursing

services in the home, which had previously been subcontracted out. This service will allow for higher-cost medications to be infused in the home instead of in the clinic or hospital setting, increasing patient satisfaction and compliance, and freeing up hospital beds.

Pharmacy reimbursement – Pharmacy reimbursement services include: enrolling qualified, eligible patients into free drug programs sponsored by pharmaceutical manufacturers' Patient Assistance Programs (PAPs); enrolling qualified, eligible patients into Foundation and Grant programs that are based on diagnosis code benefiting Medicare patients; identifying financial barriers and investigating available assistance; assisting with PACE and PACENET enrollments for qualified Pennsylvania residents; reviewing and obtaining all drug and disease-specific assistance programs for un-insured, under-insured, and those with high out-of-pockets (OOP) costs and enrolling commercial insured patients into pharmaceutical manufacturer copay card programs. The team includes Pharmacy Reimbursement Coordinators (PRCs) located on the GMC, GCMC and GSWB campuses in addition to Oncology PRCs embedded in oncology clinics at GWV Henry Cancer Center, GMC Knapper Clinic, GCMC Infusion Center and the Geisinger Selinsgrove clinic. Staff includes a director, manager and 9 pharmacy reimbursement coordinators, with 5 pharmacy reimbursement coordinators handling all Geisinger hospitals and clinics with the exception of Hematology/Oncology and 4 pharmacy reimbursement coordinators designated to specifically handle the coverage for Hematology/Oncology patients.

Over the last year, the team has experienced an increase in referrals, patient calls and staff messages due to the expansion of the Refill Call Center, GHP Community Health Assistants and the overall need for medication assistance by patients. The team has secured Patient Assistance Funding in excess of \$10.5 million dollars and has added staff.

FY19 highlights/accomplishments:

◆ Retail and mail order pharmacy

- Redesigned and expanded the MyBedsideRx program to now include Geisinger Medical Center, Geisinger Wyoming Valley Medical Center, Geisinger Lewistown Hospital and Geisinger Gray's Woods
- Converted the remaining 8 retail locations to the new pharmacy software platform, joining the original 4 locations
- Added another robot and packing station to mail order pharmacy, allowing for 1,000 additional prescriptions to be filled per day
- Introduced blister packaging at the Lewistown and Mount Pocono clinics, with expansion of this service anticipated for FY20
- LIFE Geisinger, a long-term care service, expanded to CareSite Belleville, joining Dallas and Pottsville in providing medication boxes to these patients
- Partnered with Geisinger at Home to stock and replace medications for in-home treatment of patients
- Partnered with Geisinger's marketing team to create a campaign promoting our retail and mail order pharmacy services

◆ Specialty pharmacy

- Converted pharmacy software to hosted pharmacy management system, McKesson EnterpriseRx®
- Participating pharmacy in the MedImpact Direct Specialty™ pharmacy network for Geisinger Health Plan
- Providing specialty pharmacy services to all Geisinger employees

◆ VITALine home infusion

- Established and revised Client Agreement to eliminate unnecessary paperwork including annual agreements. A version also available in Spanish.

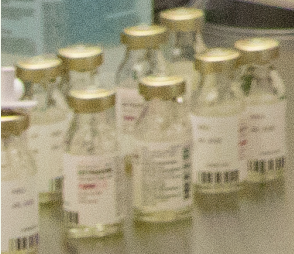
- Established various workflow efficiencies, including team huddles and warehouse and receiving purchasing processes
 - Implemented a gravity bag kit to assist with meeting delivery needs
 - Reached 90 percent centralized supply ordering, which will save on shipping costs
 - Increased education to our patients on side effects of home infusion medications
 - Pump maintenance – Need to track issues with pumps
 - Chemo spill kit – Back order/decrease cost
- ### ◆ Pharmacy reimbursement
- Expansion of patient assistance services to specialty clinics to provide overall coverage review, including medical VS pharmacy benefit options by collaborating with the My-Visit team to provide the best financial option for our patients
 - Handling of patient-supplied medication ordering by pharmacy reimbursement coordinators at defined clinic locations and continued expansion of ordering sites
 - Implementation of Drug Assistant web-based software to improve the efficiency of enrolling patients into medication assistance programs
 - Collaboration with 340B team to implement Macro-Helix Sample Program
 - Creation and implementation of Patient Medication Alert in Epic that triggers a Best Practice Alert to fire when a patient supplied medication needs to be dispensed vs clinic stock; this alert has decreased the number of charge corrections due to credits and inaccurate billing
 - Partnered with Geisinger Commonwealth School of Medicine's program "Let's Talk About Change – Prescription Affordability" in May 2019; provided medication assistance information at the event



EdgeGARD HI

BIOSAFETY CABINET
TYPE II CLASS II
SERIAL NO. 11111111
DATE OF INSTALLATION
DATE OF INSPECTION
INSPECTOR'S NAME

THE OPERATOR SHOULD
REPLACE THE FILTERS
WITH NEW 1.1 MICRONS
PARTICULATE FILTER
PERIODICALLY FOR
OPTIMAL AIRFLOW



Contracting & Procurement

Formerly called the Formulary pillar, the Contracting & Procurement pillar was renamed and restructured in August 2018 to include formulary, procurement/inventory management and contracting.

Services

Formulary – The role of the Formulary team is to work with our clinician partners to evaluate pharmaceutical products using an evidence-based approach to identify which products provide the best outcomes to our patients. Once identified, the team works with pharmaceutical vendors to negotiate the best possible price for these products.

Procurement/Inventory Management – The Procurement team works hand-in-hand with the formulary team and communicates daily with the acute care hospitals and ambulatory clinics to ensure that pharmaceutical products are readily available for patients.

Contracting – The Contracting team is responsible for evaluating potential contract opportunities with vendors that will result in partnerships with pharmaceutical companies. The team consists of members from across the Pharmacy enterprise, inclusive of Geisinger and Geisinger Health Plan. These partnerships lead to cost savings opportunities.

Major accomplishments in the year

Formulary changes in the airway disease space

By having a closed system formulary, Geisinger is able to control expense and cost of prescription medications, and at the same time standardize what medications are available across all of the acute care hospitals and ambulatory clinics. By partnering with other pharmacy pillars, such as Managed Care, we have implemented many formulary changes that are beneficial to the organization and our patients.

Contracting & Procurement FY19 by the numbers

- Annual savings of over \$400,000
- Completed 36 new drug reviews, 29 expanded indication reviews and 9 class reviews

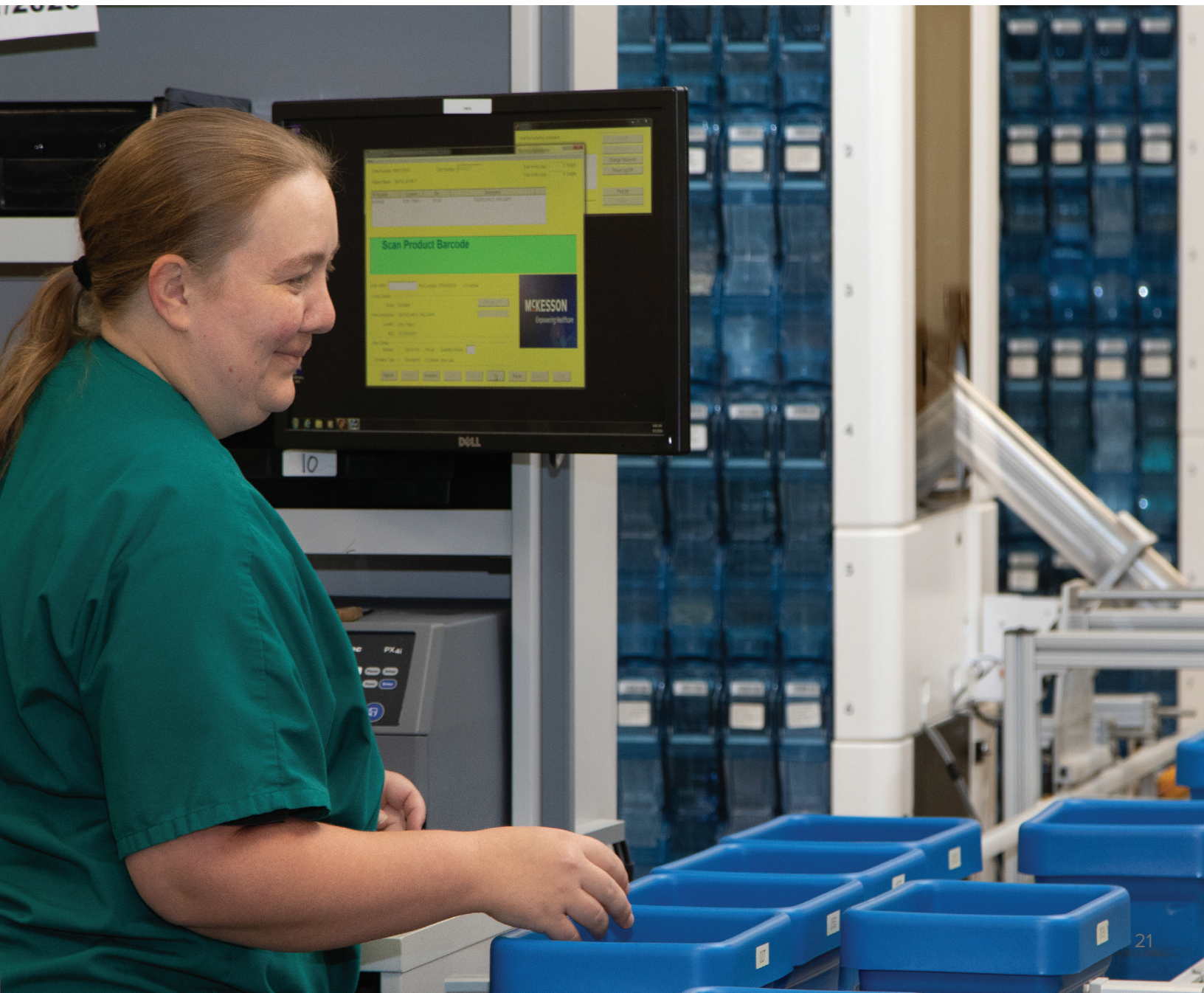
Centralized Logistics and Material Warehouse (CLAM)

In 2018, supply chain inventory, including medications, started to relocate to the CLAM in Elysburg, Pa., to take advantage of direct shipping opportunities as well as maximizing inventory control. This was a large effort and involved staff from Procurement, Logistics, Supply Chain, and Pharmacy. This move allowed us to obtain inventory reduction and carrying cost avoidance of over \$190,000 in FY19 for the health system. Over the next fiscal year, we plan to continue to maximize our inventory control for centralized distribution.



FY19 highlights/accomplishments:

- ◆ The Formulary Steering Committee completed a total of 36 new drug reviews, 29 expanded indication reviews and 9 class reviews.
- ◆ Formulary changes in the airway disease space led to annual savings of over \$400,000.
- ◆ Received a Geisinger System Services Pharmaceutical Distribution Center Registration from the Pennsylvania Department of Health. The Pharmaceutical Distribution Center will be located at the CLAM. This is an important step in helping to maximize control of purchasing, inventory, and distribution of medications.
- ◆ Process began for relocating inventory to the CLAM in Elysburg, Pa., and we were able to obtain Inventory Reduction and Carrying Cost Avoidance of over \$190,000.
- ◆ With the development of multiple biosimilars being created and FDA approved in the WBC stimulant class, the Pharmaceutical Contracting Team worked closely with pharmaceutical manufacturers to contract for the best price once a clinical evaluation was completed. During FY19, over \$120,000 savings has been obtained so far.



Center for Pharmacy Innovation and Outcomes

The Center for Pharmacy Innovation and Outcomes (CPIO) was established in the fall of 2015 in partnership with Enterprise Pharmacy and Research as a dedicated unit to formally evaluate pharmacy services and medication use within the system and disseminate learnings to external audiences. Our team is comprised of full-time and clinician faculty, project managers, research assistants, analysts, and an investigational drug pharmacist. Leveraging Geisinger's rich culture of innovation, fully integrated and archived electronic health record, large genomic database, long-term patient cohorts, integrated system-level pharmacy services and embedded pharmacy researchers, we are able to study real-world problems and develop and test innovative solutions. We continue to operate under the vision of becoming a world leader in healthcare research through the evaluation, implementation and dissemination of safe, responsible, sustainable and patient-centric use of medications. Our goal is to rigorously test innovations in the real world to improve the medication use system. We deploy a multitude of research methodologies to accomplish this and disseminate our findings through a multitude of venues, including peer-reviewed publications. Our focused efforts include support for investigational drug services, acting as a principal research resource to pharmacists and residents, developing and conducting real-world medication-focused outcomes studies, demonstrating effectiveness of pharmacy programs, developing and testing innovative solutions to medication-related problems, and assisting the clinical enterprise in translating research learnings into practice.

The CPIO intersects with Enterprise pharmacy across all pillars and manages projects in a multitude of health conditions including oncology/hematology, addiction medicine, pain, diabetes, depression, hyperlipidemia and cardiovascular disease, among others. In addition, the CPIO partners with pharmacy practitioners in evaluating practices in acute, ambulatory, transitional and telehealth practices. For example, in our Geisinger at Home program, the CPIO partnered with this new team to implement and evaluate comprehensive medication management services provided remotely by pharmacists. An excerpt of this is included in this report.

CPIO FY19 by the numbers

- 14 faculty, practitioners and staff
- 29 peer-reviewed publications and other scholarly works
- Over \$1.6 million in project revenue from research grants

Research Influence on Clinical Enterprise

- Investigational drug services
- Pharmacy research study support
- Conducting medication outcome studies
- Demonstrating effectiveness of pharmacy programs
- Testing technology innovations in the real-world
- Translating research into practice



Major accomplishments in the year

Scholarly activity

The CPIO has had another successful year. We authored over 29 peer-reviewed publications on topics such as safe and appropriate pain management, transitions of care, shared decision making and pharmacist services. We also shared our successes in various venues including national and international meetings, continuing education lunches, television and other media.

Grants

Jove Graham, PhD, was awarded a grant from Medtronic to study variations in various data models on format of electronic health information. The CPIO was awarded two Geisinger Health Plan Quality grants to begin in July 2019 with a 2-year duration. The first, being led by Michael Gionfriddo, PharmD, PhD, will evaluate the medication reconciliation processes within the ambulatory care settings and provide a plan to improve accurate medication list accuracy, and the second, led by Eric Wright, PharmD, MPH, will assess the impact of using education, reminders and disposal options to patients on unused medications in the home.

Research projects

Transitions of care from inpatient to community pharmacies

In partnership with colleagues in acute, ambulatory and the informatics pillars, the CPIO completed a 5-year relationship with the NACDS Foundation to evaluate the impact of inpatient to community pharmacist communication on adherence and readmissions among high risk patients. When given a structure to transmit this information, we found that community pharmacists are actively engaged with patients and caregivers at regular intervals, providing recommendations to providers and patients regarding medication adherence, vaccinations and disease monitoring. In fact, these interactions resulted in lower 30-day readmissions and a significant return on investment on health care utilization and total costs of care. Three studies were published in 2019 in the *Journal of the American Pharmacist Association*, the *Journal of Pharmacy Practice* and the *Journal of the American College of Clinical Pharmacy* from these efforts (see publications for references)

Transmitting device information to payers

Despite the familiarity of payers collecting exact prescription information (i.e., NDC) from pharmacies, and codes for procedures and diagnosis from providers on a regular basis, the transmission of unique device identifiers to payers/insurances did not occur in the United States until Dr. Jove Graham and others here at Geisinger and his collaborators from Harvard Pilgrim demonstrated successful transfer of device identification codes automatically using a claims transmission form. Funded by the Patient-Centered Outcomes Research Institute, Dr. Graham and colleagues demonstrated this using already available data exchange standards, making this a potentially highly transferrable and generalizable feat. A study published in the *Journal of Patient Safety* describes the innovation and is available in our publication section.

FY19 highlights/accomplishments:

- ◆ Over \$550,000 received in new grants and contracts
- ◆ 29 peer-reviewed publications
- ◆ Landmark publications in AJHP, JAPhA, BMJ and the Harvard Business Review
- ◆ Presented at national (e.g., HIMSS, ASBMT) and international (e.g., ASTM) meetings
- ◆ >20,000 pounds of medication have been collected since 2014 in our continuous medication collection kiosks located in 38 pharmacies, hospitals and law enforcement locations
- ◆ >44,000 investigational drug doses facilitated
- ◆ Formed the research subcommittee of the System Diabetes Care Transformation Committee
- ◆ Formed the Pharmacy Residency Research Subcommittee for support of residency research projects
- ◆ Mentored 9 medical and pharmacy students and 15 medical and pharmacy residents. Faculty also taught classes at Wilkes University, Bucknell University and Geisinger Commonwealth School of Medicine.
- ◆ Along with others in Enterprise Pharmacy, awarded the Innovation in Pharmacy Practice award at the 2018 ASHP mid-year meeting
- ◆ Michael Gionfriddo, PharmD, PhD, received the New Investigator award at the Healthcare Systems Research Network meeting in Portland, Ore., for his work on MedTrue™
- ◆ Jove Graham, PhD, promoted to associate professor following promotional review

Managed Care

Under a separate entity from Geisinger's Clinical Enterprise, key functions of the Geisinger Health Plan (GHP) Pharmacy Services Department include operational oversight of our claims processor and setup of prescription drug benefits, formulary development, a P&T Committee consisting of internal and external members, prior authorization and reporting. The department consists of over 50 employees and includes pharmacists, pharmacy technicians, data analysts, benefit analysts, operations coordinators, prior authorization representatives and others. GHP offers nearly every type of medical and prescription drug insurance including commercial risk, ACA Marketplace, self-insured, self-insured Rx-only, Medicare Advantage Part D, Pennsylvania Medicaid and Pennsylvania CHIP. GHP has prescription benefit clients in Pennsylvania, New Jersey and Maine.

Managed Care FY19 by the numbers

- Processed over 9.7 million pharmacy claims at a cost of over \$800 million. When you add in medical benefit drugs, the health plan paid over \$1 billion in medication claims for our members.
- 53 employees, including pharmacists, pharmacy technicians, data analysts, benefit analysts, operation coordinators and prior authorization representatives.

Major accomplishments in the year

Addressing the opioid crisis

GHP joins Geisinger in its commitment to fight the opioid epidemic. We put many claims edits in place to help reduce the number of morphine equivalent doses our members are receiving. Across all lines of business, we saw a 37 percent decrease in opioid utilization. At the same time we saw a decrease in opioid utilization, we saw an increase in the use of buprenorphine products to help treat those addicted. Utilization management criteria were removed from Suboxone, Subutex and their generic equivalents to make access to the medications faster and easier.

MedImpact Direct Specialty

On Jan. 1, 2019, GHP moved to the MedImpact Direct Specialty (MIDS) Network. The MedImpact Direct Specialty program is a narrow network of best in class specialty pharmacies that are able to comply with all the terms and conditions of the program. The terms and conditions are stringent and contractual in order to deliver high quality care, clinical support, data and reporting, as well as cost savings. Not only do our members get a better quality of care with the MIDS network but in the first quarter of 2019, the network saved GHP \$4.3 million.

FY19 highlights/accomplishments:

- ◆ Partnered with a vendor to allow Synagis to be administered in the home, thereby keeping premature babies who are more susceptible to illness out of doctors' offices
- ◆ Partnered with marketing to increase members' awareness of mail order pharmacy
- ◆ Reduced opioid utilization
- ◆ Improved access to Suboxone, Subutex and their generics by removing prior authorization to aid in speed and access to addiction products
- ◆ Collaborated with our clinical partners to implement and install CenterX, the electronic prior authorization system selected by Geisinger
- ◆ Implemented a new specialty network, MedImpact Direct Specialty
- ◆ Implemented a Choice 90 program for Medicaid members, which requires members to get a 90-day supply of maintenance medication at either a retail or mail order pharmacy
- ◆ Collaborated with internal partners to put a process in place to reduce the health plan's exposure to paying for claims when an Exchange member is in their "grace" period and hasn't paid their premium
- ◆ Continued to increase number of specialty and 90-day prescriptions filled at our Geisinger retail/specialty/mail-order facilities, decreasing costs to our members and proven to increase member adherence to medications. Based on recent data, Medicare members who use mail order for cholesterol, diabetes and hypertension medication have a higher adherence rate.



Clinical benefits		
Measure	% of members over 80% PDC	
	Not utilizing CareSite Mail-Order	Utilizing CareSite Mail-Order
Cholesterol	91.4%	95.4%
Diabetes	89.1%	94.7%
Hypertension	92.1%	96.0%

Informatics & Strategy

The Enterprise Pharmacy Informatics & Strategy pillar serves to support all the software and technology-related functions within the pharmacy department. As the responsibility and scope of Enterprise Pharmacy continues to develop and grow, so does the scope and responsibility of the pharmacy informatics team. The team currently consists of 2 pharmacist informaticians, 5 informatics pharmacists and 2 informatics analysts and is led by the AVP clinical informatics.

Although involved with and responsible for a number of different areas and systems, the key areas of responsibility and development of the team over the last year have focused on the support and development of the electronic health record (EHR) and support and expansion of the automated dispensing cabinets (ADCs) including the installation of 52 new anesthesia cabinets at Geisinger Medical Center, Danville, along with planning for the installation of those same cabinets across the rest of the health system. Other key areas of focus included conversion of Geisinger Jersey Shore Hospital to the Epic EHR in the beginning of the year, providing support to two upgrades to Epic over the course of the year and supporting the upgrading of a number of systems as they move from the Windows 7 to the Windows 10 platform, in order to prepare for Microsoft's sunsetting of the Windows 7 product. This project will include the need to upgrade the hardware for the entire fleet of automated dispensing cabinets across the organization. The informatics team is also responsible for the IV pumps databases and software. Three of the pump software systems were upgraded over the past year, and standardization and expansion of the drug library was a key ongoing process as we prepare for the integration of the pumps with the EHR.

Key to the plan and functionality of the informatics team is an ongoing emphasis on patient safety and workflow. Over the last year, the 2 pharmacist informaticians were added to increase our ability to identify workflow issues and develop processes within the EHR to improve the workflow and efficiency for pharmacists, nurses and providers. Pharmacist informaticians will go onsite with the front-line personnel to determine the workflow needs and address potential improvements and solutions.

Informatics & Strategy FY19 by the numbers

- Team of 10 employees, including pharmacist informaticians, informatics pharmacists, informatics analysts, and an AVP
- Supported the installation of 52 new anesthesia cabinets at GMC
- Reviewed over 100 inpatient order sets

Major accomplishments in the year

Committee to update inpatient order sets

Key areas of improvement over the past year include the implementation of a committee of clinical pharmacists and pharmacy informatics staff responsible for reviewing and updating the over 3,000 existing inpatient order sets. This committee meets weekly to address current issues and review all new order sets prior to them becoming available within the EHR. The committee has reviewed hundreds of order sets over the past year and continues to actively pursue the goal of reviewing all existing order sets at least every 3 years.

Software to support electronic prior authorization

Another key informatics project was implementation of software that integrates with the EHR to support electronic prescription prior authorization (ePA). This allows for identification of medications that require prior authorization and support for the prior authorization request and management from within the EHR. Historically this process has been carried out either on the phone or outside the EHR via the internet. Electronic prescription prior authorization offers the advantage of carrying out the entire transaction within the EHR and supports the electronic gathering of discrete data from within the EHR that is needed to support the prior authorization request. Communication for additional information or decisions regarding the prior authorization request all occur within the EHR, expediting the process and streamlining the documentation and management process. To date, the entire Community Medicine service line is live on the ePA, and a process to roll out ePA across all the specialty areas is in the works. The system currently supports at least 1,000 electronic prior authorizations per week, with a decrease in the average time to complete the prior authorization from about 8 days to approximately 3 days.

Moving forward, key projects for the next year

include:

- Expansion of the anesthesia workstations to all the surgical areas of the organization
- Completion of the ePA project to cover all service lines
- Implementation of software to support the pharmacist managed prescription refill project
- Implementation of software to support the shortage management process
- Support the conversion of Evangelical Hospital to the EPIC EHR
- Conversion of all ADCs to the Windows 10 compatible version
- Implement decision support within the EHR to address all FDA REMS requirements

FY19 highlights/accomplishments:

- ◆ Integration of the Pennsylvania Prescription Drug Monitoring Program (PDMP) into the electronic health record
- ◆ Reviewed over 100 inpatient order sets available in the electronic health record
- ◆ Implementation of software to support electronic prior authorizations, resulting in 1,000 electronic prior authorizations a week
- ◆ Supported the installation of 52 new anesthesia cabinets at GMC
- ◆ Supported the conversion of Geisinger Jersey Shore Hospital to Epic
- ◆ Provided support of 2 Epic upgrades
- ◆ Supported the upgrade of Windows 7 to Windows 10
- ◆ Upgraded 3 IV pump software systems

Highlighted programs and initiatives

Geisinger's 340B drug pricing program

340B in action

The 340B Drug Pricing Program was created to financially supplement hospitals that provide a high level of care and services to low-income people or those in isolated rural communities. This program allows safety-net providers to support critical health services for our communities. The program provides for the purchase of ambulatory medications at discounted prices, and the savings from the program help us maximize scarce federal resources and meet the healthcare needs of the communities most underserved patients. It is important for Congress to preserve and protect the 340B program, as it does not rely on taxpayer dollars and is an essential component of the safety net.

340B program overview

During 2018, Geisinger Medical Center, Geisinger Wyoming Valley Medical Center and Geisinger Jersey Shore Hospital all participated in the 340B program. Geisinger Lewistown Hospital now qualifies and was added in April 2019. Geisinger Community Medical Center also qualified and was added to the program in July 2019. The program is managed by HRSA and has significant requirements for the ongoing monitoring, management and auditing of the program. The 340B team currently consists of 4 full time members plus support from analytics, purchasing and pharmacy informatics to maintain the program and ensure compliance with appropriate HRSA regulations. In addition to the program's expansion to a total of five hospitals, the program continues to analyze opportunities to partner with pharmacies that fill sustention numbers of prescription from the covered hospitals, to expand the impact of the program as it contributes to the amount of community support provided to Geisinger patients.

340B's impact in our community

Healthcare is really people caring for people. Geisinger has earned a national reputation for quality, value, innovation, education, research and compassionate care. Here are just some ways the 340B program helps Geisinger care for our vulnerable patient population, increase services and stretch federal resources.

- **Medication Therapy Disease Management Program** – Our internationally recognized initiative connects pharmacists to patients who need personal guidance about medications for conditions including anticoagulation, hypertension, diabetes, cancer and chronic pain, empowering patients to meet treatment goals more easily.
- **Fresh Food Farmacy®** – Partnering with the community, we are improving the health of adults with diabetes by providing them with free, nutritious food and comprehensive medical, dietetic, social and environmental services. Our Fresh Food Farmacy has had clinical impacts greater than those of expensive medications at a significantly lower cost.
- **MyCode® Community Health Initiative** – With more than 200,000 patient-participants, MyCode is delivering medically relevant results to participants and their primary care doctors. More than 500 people have received clinical reports telling them they have a genomic variant that increases their risk of early cancers or heart disease, so their doctors can detect and treat these conditions before symptoms arise. This important initiative helps us keep our patients well.

- **Senior transportation project** – We are conducting a pilot program in Danville that provides transportation for seniors to and from their medical appointments. The goal is to improve access to care, making patient follow-up easier and improving health outcomes.
- **Diabetes Prevention Program** – The National Diabetes Prevention Program meets about once a week for the first 6 months, followed by 6 monthly sessions. Trained lifestyle coaches help participants lose weight, increase physical activity and learn how to make healthy choices. Participants are given support to reduce their risk or delay the onset of Type 2 diabetes.
- **Better Breathers Club** – The Better Breathers Club meets monthly with guest speakers and educational sessions. Those with chronic lung disease, such as COPD, asthma or pulmonary fibrosis, benefit from free education, resources and group support to learn to better manage their disease.
- **LIFE Geisinger** – This unique, innovative program is designed specifically for older adults to support their desire to live at home. The LIFE Geisinger program can help people continue to live independently while taking advantage of comprehensive daily living and health services. The coordination of care for patients is provided by the Geisinger team with no gap in services.

340B by the numbers

- In FY19, we had \$83.3 million in 340B savings, which contributed greatly to our ability to provide uncompensated care for people in need. This number has risen to over \$146 million in FY19.
- Geisinger provided \$856.7 million in community support in FY17 in the form of:
 - Free, uncompensated care to patients who could not afford to pay
 - Care provided to the elderly and the poor not paid by Medicare or Medicaid
 - Allied health, medical education, medical residency and fellowship programs
 - Healthcare research
 - Community health, education and outreach programs



Pharmacy's involvement in the integration of electronic prior authorization/Center X

Geisinger's process for requesting, documenting and notification of prior authorizations was disjointed. Knowing when and how to request a prior authorization for a patient created hardships for clinicians and medical office staff as the need for and requirements were determined by health plans and were not universal across them. Thus, the continuum of care was broken for many patients when they arrived at the pharmacy to pick up a medication, only to discover it had not been approved by their insurance company, resulting in a delay in their care. Additionally, the request forms for every insurance company differed on information that was necessary for approval. Without an integrated system, someone in the medical office had to look up the proper form for that insurance company, document all the fields by hand and receive sign-offs by the ordering provider.

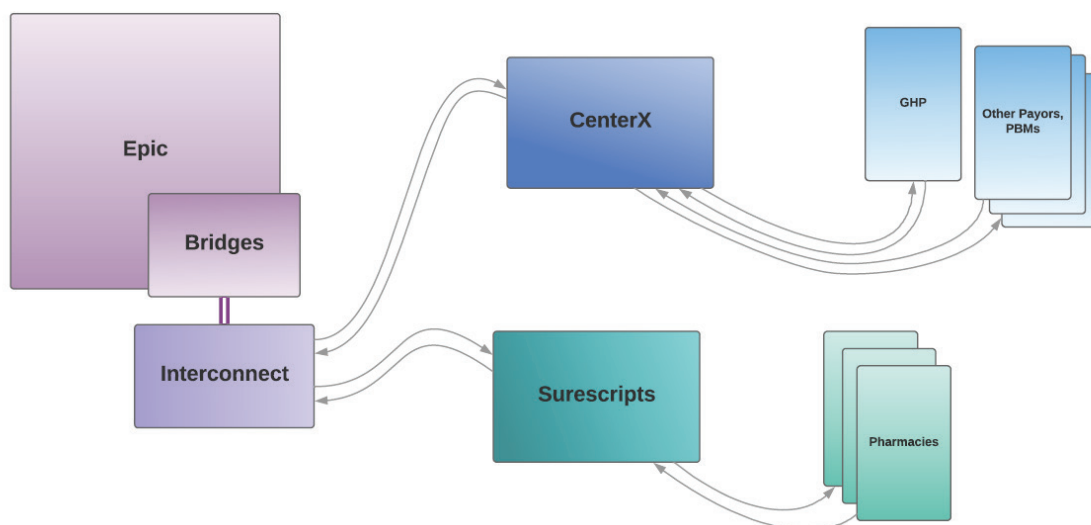
Prior authorization documentation for the health plan was also an issue. Many times, prior authorization requests were received without the needed documentation for the health plan to approve the request. An electronic process to streamline the required information was needed to move away from the inefficient manual process.

A multidisciplinary team was brought together to find a solution for both the system side and the health plan side. The team identified that electronic prior authorization was the ideal solution and began reviewing vendors to meet the health system's needs. Center X was the vendor of choice based on its ability to integrate with Epic and the current GHP prior authorization system.

Center X is a product that enables electronic prior authorization transactions for Pharmacy benefits during the Epic Medication Order Entry process. This allows the provider to remain in their normal workflow while identifying medications that need a prior authorization.

For Pharmacy benefit payers with ePA capability (most), this will replace the paper/faxing/phone call inefficiencies in Geisinger practices.

The Center X system is designed to work with Epic to allow the required prior authorization information to be managed online via Epic InBasket messaging. This allows employees to incorporate the technology within their current workflows. Center X also manages and maintains the prior authorization within the medical record.



The project team came together to analyze current workflows and determine how to best implement the Center X within the various Geisinger sites. Excellent training handbooks, GOALS courses, recordings and fast facts were developed by pilots to offer to new sites. The team continues to enhance and improve training as issues are encountered.

The Center X installation includes requirements for providers to enter associated diagnoses if a

medication order requires pharmacy benefit prior authorization. The system authorization history is held within the patient medication record on Epic.

Installation began with a pilot at 9 Community Medicine sites. The successful pilot led to the rollout across the entire Community Medicine network. Work is currently underway to facilitate the analysis and implementation at specialty care sites with the initial go-live being in Neurology.

Telepharmacy's clinical hub

Telepharmacy is proud to be celebrating its second anniversary this August. During FY19, the department of 4 pharmacists and 8 pharmacy technicians rapidly expanded to a team of 21 pharmacists and 30 technicians. As the platform grew, the scope of practice also evolved from managing prescription refills for the Community Medicine Service Line (CMSL) to involvement in multiple systemwide clinical initiatives. The Telepharmacy platform was initially piloted with one CMSL site and is now serving 50 primary care locations sites and approximately 300 providers. Overall, the team is now responsible for two-thirds of all medication-related in-basket volume in primary care and is completing about 65,000 medication requests per month.

In November 2018, as the team was in the midst of scaling the medication refill service across the entire CMSL service line, the platform was realigned under the Ambulatory Disease Management pillar within Enterprise Pharmacy. As a result of the merger with the Medication Therapy and Disease Management (MTDM) platform, the former Pharmacy Refill Call Center evolved into Telepharmacy and began development of its clinical hub.

Anticoagulation was selected as the pilot clinical initiative based on the large volume of telephonically managed patients enrolled in the established MTDM Anticoagulation Clinic. Currently, 4 pharmacists at Telepharmacy have been credentialed in anticoagulation management through the Geisinger training program, with the remaining 17 pharmacists working toward certification. In addition to pharmacists, 4 pharmacy technicians underwent specialized anticoagulation training to allow them to communicate treatment plans to patients.

The Telepharmacy anticoagulation management service was implemented within the northeast region in January 2019 and is currently being scaled across all ambulatory pharmacy locations systemwide. Since the clinical service was piloted, Telepharmacy has completed 6,601 anticoagulation encounters while maintaining the exceptional quality that has been historically provided by our anticoagulation program. With the telephonic management now being housed at Telepharmacy, more time is available for the MTDM pharmacists working in clinics to see patients face to face for both anticoagulation and chronic disease management.

Hepatitis C transplants: Improving access through unconventional means

With the improvement in transplant outcomes, the number of patients on the waiting list for an organ has increased, causing the gap to widen between individuals anticipating transplant and the number of organs available. In the recent past, numerous available organs went unused due to concern for infection with hepatitis C virus (HCV). However, with the advent of direct acting antivirals for the treatment of HCV, which have a proven cure rate of greater than 95 percent, HCV-positive transplants are on the rise across the country.^{1,2} At Geisinger, we have performed over 74 kidney/liver transplants with donor organs positive for HCV since initiation of the program on July 5, 2017. To ensure positive outcomes in the transplant recipient, a protocol was developed for appropriate testing, and treatment when necessary, to eradicate the virus in the recipient if transmitted.

Since the recipients who develop HCV infection post-transplant have an additional new medication added to their already complex anti-rejection regimen, the inpatient transplant pharmacists and ambulatory care hepatology pharmacists have joined forces to provide exceptional care for these patients. Education regarding their new medications is provided and drug interactions are managed prior to discharge. Once prior authorization is approved, the HCV medication is dispensed from CareSite Specialty Pharmacy, whenever possible, where the cost of the medication to the patient is minimal thanks to funding available through government grants or manufacturer's copay cards. Close follow-up is accomplished telephonically to ensure adverse events are ameliorated, refills are received and the necessary blood work is completed to ensure a cure

is achieved 12 weeks after completion of treatment. Since the first patient received an HCV viremic organ in October 2018, there have been 38 additional patients that have completed or are undergoing treatment through the ProvenCare hepatitis C model at this time.

By utilizing this strategy to overcome organ shortages, we have noticed a drastic growth in the number of transplants performed, including patients living outside of Geisinger's reach in central and northeastern Pennsylvania; some of the recently transplanted patients live in New York state. Until this unique approach becomes the standard of care, Geisinger remains a leader in the state of Pennsylvania providing the option for HCV-positive transplants, therefore shortening the wait time and improving patients' quality of life.



1. Selzner N and Berenguer M. Should organs from hepatitis C-positive donors be used in hepatitis C-negative recipients for liver transplantation?

2. Halter C. Hepatitis C-positive organ transplants are on the rise. *Hep*. September 7, 2018. Available at: <https://www.hepmag.com/article/hepatitis-cpositive-organ-transplants-rise>.

Hematology/Oncology Pharmacy

The Hematology/Oncology (Hem/Onc) Pharmacy practice has made significant strides this past year with the Hem/Onc redesign project in collaboration with the Geisinger Cancer Institute. Our dedicated team of pharmacists and pharmacy technicians serve to support clinical and infusion services for various adult and pediatric cancer populations across several platforms. Areas supported include inpatient and outpatient infusion services, medication therapy disease management, clinical research, beacon informatics and bone marrow transplant. In addition, the GMC Hem/Onc team of pharmacists serve as preceptors for the only PGY2 specialty residency program within the health system.

The FY19 keyword for the Hem/Onc group has been “standardization.” The Enterprise Pharmacy leadership team, in collaboration with the Cancer Institute, laid the foundation for standardization with the Hem/Onc Clinical Redesign project. This entailed a current and future state analysis of Hem/Onc pharmacy across the entire health system. As part of this redesign project, patient access to services has increased by moving certain inpatient chemotherapy regimens to the outpatient setting in collaboration with VITALine. Protocols were developed, and staff trained for pharmacy-based dose adjustments as pharmacists stepped up to serve in a larger capacity as physician extenders. This has fueled the growth in the pharmacy technician roles as the Hem/Onc technicians across the system started to step out of the traditional roles and aspired to practice at the top of their license. The streamlining and standardization of practices and workflow has further promoted cross-coverage of pharmacists and technicians to accommodate the staffing needs across the regions. Further, load balancing of resources based on demand and volume analysis has led to the development of a more centralized model for staffing and clinic support with direct, positive impact on the staffing structure as well as on the USP 800 renovations budget. The redesign efforts

also merged the MTDM, inpatient and outpatient services, leading to increased collaboration across the specialties within the service line.

The Northeast Region saw a shift in the Hem/Onc staffing structure, with the opening of the GSWB Hem/Onc pharmacy providing clinical and distributive services to second-day treatment clinics in the Northeast and Central regions. As part of the redesign, pharmacists from the Northeast Region made significant contributions specifically in the areas of increased patient access, development of chemotherapy guidelines, implementation of USP 800 requirements and optimization of Beacon protocols. Adoption of more structured clinical coverage by Hem/Onc trained and certified staff in the northeast has enabled the pursuit of expertise and in-depth engagement in standardizing operations and interdepartmental collaborations.

FY19 saw the Western Region take the lead in cross-regional support, with technicians from the west providing much-needed staffing support for the Central Region to minimize interruptions in patient care. Much effort was placed into the training and development of experienced Hem/Onc pharmacists and technicians, leading to increased clinical support and opportunities for growth in the area. The interdepartmental collaborations were further enhanced in the region with opportunities for pharmacy shadowing for our clinic nursing colleagues and vice versa. Notable highlights from the west include the optimization of Epic functionalities for Hem/Onc-specific needs in collaboration with the informatics group, sharing of practices across the various platforms and high-level engagement in the redesign workgroups.

The hiring of a Beacon Informatics pharmacist and the redesign of the Beacon committee with systemwide nursing, pharmacist and provider representation contributed significantly to the standardization of Beacon processes and

development of more uniform and endorsed protocols. Various processes associated with Beacon workflow have been standardized in collaboration with nursing and providers across the system. Additionally, the Beacon Informatics pharmacist role is also deeply embedded in the efforts toward the integration of a new platform for hematology and oncology therapy pathways.

A small but strong team of pharmacists provides systemwide medication therapy disease management for all patients on oral chemotherapy. As part of the ongoing efforts to improve patient safety, MTDM pharmacists in collaboration with the informatics team initiated the build of oral chemotherapy beacon plans and communication orders for such treatment plans are now in production. The team has done a tremendous job in improving efficiency by workflow prioritization, development of structured guidelines for patient referrals and discharge, streamlining treatment plan notes and improved communication to treating providers. The group continues its efforts with a focus on measurable outcomes while providing personalized care to cancer patients within the Cancer Institute and the Neuroscience Institute.

The Hematology/Oncology Pharmacy held its first community Educational Day on April 27, 2019, in Danville, Pa. The event, supported by the Center for Continuing Professional Development, focused on team building as well as educational activities and was attended by pharmacists, pharmacy technicians and leadership. Educational content at the event was provided by Mellar Davis, MD, FCCP, FAAHPM, on pain management, Benjamin Andrick, PharmD, BCOP, on stem cell transplant and Dennis Marjoncu, PharmD, on chimeric antigen receptor therapy (CAR-T). The attendees also collaborated to conduct a SWOT analysis on the current state of Hem/Onc Pharmacy. This facilitated a lively discussion that identified key steps for the continued growth of Hem/Onc pharmacy in the provision of excellent patient care. Pharmacists and technicians

were awarded continuing education credits, and the event celebrated the first in-person meeting of the Hem/Onc group and the building of collegial relationships across the system. The Hem/Onc Knowledge Management workgroup continues efforts to develop a more streamlined and regular knowledge-sharing opportunity by identifying the various specialty roles and functions within Hem/Onc and determining levels of competency and depth of knowledge required for each role.

Another area of significant development within Hem/Onc pharmacy is in the Hematopoietic Stem Cell Transplant Program with the implementation of an HCT MTDM pharmacist through a pilot program funded by GHP Quality Fund. Notable achievements of this pharmacist role include providing clinical support in pre-transplant medication reconciliation, stem cell mobilization support/management, pre-transplant education, and conditioning and graft versus host disease (GVHD) beacon plan support. The HCT MTDM pharmacist also provides post-transplant support in areas of transition of care management, GVHD surveillance, infection surveillance and vaccine compliance. HCT MTDM pharmacists act as physician extenders through their collaborative practice agreement and help facilitate the establishment of routine BMT multidisciplinary rounds. Additional achievements of the HCT MTDM pharmacist of significance include the proposal of a stem cell mobilization policy based on a MUE resulting in cost savings of approximately \$9,000 per peripheral stem cell mobilization, development of nursing and patient transplant education materials, creation, validation and standardization of transplant Epic orders, and the creation of safety parameters via development of conditioning regimen dose calculators. FY19 has seen tremendous growth in the transplant program with its first entirely outpatient autologous stem cell transplant at GWV Henry Cancer Center. To date, FY19 has had a growth of 350 percent in allogeneic transplants from the previous fiscal year, with 23 allogeneic transplants

and 22 autologous transplants.

In February 2019, the newly formed Hematology/Oncology Pharmacy & Therapeutics Subcommittee held its inaugural meeting. This committee was developed to serve in a clinical advisory role to the Geisinger Cancer Institute. The group is composed of physicians, nurses and pharmacists from across the Cancer Institute to promote a multidisciplinary approach. The subcommittee functions to promote evidence-based, safe and cost-effective therapies by conducting peer review of new Hem/Onc therapies, developing clinical practice guidelines, policies, and procedures, initiating Medication Utilization Evaluations and reviewing formulary recommendations. Routine review of adverse reactions/medication errors by the group contributes to the development of protocols for the safe and effective use of Hem/Onc therapies.

Our PGY2 Hem/Onc residency program welcomes the leadership of Benjamin Andrick, PharmD, BCOP, as the new PGY2 residency program director and continues to strive for excellence with its brilliant and talented pool of preceptors. A major program revamp is underway with an updated curriculum, layered learning experiences and focused preceptor development. These efforts are placed with a goal to further enhance the competencies of the resident learners in the advancing practice of hematology and oncology while optimizing the preceptorship of such advanced learners. Additionally, the PGY2 Oncology residency is collaborating with the new Geisinger Hematology/Oncology Fellowship program to promote multidisciplinary learnership.

FY19 ended on a high note with the placement of regional hem/onc coordinators (James Petrochko, RPh – Northeast, Alysha Lopez, PharmD – West, Rachel Sneiderman, PharmD, BCOP – Central), Quality Oncology Practice Initiative (QOPI), certification for the Central Region and USP 800 renovations of hem/onc pharmacies across the system. As a group, we are especially proud of our regional and systemwide interdepartmental support and collaborations with

providers and nursing. We are excited to continue to work in collaboration with the Geisinger Cancer Institute as we move into the new fiscal year with a focus on continued provision of safe, high-quality patient care and further expansion of our services as we embrace new and innovative ways to care for our cancer patients.

Hematology/Oncology Pharmacy by the numbers

- 8 pharmacies across the system serving 6 hematology/oncology inpatient areas and 11 outpatient clinics
- 18 pharmacists and 11 technicians specializing in Hem/Onc support a total of 19+ inpatient beds, 120+ infusion chairs, Pediatrics Hem/Onc, bone marrow transplant program, Beacon Informatics, medication therapy management, clinical research and the PGY2 hematology/oncology residency program



Development and expansion of the bedside delivery program

MyBedsideRx is the Geisinger medications-to-beds pharmacy delivery program. The program was initiated at Geisinger Medical Center as a concierge service more than 5 years ago, but at its start, had limited uptake with limitless opportunity. After several manifestations and inconsistencies in the service line, it became a priority for Enterprise Pharmacy to create a consistent program that could be introduced at hospital campuses and same-day surgery (SDS) centers with a co-located Geisinger retail pharmacy. The overall goal was to allow patients to leave the hospital with discharge medications in hand — providing the opportunity for increased compliance and decreased ED visits and readmissions due to obstacles with medication access and adherence. With a uniform pharmacy software and mobile point-of-sale in place, Epic enhancements and increased staff education in FY19 — we were able to take what was working at GMC and expand the MyBedsideRx program to Geisinger Wyoming Valley Medical Center, Geisinger Lewistown Hospital and Geisinger Gray’s Woods. After implementation, the overall FY19 achievement was expanding the MyBedsideRx program by partnering our inpatient and outpatient pharmacy teams. Together, the pillars of Enterprise Pharmacy were able to leverage our discharge program to patients and improve adherence, increase on-site prescription fills, incorporate medication education and promote Geisinger CareSite retail and mail-order pharmacy utilization.

Program benefits:

- Decrease readmissions
- Increase patient satisfaction
- Improve patient medication adherence and compliance
- Increase system and GHP savings
- Increase mail order utilization
- Capture lost revenue
- Improved communication with transitions of care

Key FY19 achievements:

- Uniform pharmacy platform conversions from HBS/ QS1 to Mckesson Enterprise (June 2018 – January 2019)
- Introduction of program at clinic-based setting – Gray’s Woods (September 2018)
- Expansion at GLH from SDS to whole hospital (February 2019)
- Epic banners to identify patients enrolled in the program and prescribing alerts to inform providers of where to route the medication for bedside delivery services

What’s next?

FY20 will serve to introduce consumer marketing and an option for patient self-enrollment, platform engagement by partnering with nursing and case management to further promote the benefits of MyBedsideRx, development of an Epic tracking dashboard and continued growth of processes established in FY19.

2019 fills	January	February	March	April	May	June
GMC	879	919	977	1228	1412	1214
GWV	338	459	461	479	498	517
GLH	98	105	134	181	160	128
OSSC	119	82	100	114	128	100

Development of state-of-the-art infusion prep sites in response to regulations

The regulatory environment continues to evolve with the introduction of the revised versions of USP chapters 797 and 795, which go live Dec. 1, 2019, along with USP 800. The goals of the USP chapters are to improve quality and safety of compounded medications. Whereas USP chapters 797 and 795 focus on patient safety, USP chapter 800 focuses on employee safety. The major focus of the chapters is on facility upgrades, policies, training and ongoing competency and facility assessment.

Geisinger sterile compounding services are composed of 20 sterile cleanrooms, including 17 pre-existing that have been renovated and 3 brand-new cleanrooms. This project began three years ago when a major capital improvement project to upgrade the facilities was approved. Three years later, thanks to Geisinger's early commitment and proactive approach, the project is on track to be completed early 2020. Once complete, the sterile environment in which medications are prepared will allow pharmacy to prepare the highest quality sterile product anywhere in the system. Additionally, employees who handle hazardous medications daily will be protected from the ill effects of chronic low-level exposure.

With the renovated and new facilities nearing completion, new policies and procedures needed to be developed and old ones revised for the rooms to function as designed and gain the maximum benefit. Geisinger has created one unified sterile products policy to replace over 80 policies that were being used at various locations throughout the system. Standardizing the policy is the first step in standardizing practices from Scranton to State College. Using one policy, we've eliminated and abandoned local practices and replaced them with system best practices. A person trained at GCMC could theoretically work in GHS without any

additional training. Standardizing the policies and resulting practices guarantees that the patients in Hawley are getting the same quality sterile compounded products as the patients in Harrisburg.

Parallel to the development of the USP 797 policy, competencies were developed to assure the current staff meet the standards to allow them to work in the new facilities. As the cleanrooms came online, staff were educated on best practices and evaluated so that they did not inadvertently contaminate the work area. The competencies involved online coursework, practical evaluation and testing, and observational evaluation. Each person allowed to work in a cleanroom has gone through this rigorous training and evaluation. All this information was collated and recorded in Simplifi and made available to JCAHO, DOH, and the board of pharmacy upon inspection. Pharmacy is currently in the process of using this same approach to evaluate the Hematology/Oncology staff. The next steps are to create the infrastructure that evaluates employee competency annually in didactic and observational evaluation, and semiannually in practical application.

As each of the new cleanrooms came online and the staff was trained and evaluated on best cleanroom practices, it became apparent that training varied depending on the location of training and the person doing the training. It was discovered early on that a standardized approach to training new employees' sterile products preparation was lacking. Standardized training is required so that following a rigorous training regimen, all employees could prepare sterile products of the same quality. This is high on the priority list for 2019–2020 and discussions on a unified approach are underway.

Comprehensive medication management within Geisinger at Home

Geisinger continually strives to provide the best care to our patients. Part of providing the best care includes keeping patients healthy and out of our hospitals, emergency departments and primary care offices. Unfortunately, for some patients this goal is challenging. To help our sickest patients, in April 2018 Geisinger initiated Geisinger at Home, a program designed to target the sickest patients and deliver personalized care to the patient in the comfort of their own homes. The team is multidisciplinary and provides services both in-person as well as telephonically. Pharmacists are key team members who support patients and other team members for medication related issues.

Geisinger at Home has five pharmacists across the system, two in the Northeast Region, two in the Central Region and one in the Western Region. As an essential care team member within Geisinger at Home, the pharmacists are utilized in multiple ways. They work closely with other members of the Geisinger at Home team to optimize patients' medication regimens. Some of these patients are on upward of 30 medications, so comprehensive medication management is key. Comprehensive medication management (CMM) is a service where pharmacists take a holistic look at a patient's medication regimen and adjust therapy to ensure

evidence-based and patient-centered use of medications. This includes both adding medication when indicated and removing medications that may no longer be needed. To date, pharmacists working with the Geisinger at Home team have performed over 200 CMMs where they identify an average of 4 medication-related problems. The pharmacists also perform transition of care medication reviews to identify acute issues/red flags during a patient's transition of care from the hospital to home. They communicate the issue to the Geisinger at Home provider prior to the post-hospital home visit with the Geisinger at Home team, so that the intervention can be made while the Geisinger at Home provider is in the patient's home. Pharmacists also manage chronic disease for this high-risk population and serve as drug information resources, aid in lab monitoring and interpretation and help to eliminate gaps in care. In the near future, the Geisinger at Home pharmacists will perform hospital discharge follow-up transitions of care visits with the community health assistant (CHA) in the home and utilize telehealth software to communicate with the patient and the CHA.



Pharmacy's response to the opioid epidemic

From the faucet to the drain, Geisinger has taken a proactive stance in addressing the opioid epidemic. The faucet consists of access to opioid medications and the drain consists of removing opioid medications from unwarranted use. Over the course of the last several years, Geisinger, with the help of Enterprise Pharmacy's leadership, has taken a proactive stance to address the opioid epidemic.

According to Mike Evans, chief pharmacy officer of Geisinger, "Geisinger has reduced opioid prescribing by 50 percent in the last 3 years. This achievement could not have been possible were it not for the system processes put into place by multidisciplinary teams and the hard efforts of our Pharmacy colleagues."

We know opioids can help, and we also know that they have unintended consequences. Within both the acute and the ambulatory settings, our pharmacists are on the front lines assuring that only judicious and appropriate use of opioids are being deployed. For example, prior to surgery and after surgery many patients are prescribed pain medications including opioids to help deal with perioperative pain. Within Geisinger this past year, we rolled out ProvenRecovery, Geisinger's Enhanced Recovery After Surgery (ERAS) program that incorporates evidence-based best practice elements to improve the quality of care, reduce postoperative complications, reduce the cost of care and improve patient experience. One component of this program is a multimodal pain treatment regimen that includes the use of non-opioid pain medications to help eliminate the prescription of opioids from perioperative pain protocols. This may be thought to have a negative effect on pain suffering among our patients, but as part of a comprehensive approach to surgical management, ProvenRecovery provides better pain management and quicker time to recovery.

Geisinger also leads a multi-institutional collaboration funded by the Cardinal Health Foundation. This effort culminated in a 2-day workshop where representatives from all 15 institutions convened in Columbus, Ohio, to discuss their best approaches to pain management and opioid stewardship. Leading the effort was Jerry Greskovic, system director for ambulatory programs of Enterprise Pharmacy, and Leeann Webster, assistant director of ambulatory programs in the west and south. Geisinger was solicited to lead this effort due to its advanced practice standards and the impact it's been able to achieve in addressing the opioid epidemic. Per Jerry Greskovic, "I was pleased to be a part of realizing the highest potential of healthcare systems to address such a problem." The collaboration with institutions from across the nation provides the bedrock to make these best practices scalable to other places.

Critical to the success of proper prescription of opioid medications within our system is an up-to-date and accurate medication profile. Geisinger was the first in Pennsylvania to integrate the prescription drug monitoring program (PDMP) into the electronic health record with a large lift by Enterprise Pharmacy's informatics team. This integrated prescription drug monitoring program provides real-time information on a patient's opioid prescribed medication profile not limited to Geisinger locations. Further, in the past year, review of this profile by pharmacists has been instrumental in assisting providers with appropriate prescribing of opioids during acute visits. Geisinger has also added other clinical decision support tools to decrease the amount of opioid prescriptions including default quantity limits for prescriptions, availability of a morphine equivalent calculator to providers and pharmacists which automatically calculates and displays based on the patient's active prescriptions and guidance upon discharge for opioid prescriptions.

Similar to PDMP processes, electronic prescribing of controlled substances allows for improvement in workflow, efficiencies, patient/provider satisfaction, prescriber tracking and overall security — not to mention the obvious benefit of removing paper prescriptions from the offices to reduce the risk of altered, stolen and fraudulent prescriptions. Currently, as a system, 84 percent of our controlled substances are being e-prescribed, which is a drastic improvement from 64 percent in 2017.

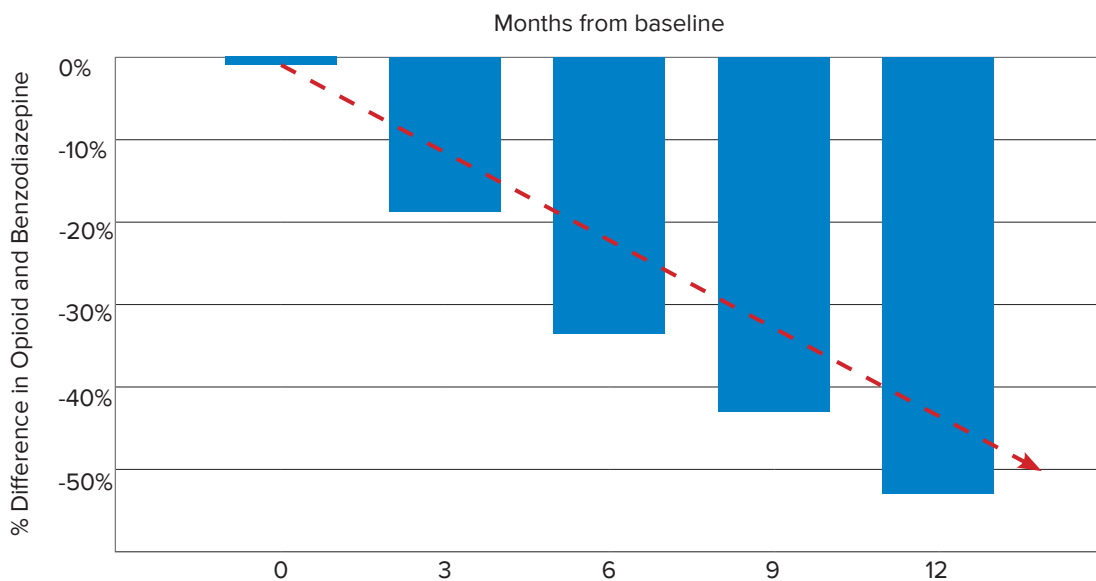
Geisinger’s Ambulatory Medication Therapy Disease Management Pain program has grown from 1 pharmacist embedded within interventional pain in 2012 to 9 pharmacists in 15 primary care sites across the system. These clinical pain pharmacists continue to help patients with chronic, non-cancer pain manage their pain more effectively and safely. Our MTDM pain pharmacists work collaboratively with the primary care provider to decrease opioid use and use adjunctive medications and alternative therapies to manage chronic pain. Their efforts have resulted in a 35 percent reduction in morphine equivalent dose per day and a 54 percent reduction in the co-prescribing of opioids and benzodiazepines.

Disposal of opioids from the home continues to be a top priority for Geisinger. As of the end of fiscal

year 2019, Geisinger hosts 38 separate continuous drug take-back locations throughout Geisinger and its partnering organizations. Over the past year alone, Geisinger has collected over 8,000 pounds of leftover medications from the community, with an estimate of 10 percent (or 800 pounds) being controlled substances.

The health plan’s opioid strategy has been a slow evolution. Before opioids became a national crisis, back in 2011, the health plan initiated a 4x4x4 report. The report notified physicians when a member had 4 or more opioids from 4 or more providers, filled at 4 or more pharmacies. Skip ahead to 2013 when CMS implemented the Opioid Management System (OMS). This program required health plans to identify Part D members who were potential overutilizers of opioid medications. CMS also identified potential overutilizers and required the health plan to determine if the member’s opioid regimen was safe and effective and to identify utilization of fraud, waste and abuse around opioids. Later in 2014, quantity limits were applied to opioids in our GHP family formulary. In 2015, together with a team from the system, a collaborative review of coverage for non-opioid pain management benefits was undertaken.

MTM Opioid and Benzodiazepine trends – % Change from baseline



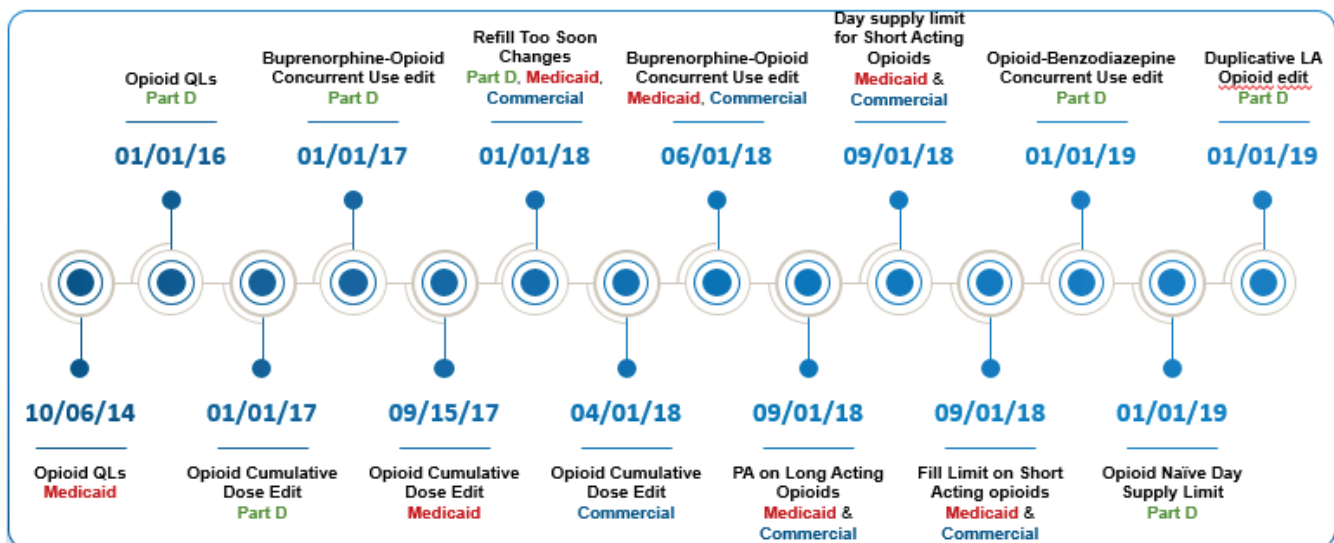
In 2017, the Pennsylvania Department of Health and Human Services instituted opioid guidelines for the Medicaid population which Managed Medicare organizations were required to follow. Later in 2018, Geisinger Health Plan received a letter from several state government agencies requesting that the health plan adopt the new forthcoming Medicaid opioid policies for all commercial plans as a means of combating the opioid epidemic. The plan was being rolled out in three phases from Sept. 1, 2018, through July 1, 2019. Here's a look at a timeline showing the different changes implemented by line of business to help reduce opioid overutilization and prevent overdoses.

All our efforts have had an impact on opioid utilization. In a 2-year period, we saw a 37 percent reduction in opioid claims for all lines of business. Medicaid had the best results because this is where the requirements were strictest. In Medicaid, we saw a 49 percent reduction in opioid claims. For the commercial line of business, we saw a reduction of 35 percent in opioid claims. The criteria for this line of business was not as strict as Medicaid's in the beginning. The least amount of reduction in opioid claims was seen in the Medicare line of business.

We only saw an 8 percent reduction, as CMS did not allow the health plan to be as restrictive with our Medicare members.

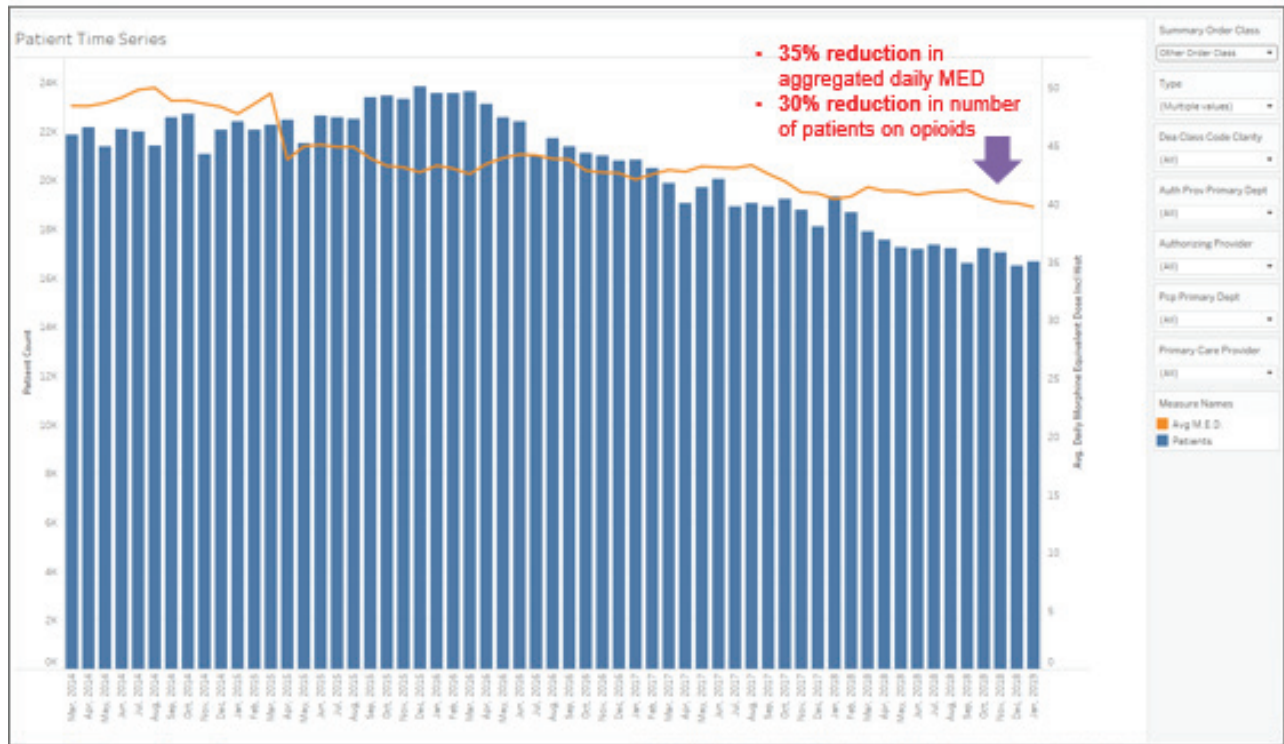
The goal of reducing opioid utilization was never about cost savings. It was about doing the right thing. At the same time we saw a reduction in opioid claims, we saw an increase in Suboxone claims. Suboxone is our number 2 drug by cost for our Medicaid line of business. Finding providers to treat opioid addiction was difficult at best. As a result, Geisinger began stand-up MAT clinics, which were crucial to getting members the treatment they needed. Our Medication Assisted Treatment (MAT) program is now located in four sites: Bloomsburg, Scranton, South Wilkes-Barre and Williamsport. The MAT clinic consists of an addiction-trained care team that simultaneously addresses a patient's addiction-related medical needs and social barriers that negatively impact their health.

Geisinger has revolutionized clinical practices by implementing innovative programs to steer patients to other methods of pain management. We educate our providers regarding safe prescribing habits and



use the technology in our electronic medical record to create effective prescribing processes. Our goal is to continue to educate and empower patients, providers and others to address pain management in a safe and effective way and to do our best to impact the opioid epidemic.

For more information on Geisinger's approach, read a description of efforts published in the *Harvard Business Review* (hbr.org/2018/11/how-geisinger-health-system-reduced-opioid-prescriptions) and Geisinger's #HadEnough website at (geisinger.org/HadEnough).



Implementation of pharmacogenomics

With widespread advanced pharmacy practice in both the acute and the ambulatory care practices along with informatics systems in an electronic health record, best practices and improvements in population management have been achievable within our settings. Despite all these achievements, one missing piece of information has kept us from realizing the fullest potential of personalized medicine and pharmacy care. That is pharmacogenomic information. Information about a person's genomic makeup was not available for action until the most recent decade and is

now exploding into care. Pharmacists are used to patient-to-patient variation in kinetic and dynamic pharmaceutical responses, but never had access to the underlying genomic make up of an individual. We knew patients respond to drugs differently based upon their genomic makeup but could not distinguish what genetic differences existed in patients until recently.

Over the past 10 years, Geisinger has made tremendous strides to understand how genetics impact the care of our patients. Through the

MyCode® Community Health Initiative, Geisinger has whole exome sequenced over 135,000 people and returned genetic test results to over 1,000 patients. This wealth of information provides a backdrop to add genomic information to the rest of individualized patient information available for drug therapy management decisions. Currently, Geisinger has pharmacogenomic test results available for action on over 2,500 patients and was the second healthcare system in the nation to use Epic's electronic health record module for genomic information within the electronic health record. As such, Geisinger is well positioned to capitalize on the growing genomic information available on its patient population in real time.

Early in the year, a team was established to begin the process of integration of genomics information into the EHR. This integration was driven by several factors, including the availability of validated genomic and pharmacogenomic data for a subset of patients who were participating in the MyCode project, the release by our EHR vendor, Epic, of a genomics module that would assist in storing and managing the genomics data, and the increasing reality that the availability of pharmacogenomics data was necessary in order to drive appropriate drug therapy decision making. The team from Geisinger came together with a team from Epic to develop a plan for setup and implementation of the genomics module in Epic. Because this module was new, Epic wanted to work closely with us in the setup process and obtain our input and feedback on the appropriate utilization of the module in clinical practice. A phased implementation was chosen, with the first phase focused on the ability to assimilate existing data into Epic and make it available for review and the application of decision support. Validated results from approximately 1,200 patients from the MyCode project were targeted for the initial ingestion of pharmacogenomic data into the EHR. Several key steps needed to be completed to ensure the data would be imported

properly and available for the application of decision support. These included formulation of the data in a format that could accurately pass through the lab interface into Epic, development of standardized fields for documentation of the results within Epic, development of patient friendly information on the test results for display within the myGeisinger environment and development of decision support relative to pharmacogenomic data which may impact drug therapy decisions. Over several months, the pharmacy informatics team worked on the development and testing of the information and decision support needed to support the availability of pharmacogenomic data within the EHR. Also, validation of the imported pharmacogenomic data occurred first in an alternative environment and then within the production environment, immediately after the initial go-live with the genomic module. Validation confirmed accuracy of the data and the corresponding decision support.

With the initial phase of the implementation completed, next steps include creating a process to order targeted pharmacogenomic testing; conversion of current existing text file pharmacogenomic data in the EHR to discrete data within the genomic module to support the addition of decision support to that data; and the development of decision support predictive algorithms, which will help guide the proactive ordering of appropriate pharmacogenomic testing. In addition, work will be done to import additional validated MyCode data to make that information available for clinical decision-making.

Pharmacy educational programs

Enterprise Pharmacy expands to add Knowledge Management pillar to its infrastructure

What is Knowledge Management? Knowledge is a strategic asset for any organization, and the Knowledge Management pillar in Enterprise Pharmacy is aware of its value. The leadership of Enterprise Pharmacy created the Knowledge Management pillar to bring education into its core responsibilities.

Knowledge Management will be involved with student management; residency programming and expansion; pharmacist competencies and collaborative practice initiatives; technician development; and a multitude of interdisciplinary ventures with the Geisinger Commonwealth School of Medicine, Community Medicine and Academic Affairs. As different educational needs and requirements present to Enterprise Pharmacy, Knowledge Management's goal is to help meet these needs.

For student pharmacists, the goal is to maximize the number of rotations in the Geisinger system and have nearly every pharmacy engaged with learners during their pharmacy school career. The number of pharmacy training opportunities for students in Geisinger far exceeds what students expect or know about in school. The number of students rotating through Geisinger for an introductory or advanced practice experience this past year was at its highest and will continue grow as we develop a framework for integrating them as extensions of Enterprise Pharmacy

Geisinger hosted three residency programs and six residents this year. As the PGY1 program at GMC grows to five residents in the coming year, so does the need to expand residency programming throughout the system. The addition of Knowledge Management will give Enterprise Pharmacy an opportunity to create a strategic plan for pharmacy residency expansion across the entire Geisinger system, increasing the number of PGY1 offerings and introducing several new PGY2 specialty programs.

As pharmacist and technician responsibilities continue to expand within Geisinger, so does the need to ensure each member of the team is capable of practicing at the same high level. Look to Knowledge Management to support pharmacists and technicians to ensure their preparedness. In June, Dan Longyhore joined Enterprise Pharmacy as system director for the Knowledge Management pillar. Dr. Longyhore comes from a career in higher education with experience and training in curriculum development, assessment and strategic planning for education in pharmacy.



Dan Longyhore
System Director
Knowledge Management

Enterprise Pharmacy Summer Internship Program offers a “mini-residency” experience

Each summer, Geisinger Medical Center in Danville hosts an Enterprise Pharmacy Summer Internship Program. Led by the assistant director of pharmacy, Sarah Hale, PharmD, BCPPS, and the PGY1 pharmacy residency director, Angela Slampak-Cindric, PharmD, BCPS, BCCCP, the program provides student pharmacists an advanced educational experience with an emphasis on exceptional patient care, clinical therapeutics, disease state management and pharmacy operations. The program is designed for motivated students completing their second or third professional years who have a strong interest in learning about hospital and clinical pharmacy practice. This unique opportunity offers summer interns a “mini-residency” experience with exposure to a variety of hospital pharmacy practice sites, ambulatory care clinics and longitudinal project management.

Summer interns round with pharmacists on interdisciplinary patient care teams in areas including cardiology, infectious diseases, internal medicine, nephrology, critical care medicine, hematology, oncology, pediatrics and more. Interns spend time in the Emergency Department and engage

in ambulatory care pharmacy practice, focusing on anticoagulation and chronic disease state management. As valued members of the pharmacy team, interns gain exposure to both the principal distributive and advancing clinical functions of the pharmacist.

Additional educational opportunities include patient counseling, medication reconciliation and drug utilization evaluation projects, as well as participation in committee meetings and pharmacist staff development activities. Interns also hone their presentation skills by delivering a final capstone patient case presentation to pharmacy staff. Their experience culminates in a poster presentation at the ASHP Midyear Clinical Meeting. This year’s interns will present an evaluation of bivalirudin in patients undergoing extracorporeal membrane oxygenation support and a review of parenteral iron utilization practices for microcytic anemia.

Enterprise Pharmacy is passionate about sharing its innovative model of hospital pharmacy practice while building a foundation of valuable patient care skills in our early learners.



“The Geisinger Medical Center summer internship has provided me with an abundance of clinical inpatient experience as well as ambulatory care opportunities earlier than majority of my classmates. Having the opportunity to present patients on rounds, to do medication teachings prior to discharge, to do medication reconciliation in the Emergency Department, and to work in the central inpatient pharmacy are things I never would have had the opportunity to do as a rising P3 student. The preceptors are wonderful and always take the time to teach me so much every time I am with them. I feel prepared, motivated and inspired to go into my P3 year after this amazing experience!”

– Skyee Edwards, Wilkes University

"I feel so blessed to have been given the opportunity to intern at Geisinger Medical Center because I have gained invaluable exposure to a variety of clinical settings that most students do not experience until APPE rotations. Our schedule was carefully balanced to allow exposure to interdisciplinary patient care, direct patient counseling and pharmacy operations in the central pharmacy. Every preceptor I worked with was patient and thoughtful while teaching me. As a student, I really appreciated the opportunity to work up patients and write notes independently, so I could truly take ownership over my work. Looking ahead to September, I am excited to begin my third year of pharmacy school because I have no doubt my experiences this summer will serve as a practical foundation to complement my didactic courses."

– Melanie Umbaugh, University of Pittsburgh

Clinical learning environments for student pharmacists and medical trainees

The Enterprise Pharmacy Department is pleased to host advanced and introductory practice student pharmacists from 15 schools of pharmacy. Student pharmacists are immersed in a collaborative interprofessional culture where clinical pharmacists practice at the top of their license in acute care, ambulatory care, specialty pharmacy and research.

A sampling of our menu of learning experiences includes:

Acute care learning experiences

Bone marrow transplant	Institutional practice	Pediatric critical care
Cardiology	Internal medicine	Pediatric oncology
Critical care medicine	Neonatal intensive care	Pediatrics
Emergency medicine	Nephrology	Transplant – solid organ
Hematology	Nutrition support	Trauma
Infectious diseases	Oncology	

Ambulatory care learning experiences

Ambulatory oncology	Heart failure	Pain management
Anticoagulation	Hepatology	Transitional care
Family medicine	Neurology	

Elective learning experiences

Home infusion	Research	Specialty pharmacy
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Affiliated schools of pharmacy

University at Buffalo School of Pharmacy and Pharmaceutical Sciences

Binghamton University School of Pharmacy and Pharmaceutical Sciences

Campbell University College of Pharmacy and Health Sciences

Creighton University School of Pharmacy and Health Professions

Duquesne University School of Pharmacy

D'Youville School of Pharmacy

LECOM School of Pharmacy

LIU Pharmacy – Arnold & Marie Schwartz College of Pharmacy and Health Sciences

Marshall University School of Pharmacy

Medical University of South Carolina College of Pharmacy

Philadelphia College of Pharmacy

Shenandoah University School of Pharmacy

Temple University School of Pharmacy

University of Pittsburgh School of Pharmacy

Wilkes University Nesbitt School of Pharmacy

Geisinger pharmacists are also delighted to host Geisinger Commonwealth School of Medicine medical students for interprofessional rotations. This experience provides physicians-in-training an opportunity to understand the roles of all members of the healthcare team and to function well within these teams. Pharmacists model a culture of respect and a spirit of collaboration to optimize patient care outcomes and the patient experience.



Geisinger residency programs cultivate caring clinicians and lifelong learners

Geisinger offers customized residency education to successfully prepare pharmacists to care for patients, innovate, lead and work collaboratively with interprofessional colleagues to improve the quality of care. Geisinger Medical Center is home to a PGY1 Pharmacy Residency Program led by Angela Slampak-Cindric, PharmD, BCPS, BCCCP, and a PGY2 Oncology Pharmacy Residency Program under new leadership with Benjamin Andrick, PharmD, BCOP. Geisinger Wyoming Valley Medical Center offers a PGY1 Pharmacy Residency Program led by Jamie Kerestes, PharmD, BCCCP.

Residents work collaboratively with interprofessional teams to provide optimal patient care and improve the patient experience. Geisinger pharmacists' rapport with nurses, physicians and the interprofessional team has long been established and affords our residents enriching opportunities for professional growth. Geisinger Medical Center critical care medicine fellow Kenneth Snell, MD, remarks, "Critical care requires immense teamwork to truly provide the highest-quality patient-centered care. Having pharmacists as a part of the team allows for evidence-based practice, energetic academic discussion and the confidence that our patients are receiving excellent care." Staff physician Eric Melnychuck, MD, shares, "The team is not complete without the pharmacist. There are two ways we ultimately help patients: the knife and the pill. Pharmacists are the experts at making sure we use the pills correctly."

From managing anticoagulation and diabetes to responding to adult codes and stroke alerts, pharmacists at Geisinger are on the front lines of patient care. "To practice in such a progressive manner is truly one of the most exciting aspects of clinical pharmacy at Geisinger," remarks PGY2 oncology pharmacy residency graduate

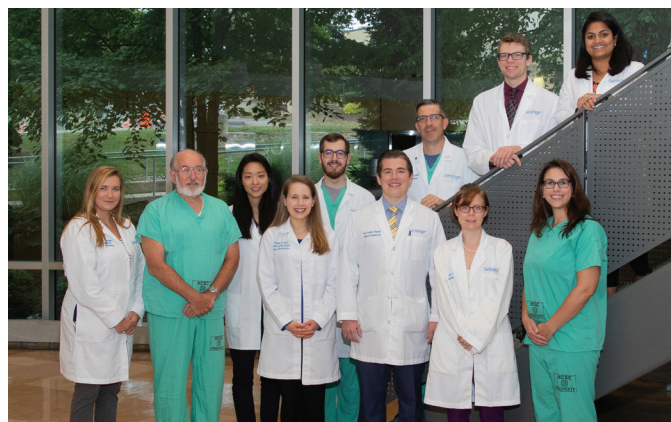
Anupama Mathur, PharmD. Our residency program activities are designed for residents to develop the knowledge, skills and attitudes to provide exemplary pharmaceutical care. Each learner's curriculum is expertly customized to facilitate achievement of personal and professional aspirations. In addition to the rich core clinical curriculum that spans both acute and ambulatory care, residents longitudinally develop teaching, research and leadership skills. Geisinger Medical Center PGY1 Pharmacy Residency Program graduate Hayley Kay, PharmD, says, "Geisinger's residency prepared me to be a lifelong learner and evolve with the ever-changing pharmacy profession. I have taken aspects of each preceptor and student I have come across to create my own professional practice." Amy Robacheski, a graduate of the Geisinger Wyoming Valley PGY1 Residency Program, comments, "My residency at Geisinger Wyoming Valley was tailored to meet my specific interests and help me achieve my future goals. It also required me to complete a diverse core curriculum that allowed me to explore and find new areas of interest I never knew I had. The one thing I feel this program offers unlike any other is the incredibly welcoming and supportive preceptors and staff. I felt like I was a part of the pharmacy family from day one and I forged many relationships that I still value today."

Leadership development is an essential part of pharmacy education. Geisinger residents develop as leaders through personal reflection, study and exposure to visionary pharmacy leaders. This monthly discussion series exposes pharmacy residents to enrichment topics such as emotional intelligence, mentorship, building collaborative professional relationships and more. Offered in tandem with our preceptor development teaching enrichment series where all clinical faculty sharpen their precepting skills, residents are immersed in

a learning environment that encourages them to grow as clinical practitioners, leaders and educators. Geisinger PGY1 Pharmacy Residency graduate Bradley Lauver, PharmD, BCPS, says, “Residency allowed me to see all aspects of the pharmacy enterprise simultaneously, from direct patient care to management decisions, and asked me to develop my critical thinking skills to see the big picture, too. I am grateful for residency for developing these skills in me, because it paved the way for my career to positively impact patient care at multiple levels.”

In addition to serving as educators for our patients and interprofessional colleagues, many Geisinger residents serve as primary preceptors for advanced practice student pharmacists. Mentored by senior clinical pharmacists, residents have the opportunity to facilitate layered learning and cultivate teaching abilities. PGY2 oncology pharmacy residency graduate Dennis Marjoncu, PharmD, says that as a preceptor during his PGY1 year at Geisinger, it “was very enlightening getting to see how much I learned throughout the year and how students go through the learning process — seeing the light bulb go on when they understand an idea. Not only did I have my own student, but I had numerous opportunities to interact with additional students, which created opportunities for informal teaching. By being a teacher, I got to see how rewarding it is to impart knowledge and build new relationships with rising pharmacists.”

As patient educators, our residents are improving the patient experience for those we serve. PGY1 Pharmacy Residency graduate Stacey Grassi, PharmD, says that during her residency at Geisinger she was teaching an elderly patient about enoxaparin. The patient had no one at home to help her. She was scared and began to cry. Dr. Grassi provided support and reviewed how to self-administer the injectable medication step by step. The patient was then able to do the injections herself. Later that month, the patient sent Dr. Grassi a thank-you note, sharing how much she appreciated the time she spent with her. Each time a resident provides reassurance and enables a patient to improve their own health, they impact the patient experience.



PGY2 Oncology Residency Program staff (from left to right):
Front row: Constance Topolewski, Gary Lewis, Angela Slampak-Cindric (GMC PGY1 pharmacy residency director), Benjamin Andrick (PGY2 oncology residency director), Amy Ellenburg, Lori Stopper **Back row:** Jei Won Eckel, Tristan Maiers, Adam Gross, Grant Lee (PGY2 oncology resident), Anupama Mathur

Research experiences for student pharmacists and medical trainees

The Center for Pharmacy Innovation and Outcomes (CPIO) was pleased to host 9 students on immersion research experiences lasting from 5 to 10 weeks. Medical and pharmacy students were hosted from the Geisinger Commonwealth School of Medicine (4), Wilkes University (4) and the Philadelphia College of Pharmacy at the University of the Sciences (1). Students contributed to research projects and participated in discussions on the fundamentals of research. Examples of projects included a systematic review of community pharmacists’ roles in transitions of care, reviewing how social influencers of health are documented in the electronic health record and studying pharmacist services delivered as part of Geisinger at Home.

Annual pharmacy conferences

Education is one of the core principles of the vision of Enterprise Pharmacy. As medical knowledge continues to expand and change, our department has found innovative ways to be on the forefront of pharmaceutical education. To assist with achievement of our vision, the following unique educational conferences were created and occur each year: The Fresh Pharm: A Medication Update Conference, Current Concepts in Medication Safety Conference and the Clinical Pharmacy Retreat.

The Fresh Pharm: A Medication Update Conference

This is an annual interprofessional, jointly accredited continuing medical education conference that has showcased the expertise of our pharmacy professionals for more than a decade. Advanced practitioners, dentists, nurses, pharmacists and physicians from Geisinger and other organizations gather to review new medications, treatment guidelines and vaccination updates. This course is presented by our Enterprise Pharmacy clinical pharmacists and pharmacy residents. Health professionals garner 6 hours of continuing education credits via this opportunity to advance their knowledge, skills and network with interprofessional colleagues. Topics vary annually, but most recently included:

- Newly Approved Medications and Indications: A Year in Review
- Sepsis, Pain, Agitation and Delirium: An Intensive Care Extravaganza
- Immunization Palooza: Vaccination SnapSHOTS & Influenza Updates
- Medication Update: Treatment of Opioid Use Disorder
- Cardiovascular Potpourri: Updates on Aspirin, Hyperlipidemia, Advanced Cardiac Life Support and More
- Updates in Diabetes & Hypertension Management
- Vitamins, Plants & Essential Oils: A Complimentary & Alternative Medication Update
- Adventure in Bone Marrow Transplant

Clinical pharmacy retreats provide a chance to see pharmacy advancement and collaboration

The fall clinical pharmacy retreat saw many familiar faces lead discussions, including Mike Evans (the future of Enterprise Pharmacy), Dean Parry (the future of pharmacy practice), Mike Gionfriddo (shared decision-making) and Greg Titus (team-building). The clinical pharmacy retreats provide pharmacists in the Geisinger system with an opportunity to expand their understanding of pharmacy practice in Enterprise Pharmacy by learning about the advancements taking place in each practice area and discovering opportunities for collaboration in patient care.

The Current Concepts in Medication Safety Conference

The Current Concepts in Medication Safety Conference is an annual conference that began in 2009 and celebrated its 10th year in March 2019. The conference was initially supported by the Maneval Endowment Fund and recently by Geisinger's Center for Continuing Professional Development and the Geisinger Commonwealth School of Medicine. The planning committee consists of representatives from provider, pharmacy, nursing and respiratory services across Geisinger campuses.

The goals of the conference are to identify the scope, complexity and implications of medication errors, to examine the impact human factors and organizational culture have on error prevention and to discuss latest concepts in providing error-free care to our patients.

Topics from the 2019 conference included:

- A Change of Heart: Transforming Diabetes Management
- Cultivating High-Functioning Teams: Ethical and Other Arguments
- Fall Prevention Deserves Your Attention: Medication Safety Is Key, It Is Up to You and Me!
- Interprofessional Education and Collaboration to Improve Patient Safety
- The American Opioid Crisis: How Did We Get Here and What Do We Do Now?
- USP <800>: Handling Hazardous Drugs Safely

Conference speakers have included Geisinger pharmacists, providers and nurses as well as guest speakers from diverse backgrounds such as ISMP, Cardinal Health, Wilkes University and Philadelphia College of Pharmacy University of the Sciences. Health professionals from Geisinger and other organizations have an opportunity to advance their knowledge and skills in medication safety while earning 6 continuing education credits.

Another highlight of the conference is the annual Medication Safety Poster Competition. The poster competition offers participants the opportunity to share medication safety initiatives as well as network with other health professionals.

Winners of the 2019 competition included:

- The multidisciplinary team of Susan Butler, S. Henna Maiers, Shannon Draus, Leslie Taleroski, Kim Nissen, Elizabeth Gajkowki and Jason General, who presented their poster "Impact of Critical Low Restock Report Utilization to Reduce Automated Dispensing Cabinet Stockouts and Delayed Doses in a Children's Hospital"
- The multidisciplinary team of Dante Grassi, Jove Graham, Melissa Kern, Amanda Sharry-Rogers, Douglas Nathanson, Megan Esch, Joseph Chronowksi, Michael Evans and Melissa Sartori, who presented their poster "Patient Safety Outcomes Using a ProvenCare® Model for Multiple Sclerosis Patients on Disease Modifying Therapies"
- The pharmacy team of Jordan Moore, Kelsey Siebold, Melanie Hawn and Callie Drennen, who presented their poster "Medication Utilization Evaluation of Intravenous Dextrose at Geisinger Medical Center"

Publications, presentations and posters

Publications

Articles

1. Collins LK, Pande LJ, Chung DY, Nichols SD, McCall KL, **Piper BJ**. (2019 June). Trends in the medical supply of fentanyl and fentanyl analogues: United States, 2006 to 2017. *Prev Med*, 123:95-100. doi: 10.1016/j.yjpm.2019.02.017
2. Dobler CC, Sanchez M, **Gionfriddo MR**, Alvarez-Villalobos NA, Singh Ospina N, Spencer-Bonilla G, Thorsteinsdottir B, Benkhadra R, Erwin PJ, West CP, Brito JP, Murad MH, Montori VM. (2019 June). Impact of decision aids used during clinical encounters on clinician outcomes and consultation length: a systematic review. *BMJ Qual Saf*, 28(6):499-510. doi: 10.1136/bmjqs-2018-008022
3. **Dombrowski SK**, Bacci JL, Klatt PM, Osborne MA, Castelli GB, Burns A, McGivney MS. (2019 May–June). Key factors for sustainable integration of pharmacists in outpatient team-based primary care. *J Am Pharm Assoc*, 59(3):439-448. doi: 10.1016/j.japh.2019.02.005
4. Barrionuevo P, **Gionfriddo MR**, Castaneda-Guarderas A, Zeballos-Palacios C, Bora P, Mohammed K, Benkhadra K, Sarigianni M, Murad MH. (2019 May). Women's Values and Preferences Regarding Osteoporosis Treatments: A Systematic Review. *J Clin Endocrinol Metab*, 104(5):1631-1636. doi: 10.1210/jc.2019-00193.
5. **Jones LK**, **Lussier M**, Brar J, Byrne M, Durham M, Kiokemeister F, Kjaer K, Le H, Magee C, Mcknight E, Mehta N, Papp J, Pastwa E, Radovich P, Ravin K, Ruther M, Woodie G, Wrona S, Yousefvand G, **Greskovic G**. (2019 May). Current interventions to promote safe and appropriate pain management. *American Journal of Health-System Pharmacy*, 76(11):829-834. doi: 10.1093/ajhp/zxz063
6. **Lussier ME**, **Graham JH**, **Tusing LD**, **Maddinini B**, **Wright EA**. (2019 May). Analysis of community pharmacist recommendations from a transitions of care study. *Journal of the American College of Clinical Pharmacy*. doi: 10.1002/jac5.1139 [Epub ahead of print].
7. Murad MH, Larrea-Mantilla L, Haddad A, Spencer-Bonilla G, Serrano V, Rodriguez-Gutierrez R, Alvarez-Villalobos N, Benkhadra K, **Gionfriddo MR**, Prokop LJ, Brito JP, Ponce OJ. (2019 May). Antihypertensive Agents in Older Adults: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. *J Clin Endocrinol Metab*, 104(5):1575-1584. doi: 10.1210/jc.2019-00197.
8. Pendergrass SA, Crist RC, **Jones LK**, **Hoch JR**, Berrettini WH. (2019 May). The importance of buprenorphine research in the opioid crisis. *Mol Psychiatry*, 24(5):626-632. doi: 10.1038/s41380-018-0329-5
9. Ponce OJ, Larrea-Mantilla L, Hemmingsen B, Serrano V, Rodriguez-Gutierrez R, Spencer-Bonilla G, Alvarez-Villalobos N, Benkhadra K, Haddad A, **Gionfriddo MR**, Prokop LJ, Brito JP, Murad MH. (2019 May). Lipid-Lowering Agents in Older Individuals: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. *J Clin Endocrinol Metab*, 104(5):1585-1594. doi: 10.1210/jc.2019-00195.
10. Simpson KJ, Moran MT, Foster ML, Shah DT, Chung DY, Nichols SD, McCall KL, **Piper BJ**. (2019 April). Descriptive, observational study of pharmaceutical and non-pharmaceutical arrests, use, and overdoses in Maine. *BMJ Open*, 9(4):e027117. doi: 10.1136/bmjopen-2018-027117
11. Zeballos-Palacios CL, Hargraves IG, Noseworthy PA, Branda ME, Kunneman M, Burnett B, **Gionfriddo MR**, McLeod CJ, Gorr H, Brito JP, Montori VM; Shared Decision Making for Atrial Fibrillation (SDM4AFib) Trial Investigators. (2019 April). Developing a Conversation Aid to Support Shared Decision Making: Reflections on Designing Anticoagulation Choice. *Mayo Clin Proc*, 94(4):686-696. doi: 10.1016/j.mayocp.2018.08.030
12. **Wright EA**, **Graham JH**, Maeng D, **Tusing L**, Zaleski L, Martin R, Seipp R, Citsay B, McDonald B, Bolesta K, Chaundy K, Medico CJ, Gunderman S, **Leri F**, **Guza K**, Price R, **Gregor C**, **Parry DT**. (2019 March–April). Reductions in 30-day readmission, mortality, and costs with inpatient-to-community pharmacist follow-up. *J Am Pharm Assoc*, 59(2):178-186. doi: 10.1016/j.japh.2018.11.005.

13. Jones LK, Ladd IG, Gregor C, Evans ME, Graham J, Gionfriddo MR. (2019 March). Understanding the medication prior-authorization process: A case study of patients and clinical staff from a large rural integrated health delivery system. *Am J Health Syst Pharm*, 76(7):453-459. doi: 10.1093/ajhp/zxy083
14. Kunneman M, Gionfriddo MR, Toloza FJK, Gärtner FR, Spencer-Bonilla G, Hargraves IG, Erwin PJ, Montori VM. (2019 March). Humanistic communication in the evaluation of shared decision making: A systematic review. *Patient Educ Couns*, 102(3):452-466. doi: 10.1016/j.pec.2018.11.003
15. Vadakara J, Andrick B. (2019 March). Current advances in Hodgkin's Lymphoma. *Chronic Dis Transl Med*, 5(1):15-24. doi: 10.1016/j.cdtm.2019.02.003
16. Horsley RD, Vogels ED, McField DAP, Parker DM, Medico C, Dove J, Fluck M, Gabrielsen JD, Gionfriddo MR, Petrick AT. (2019 Feb.). Multimodal Postoperative Pain Control Is Effective and Reduces Opioid Use After Laparoscopic Roux-en-Y Gastric Bypass. *Obes Surg*, 29(2):394-400. doi: 10.1007/s11695-018-3526-z
17. Agnihotri S, Mansouri S, Burrell K, Mira Li, Mamatjan Y, Liu J, Nejad R, Kumar S, Jalali S, Singh SK, Vartanian A, Chen EX, Karimi S, Singh O, Bunda S, Mansouri A, Aldape KD and Zadeh G. (2019 Jan.). Ketoconazole and Posaconazole Selectively Target HK2 Expressing Glioblastoma Cells. *Clin Cancer Res*, 25(2):844-855. doi: 10.1158/1078-0432.CCR-18-1854
18. DeRemer CE, Andrick BJ, Capito MD. (2019 Jan.). Clozapine drug-induced pancreatitis of intermediate latency of onset confirmed by de-challenge and re-challenge. *Int J Clin Pharmacol Ther*, 57(1):37-40. doi: 10.5414/CP203314
19. Graham J, Tusing LD, Gregor CM, Wright EA. (2019 Jan.). Community Pharmacists' Perceptions of Care Following the Implementation of a Transitions-of-Care Program. *J Pharm Pract*. doi: 10.1177/0897190018824819 [Epub ahead of print].
20. Singh Ospina N, Phillips KA, Rodriguez-Gutierrez R, Castaneda-Guarderas A, Gionfriddo MR, Branda ME, Montori VM. (2019 Jan.). Eliciting the Patient's Agenda- Secondary Analysis of Recorded Clinical Encounters. *J Gen Intern Med*, 34(1):36-40. doi: 10.1007/s11606-018-4540-5
21. Sellers W, Becker N, Bendas C, Toy F, Klock B, Kerestes J, Young A, Badger C, Jensen J. (2018 Dec.). Utility of 4-Factor Prothrombin Complex Concentrate in Trauma and Acute-Care Surgical Patients. *J Am Osteopath Assoc*, 118(12):789-797. doi: 10.7556/jaoa.2018.171
22. Zerhouni YA, Krupka DC, Graham J, Landman A, Li A, Bhatt DL, Nguyen LL, Capatch K, Concheri K, Reich AJ, Wilson N, Weissman JS. (2018 Nov.). UDI2Claims: Planning a Pilot Project to Transmit Identifiers for Implanted Devices to the Insurance Claim. *J Patient Saf*. doi: 10.1097/PTS.0000000000000543. [Epub ahead of print]
23. Clemmons AB, Orr J, Andrick B, Gandhi A, Sportes C, DeRemer D. (2018 Oct.). Randomized, Placebo-Controlled, Phase III Trial of Fosaprepitant, Ondansetron, Dexamethasone (FOND) Versus FOND Plus Olanzapine (FOND-O) for the Prevention of Chemotherapy-Induced Nausea and Vomiting in Patients with Hematologic Malignancies Receiving Highly Emetogenic Chemotherapy and Hematopoietic Cell Transplantation Regimens: The FOND-O Trial. *Biol Blood Marrow Transplant*, 24(10):2065-2071. doi: 10.1016/j.bbmt.2018.06.005
24. Rosenberg-Yunger ZRS, Verweel L, Gionfriddo MR, MacCallum L, Dolovich L. (2018 Oct.). Community pharmacists' perspectives on shared decision-making in diabetes management. *Int J Pharm Pract*, 26(5):414-422. doi: 10.1111/ijpp.12422
25. Storlie CB, Branda ME, Gionfriddo MR, Shah ND, Rank MA. (2018 Oct.). Prediction of individual outcomes for asthma sufferers. *Biostatistics*, 19(4):579-593. doi: 10.1093/biostatistics/kxx055
26. Briddell JW, Riexinger LE, Graham J, Ebenstein DM. (2018 Sept.). Comparison of Artificial Saliva vs Saline Solution on Rate of Suture Degradation in Oropharyngeal Surgery. *JAMA Otolaryngol Head Neck Surg*, 144(9):824-830. doi: 10.1001/jamaoto.2018.1441
27. Castelli G, Bacci J, Difilippo A, Osborne MA, Dombrowski SK, McGivney MS, Klatt PM. (2018 Sept.). Pharmacist Delivered Comprehensive Medication Management within Family Medicine Practices: An evaluation of the SCRIPT Project. *Fam Med*, 50(8):605-612. doi: 10.22454/FamMed.2018.391124

28. Knoer S, Swarouth MD, Sokn E, Vakharia N, Pfeifferberger T, **Greskovic GA**, Kelley L, Thompson A, Achey T, Calabrese S. (2018 Sept.). The Cleveland Clinic Pharmacy Population Health Management Summit. *American Journal of Health-System Pharmacy*, 75(18):1421-1429. doi: 10.2146/ajhp180081
29. Maeng DD, **Graham J**, Bogart M, Hao J, **Wright EA**. (2018 Sept.). Impact of a pharmacist-led diabetes management on outcomes, utilization, and cost. *Clinicoecon Outcomes Res*, 10:551-562. doi: 10.2147/CEOR.S174595
30. **Jones LK**, Kulchak Rahm A, Manickam K, Butry L, Lazzeri A, Corcoran T, Komar D, Josyula NS, Pedergrass SA, Sturm AC, Murray MF. (2018 Aug.). Healthcare Utilization and Patients' Perspectives After Receiving a Positive Genetic Test for Familial Hypercholesterolemia: A Pilot Study. *Circulation: Genomic and Precision Medicine*, 11(8). doi: 10.1161/CIRCGEN.118.002146
31. **Gionfriddo MR**, Branda ME, Fernandez C, Leppin A, Yost KJ, Kimball B, Spencer-Bonilla G, Larrea L, Nowakowski KE, Montori VM, Tilburt J. (2018 July). Comparison of audio vs. audio + video for the rating of shared decision making in oncology using the observer OPTION5 instrument: an exploratory analysis. *BMC Health Serv Res*, 18(1):522. doi: 10.1186/s12913-018-3329-x

Other scholarly work

1. **Kheloussi SS**. Considerations in the Approach to Appropriate Statin Selection. *U.S. Pharmacist*, 2018;43(7);22-26.
2. Scheinman S, Shoemaker M, Amin A, Barker S, Baron S, Bennett M, Chenot T, Cole A, Fleischer L, Glunk D, Greiner P, Holdaway J, Jordan R, Kiani J, Lacey T, Iobst W, Longley A, Miller K, Reinheimer W, Selassie R, **Slampak-Cindric A**, Szarek J, Thompson M, Woll N. Actionable Patient Safety Solutions (APSS) #17: Patient safety curriculum. Patient Safety Movement Foundation, March 2019. Available at: <https://patientsafetymovement.org/actionable-solutions/challenge-solutions/patient-safety-curriculum/>.
3. **Wright E, Evans M, Kern M, Gionfriddo M**. How Geisinger Health System Reduced Opioid Prescriptions. *Harvard Business Review*, November 19, 2018. Available at: <https://hbr.org/2018/11/how-geisinger-health-system-reduced-opioid-prescriptions>
4. Smith G, **Tusing L**. Making Rivers and Communities Healthier. Pennsylvania *Angler & Boater*, July/August 2018. Available at: <https://www.fishandboat.com/Transact/AnglerBoater/AnglerBoater2018/JulyAugust/Documents/09making.pdf>
5. Khurana S, **Gaines S**, Lee TH. Enhanced Cure Rates for HCV: Geisinger's Approach. *NEJM Catalyst*, July 11, 2018. Available at: <https://catalyst.nejm.org/geisinger-provencare-hcv-cure/>

Featured articles

Lorraine Tusing featured in the *Williamsport Sun-Gazette's* article, "Medication take-back programs on the rise." (June 16, 2019)

Michael Evans featured in Danville's *The Danville News'* article, "Highmark, Geisinger address steps to combat opioid abuse." (May 14, 2019)

Lorraine Tusing featured in Shamokin's *The News-Item's* article, "North'd County host of five Geisinger drug take-back sites." (April 26, 2019)

Adrienne Zook featured in Geisinger's Commitment to Caring Series on our Geisinger Exchange for her efforts in finding the right approach to care for a patient with diabetes. (March 12, 2019)

Eric Wright featured in *The Shelby Report's* article, "Geisinger Expands Medication Take-Back Program In Weis Pharmacies." (October 31, 2018)

Eric Wright featured in Shamokin's *The News-Item's* article, "Geisinger Health expands their medication take-back program in Weis Markets pharmacies: Shamokin, Coal Township, Sunbury stores now included." (October 30, 2018)

Eric Wright featured in Sunbury's *The Daily Item* and Danville's *The Danville News'* article, "Geisinger expands medication take-back sites in Weis pharmacies." (October 29, 2018)

Gerard Greskovic featured in the *U.S. News & World Report's* article, "Joining the Opioid Battle." Available at: <https://www.usnews.com/news/healthiest-communities/articles/2018-10-04/hospitals-join-the-battle-against-opioids> (October 4, 2019)

Michael Gionfriddo featured in Advancing the Science, Mayo Clinic's Medical Science Blog, titled "Setting tomorrow's clinical researchers up for success." Available at: <https://advancingthescience.mayo.edu/2018/09/05/setting-tomorrows-clinical-researchers-up-for-success-draft/> (September 5, 2018)

Presentations

Invited presentations

1. Greskovic, G. Webster, LA. Troutman, J. Thomas, T. (2019, May). *Best practices in opioid prescribing convening*. Cardinal Health Foundation, Dublin, Ohio.
2. Hunsicker KD, Fisher DY. (2019, May). *Strengthening your pharmacy and clinical partnerships*. Health Plan Alliance Pharmacy Summit, Irving, Texas.
3. Evans MA, Miller JL. (2019, April). *Battling the opioid epidemic together: collaborating with an innovative integrated health services organization to reduce opioid overutilization*. Impact 2019– MedImpact Annual Conference, La Costa, Calif.
4. Gaines S. (2019, April). *Optimizing hepatitis c treatments*. PA Public & Community Health Annual Conference, Lancaster, Pa.
5. Brady J. (2019, March). *A change of heart: transforming diabetes management*. 10th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, Pa.
6. Piper B. (2019, March). *Thinking critically about the opioid epidemic*. The Opioid Epidemic: Research, Clinical, & Legal Perspectives, Penn State, Scranton, Pa.
7. Potts J, Vartanian A. (2019, March). *Evaluation of Kcentra® protocol for safety outcomes*. 10th Annual Medication Safety Conference, Wilkes-Barre, Pa.
8. Webster LA. Guza, K. (2019, March). *How-To-Series: Reliably and S.M.A.R.Tly Operationalize Best Practices for Reducing Opioid Prescriptions*, Premier HIIN Webinar.
9. Andrick B. (2019, February). *Vaccine Update: Focus on Varicella-Zoster & Influenza Vaccines*, Transplantation & Cellular Transplant Meetings of ASBMT™ and CIBMTR®, Houston, Texas.
10. Wright E, Rockey J. (2019, February). *MedTrue™-Geisinger & Merck*. 2019 HIMSS Global Conference & Exhibition, Orlando, Fla.

11. Bigart M, Dombrowski SK, Gionfriddo MR. (2019, January). *Geisinger at Home: A multidisciplinary primary care effort to care for patients with high healthcare utilization*. Pennsylvania Pharmacists Association Midyear Meeting, Gettysburg, Pa.
12. Dombrowski SK. (2019, January). *Conquering clinical precepting: 1 minute at a time*. Pennsylvania Pharmacists Association Midyear Meeting, Gettysburg, Pa.
13. Greskovic GA. (2018, December). *Ask the Pharmacist*. Special edition of WVIA Television's Call the Doctor series. Panelist.
14. Greskovic GA. (2018, November). *Role of Pharmacists in the ACO*. NAACOS (National Association of Accountable Care Organizations) Webinar.
15. Jones L. (2018, November). *Implementation science approaches to improve patient and provider interactions within a health system*, NIH National Heart, Lung, and Blood Institute's Reducing the Population Burden of Familial Hypercholesterolemia (FH): A Prototype for Translation Research and Implementation Science in Genomics and Precision Medicine, Bethesda, Md.
16. Dombrowski SK. (2018, October). *The growing future of diabetes: insulin pump therapy in type 1 and 2 diabetes*. Pennsylvania Pharmacists Association Midyear Meeting, Lancaster, Pa.
17. Osborne MA, Dombrowski SK. (2018, October). *Preparing your CV*. Pennsylvania Pharmacists Association Midyear Meeting, Lancaster, Pa.
18. Smith JI, Webster LK. (2018, October). *Understanding chronic pain*. Mid Counties Optometric Society, State College, Pa.
19. Webster LA. (2018, October). *Understanding addiction*. Pennsylvania Optometric Association Continuing Education Lecture, State College, Pa.

Didactic lectures

1. Shumlas L, **Kheloussi SS**. *Optimizing Use of Biologic DMARDs in Rheumatoid Arthritis*. Power-Pak C.E. (May 2019)
2. Evans M, Guza K, Webster L. *Health System Strategy to Address the Opioid Crisis*. Premier HIIN Webinar. (March 2019)
3. **Slampak-Cindric A**. *Pharmacotherapy of Contrast Media*. Geisinger Medical Center School of Radiologic Technology, Danville, Pa. (February 2019)
4. **Slampak-Cindric A**. *Introduction to Pharmacology*. Geisinger Medical Center School of Radiologic Technology, Danville, Pa. (January 2019)
5. **Slampak-Cindric A**. *Pharmacotherapy of Analgesia*. Geisinger Medical Center School of Radiologic Technology, Danville, Pa. (January 2019)
6. Boyer A, **Kheloussi SS**. *Say What? Techniques for Effective Communication*. Pharmacy Times Continuing Education. (November 2018)
7. **Slampak-Cindric A**. *Nursing Considerations for Geriatric Care: Pharmacy Edition*. Bloomsburg University School of Nursing, Bloomsburg, Pa. (October 2018)
8. **Kheloussi SS**. *Evidence-Based Management of Chronic Hyperkalemia: A Case-Based Approach*. Power-Pak C.E. (September 2018)

Internal presentations

1. Andrick B. *Vaccines for HCT: an update on varicella zoster & influenza vaccines*. CPIO CE Lunch and Learn, Skype Meeting. (June 2019)
2. Gionfriddo MR. *Big data*. CPIO CE Lunch and Learn, Skype Meeting. (June 2019)
3. Brokenshire AL. *The sweet side of cardiology – diabetes drugs with cardiovascular benefit*. Cardiology Morning Fellows Conference, Geisinger Medical Center, Danville, Pa. (May 2019)
4. Farnham KM, Topolewski CM, Barrese MA. *Stroke medication clinical pearls*. 2nd Annual Geisinger Stroke Symposium, Geisinger Medical Center, Danville, Pa. (May 2019)
5. Tusing L, Gregor C. *An introduction to qualitative research*. CPIO CE Lunch and Learn, Skype Meeting. (May 2019)
6. Webster LA, Evans, M, Wright, EA. *Geisinger's initiatives on opioids*. Human Resources System Meeting, Danville, Pa. (May 2019)
7. Baughman A. *Vitamins, plants and essential oils: a complementary and alternative medication update*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
8. Bones HL. *2018 New drug update*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
9. Diehl K. *Cardiovascular potpourri: updates on aspirin, hyperlipidemia, advanced cardiac life support and more*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
10. Dombrowski SK. *Updates in diabetes and hypertension treatment: guidelines & options*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
11. Hoch J. *Medication update: treatment of opioid use disorder*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
12. Marjoncu D. *Adventures in bone marrow transplant*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
13. Slampak-Cindric A. *Sepsis, pain, agitation and delirium: an intensive care extravaganza*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
14. Unger H. *Immunization palooza: vaccination snapSHOTs and influenza updates*. Fresh Pharm: A Medication Update Conference, Geisinger Medical Center, Danville, Pa. (April 2019)
15. Graham J. *Biostatistics v. intuition: dawn of justice*. CPIO CE Lunch and Learn, Skype Meeting. (March 2019)
16. Webster LA. *Benefits of pharmacist managed chronic disease programs*. Centre County Provider Retreat, State College, Pa. (March 2019)
17. Slampak-Cindric A. *Poisonings and overdoses: pharmacology of toxicology*. Geisinger Medical Center ACPE Accredited Critical Care Medicine Fellowship Lecture Series, Geisinger Medical Center, Danville, Pa. (February 2019)
18. Schlottmann O. *Pharmaceutical supply chain and transparency issue*. CPIO CE Lunch and Learn, Skype Meeting. (January 2019)
19. Slampak-Cindric A. *Debates in therapeutics*. Froberger Lecture Series, Temple University School of Medicine and Philadelphia College of Osteopathic Medicine Medical Student Education, Geisinger Medical Center, Danville, Pa. (December 2018)
20. Brokenshire AL. *LVAD education for clinical pharmacists*. Inpatient Pharmacists Group, Geisinger Medical Center, Danville, Pa. (November 2018)
21. McLay W. *Pharmacist patient care process*. CPIO CE Lunch and Learn, Skype Meeting. (November 2018)
22. McLay W. *Geisinger at Home introduction*. CPIO CE Lunch and Learn, Skype Meeting. (November 2018)
23. Slampak-Cindric A. *Nurturing collaboration in health profession students*. Caring Together: Interprofessional Education for Optimal Patient Care Conference, Geisinger Medical Center, Danville, Pa. (November 2018)

24. Slampak-Cindric A. *IHI model for improvement: setting aims and testing changes*. Geisinger Medical Center Interprofessional Quality Improvement Course, Geisinger Medical Center, Danville, Pa. (November 2018)
25. Andrick B. *BMT pharmacy primer*. CPIO CE Lunch and Learn, Skype Meeting. (October 2018)
26. Maiers T. *Oral chemotherapy*. CPIO CE Lunch and Learn, Skype Meeting. (October 2018)
27. Horger S, Smith JI. *Opioid and benzodiazepine weaning*. 10th Annual Pain Symposium, Geisinger Medical Center, Danville, Pa. (October 2018)
28. Webster, LA. *Understanding addiction*. Geisinger Nurse Practitioner Conference, Geisinger Medical Center, Danville, Pa. (October 2018)
29. Webster, LA. *Risks of benzo and opioid prescribing*. Lewistown/Mifflin County Provider Meeting, Lewistown, Pa. (October 2018)
30. Burton M. *Nudges in healthcare*. CPIO CE Lunch and Learn, Skype Meeting. (August 2018)

Posters

1. **Baughman A**, Anderson C, Anspach T, Choe L, Follett L, Bills A, Coyle L, **Slampak-Cindric A**, James C, Leisenring T, Hess A. (2019, May). *Aromatherapy use for post-operative nausea and vomiting for patients undergoing same-day surgeries*. Poster presented at Geisinger's 25th Annual Resident and Fellow Scholarship Days, Danville, Pa.
2. **Gionfriddo MR**, Castor S, Elder N, Fruscianta KL, Kaledas WR Jr, Kern MS, Schlottmann O, Wright EA. (2019, April). *MedTrue™: Triangulating patient reported data with EHR and claims data to create accurate medication lists and facilitate conversations*. Poster presented at 25th Annual Health Care Systems Research Network Conference, Portland, Ore.
3. **Butler SM, Maiers SH, Draus S, Talerowski LA, Nissen K, Gajkowski E**, General J. (2019, March). *Impact of critical low restock report utilization to reduce automated dispensing cabinet stockouts and delayed doses in a children's hospital*. Poster presented at 10th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, Pa.
4. **Falzone A, Scavo P**. (2019, March). *Lean project: dispensing of unfractionated heparin in hemodialysis patients at Geisinger Wyoming Valley Medical Center*. Poster presented at 10th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, Pa.
5. **Grassi D, Graham J, Kern M, Sharry-Rogers A, Nathanson D, Esch M, Chronowksi J, Evans M, Sartori M**. (2019, March). *Patient safety outcomes using a ProvenCare® model for multiple sclerosis patients on disease modifying therapies*. Poster presented at 10th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, Pa.
6. **Moore J, Siebold K, Hawn M, Drennen C**. (2019, March). *Medication utilization evaluation of intravenous dextrose at Geisinger Medical Center*. Poster presented at 10th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, Pa.
7. **Potts J, Vartanian A**. (2019, March). *Evaluation of Kcentra® protocol for safety outcomes*. Poster presented at 10th Annual Current Concepts in Medication Safety Conference, Wilkes-Barre, Pa.
8. Askey K, Stabinski M, **Hale SF, Slampak-Cindric A**. (2018, December). *Antithrombin utilization and monitoring within an integrated health system*. Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
9. **Delos Reyes S, Whittaker C, Liu S, Trivedi P, Reilly J**. (2018, December). *Evaluation of the development of acute kidney injury in patients receiving piperacillin-tazobactam with concomitant vancomycin or telavancin*. Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.

10. **Diehl K, Hale SF, Kay H.** (2018, December). *Buprenorphine use within acute care hospitals: a medication use evaluation.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
11. **Hadad G, Nguyen H, Nhan E,** Garrett S, **Reilly J.** (2018, December). *Strategic implementation of appropriate oritavancin utilization at a community teaching hospital: spending money to save money and improve quality of care.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
12. Hesse M, **Liu S, Erb R, Karcheski T, Reilly J.** (2018, December). *Dapsone-induced methemoglobinemia treated with oral cimetidine: a case report.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
13. **Higgins L, Munir N,** Walega L, **Vuong R, Walters R, Reilly J.** (2018, December). *Latex allergy in hospitalized patients: a quality improvement initiative with dietary restrictions for patient safety.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
14. Mauriello C, **Whittaker C, Patel K, Fields D, Reilly J.** (2018, December). *Heparin induced thrombocytopenia post-orthopedic surgery with a single dose of heparin in a patient with polycythemia vera.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
15. **Obciana J, Barner R, Nguyen H, Reilly J,** Trivedi M. (2018, December). *Treatment of acute bacterial skin and skin structure infections (ABSSSIs) with delafloxacin: a case series.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
16. Pagliaro A, Storb M, **Woloszczuk L,** Downham G, Reilly J. (2018, December). *Clinical evaluation of carbapenem resistant enterobacteriaceae (CRE) infections in a community teaching hospital.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
17. **Szymborski S,** Erb R, Vuong K, **Nguyen H, Reilly J.** (2018, December). *Evaluation of a pharmacist-managed vancomycin protocol in obese patients at a community teaching hospital.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
18. Unger H, **Hale SF, Slampak-Cindric A.** (2018, December). *Evaluation of naloxone and flumazenil as reversal agents in acute care hospital.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
19. **Waters B, Whittaker C, Nhan E, Reilly J,** Trivedi M. (2018, December). *Urinary tract infections at a community teaching hospital: an evaluation of outpatient treatment failures through the emergency department.* Poster presented at 2018 American Society of Health-System Pharmacists Midyear Clinical Meeting, Anaheim, Calif.
20. **Kheloussi SS.** (2018, October). *Use of alternative teaching methods to convey abstract concepts within a managed care elective course.* Poster presented at the Academy of Managed Care Pharmacy Nexus Meeting, Orlando, Fla.

Awards & recognitions

1st Place Poster Competition, 10th Annual Current Concepts in Medication Safety

Susan Butler, PharmD, BCPPS

Joseph Chronowski, MBA

Shannon Draus, PharmD, BCPPS

Callie Drennen

Michael Evans, RPh

Elizabeth Gajkowski

Jove Graham, PhD

Dante Grassi, PharmD, BCPS

Melanie Hawn

Melissa Kern, MPH

S. Henna Maiers, PharmD, BCPS

Jordan Moore, PharmD, BCPS

Kim Nissen, RPh, BCPPS

Melissa Sartori, PharmD

Amanda Sharry-Rogers, PharmD, BCPS

Kelsey Siebold, PharmD, BCPS

Leslie Taleroski, PharmD, BCPPS

2018 Literature Award for Innovation in Pharmacy Practice, ASHP Foundation

Jones L, Greskovic G, Grassi DM, Graham J, Sun H, Gionfriddo M, Murray M, Manickam K, Nathanson D, Wright E, Evans M. (2017 Sept.). Medication therapy disease management: Geisinger's approach to population health management. *Am J Health Syst Pharm*, 74(18):1422-1435. PMID: 28887344

2019 Early Career Investigator, Health Care Systems Research Network

Michael Gionfriddo, PharmD, PhD

Preceptors of the Year, Geisinger Pharmacy Residency Program

Michael Barrese, PharmD, BCCCP, BCCP

Vanessa Markle, PharmD

Preceptor of the Year, Wilkes University 2018 American College of Clinical Pharmacy

Angela Slampak-Cindric, PharmD, BCPS, BCCCP



GMC PGY1 residents and residency director, from left to right: Melissa McGowan, Amanda Boyer, Amber Heffelfinger, Michael Barrese (preceptor of the year), Angela Slampak-Cindric (residency director; Wilkes University AACP Preceptor of the Year), Jessica Curtis, Kayla Hart



GWV PGY1 residents and residency director, from left to right: Jennifer Yannuzzi, Vanessa Markle (preceptor of the year), Jamie Kerestes (residency director), Krushna Shah

Board-certified pharmacists

The mission of the Board of Pharmacy Specialties (BPS) is to improve patient care through recognition and promotion of specialized training, knowledge and skills in pharmacy and specialty board certification of pharmacists.

BPS is recognized as the single agency that operates across the pharmacy profession to provide specialty certification of pharmacists. By documenting practitioners' readiness for expanding roles in the 21st century, it recognizes, sets standards for and provides certification in specific clinical specialties. Most importantly, it is above partisan interests and establishes independent, objective standards that are applied in a psychometrically sound, legally defensible process.

BPS certification is a voluntary process by which a pharmacist's education, experience, knowledge and skills in a particular practice area are confirmed as well beyond what is required for licensure.

We have 69 board-certified pharmacists in total.

Newly certified in 2018–2019:

Emily Black, PharmD, BCACP

Laura Brickett, PharmD, BCCCP

Shannon Burke, PharmD, BCPS

Hayley Kay, PharmD, BCPS

Michael Kachmarsky, PharmD, BCACP

Catherine Knapp, PharmD, BCACP

Tristan Maiers, PharmD, BCOP

Anupama Mathur, PharmD, BCOP

Amanda Popko, PharmD, BCACP

Ivan Puskovic, PharmD, BCACP

Julia Swigart, PharmD, BCACP

Nicole Williams, PharmD, BCPS

Board-certified cardiology pharmacists (BCCP)

Michael Barrese

Board-certified geriatric pharmacists (BCGP)

Kimberly Carozzoni

Board-certified oncology pharmacists (BCOP)

Benjamin Andrick

Tristan Maiers

Anupama Mathur

Rachel Sneidman

Board-certified pharmacotherapy specialists (BCPS)

Emily Black	Danielle Karaffa	John Nahas
Kelly Bolesta	Hayley Kay	Shea Payne
Robert Boyle	Joan Keehan	Ivan Puskovic
Amy Brokenshire	Sarah Knauer	Ricky Rampulla
Michelle Budzyn	Eric Kowalek	Amanda Sharry-Rogers
Shannon Burke	Danielle Kuhn	Kelsey Siebold
Darlene Chaykosky	Bradley Lauver	Sarah Siemion
Laura Eap	Frederick Leri	Brian Simpkins
Alyssa Falkowski	Kimberley Limouze	Angela Slampak-Cindric
Sara Gaines	Sara (Henna) Maiers	Sally Tice
Dante Grassi	Andrea DePalma Mayer	Constance Topolewski
Kelly Guza	Eryn Milius	Lindsey Uhrin
Arthur Jankowski	Jordan Moore	Nicole Williams

Board-certified ambulatory care pharmacist (BCACP)

Brian Bedwick	Catherine Knapp	Ivan Puskovic
Emily Black	Sarah Krahe-Dombrowski	Julia Swigart
Kimberly Carozzoni	Daniel Longyhore	James Taleroski
Michael Kachmarsky	Amanda Popko	Ariana Wendoloski

Board-certified advanced diabetes management (BCADM)

William Ehmann

Board-certified critical care pharmacists (BCCCP)

Anthony Alu	Darlene Chaykosky	Kimberley Limouze
Michael Barrese	Jamie Kerestes	Angela Slampak-Cindric
Laura Brickett	Kayla Kotch	

Board-certified nutritional support pharmacists (BCNSP)

Stephen Adams	Mariya Monfette	Carl Naessig
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Board-certified pediatric pharmacy specialists (BCPPS)

Susan Butler

Sarah Hale

Kimberly Nissen

Shannon Draus

Joan Keehan

Bryan Snook

Kelly Guza

Michelle Ligotski

Leslie Taleroski

Pharmacy leadership



Names from left to right:

Charles Arrison, Holly Bones, Daniel Longyhore, Jamie Miller, Gerard Greskovic, Dean Parry, Dave Klinger, Kelly Guza, and Mike Evans

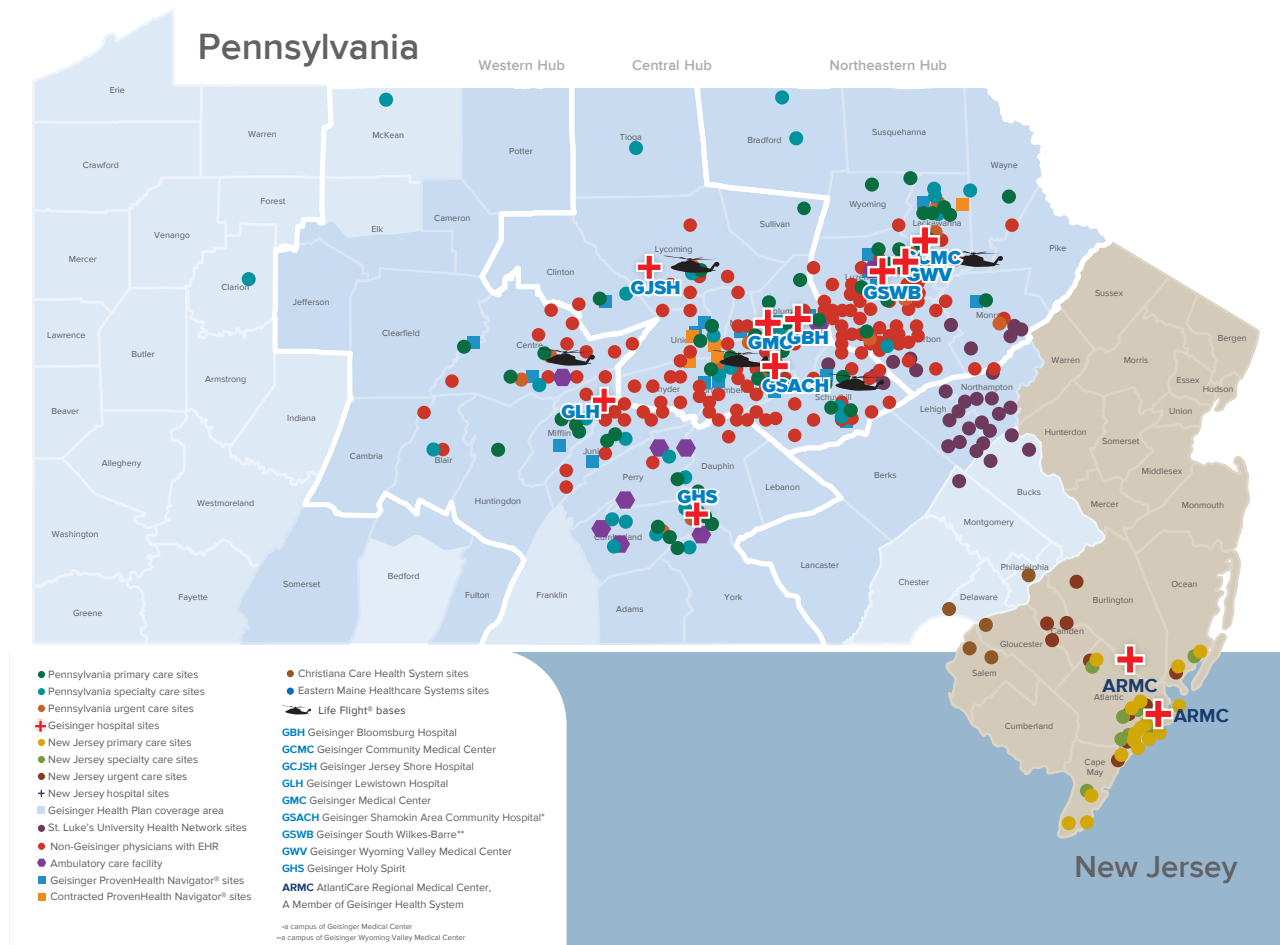


Names from left to right:

Row 1 (front): Nicole Williams, Ethan Nhan, Steven Moscola, Charles Arrison, Dave Klinger, Bryan Szuler, Matthew Krah, Jenny Plummer, Ann Marie Petrochko, Gerard Greskovic, Kelly Guza
Row 2: Beth Denicola, Stephanie Piemontese, Nathaniel Roberts, Bryan Snook, Carl Naessig, Jamie Kerestes, Michelle Budzyn, Vanessa Markle, Barbara Fowler, Kelly Bolesta, Gregory Hood
Row 3: Patricia Wascavage, Christine Neary, Deanna Drabant, Ronald Zsido, Dean Parry, Melissa Kern, Jove Graham, Dina Sandri, Sarah Krahe-Dombrowski, Colleen Rogers, Jack Payne
Row 4: Frederick Leri, Daniel Longyhore, Brian Simpkins, Cory Ulisse, Lucille Yetter, Susanne Burns, Amanda Popko, Jonathan Brady, Seth Gazes, James Petrochko, Benjamin Andrick
Row 5: Jamie Miller, David Griffith, Kristen Bender, Kimberly Clark, Adriene Zook, Michael Kessock, Stacey Grassi, Diane Polombo, Alysha Lopez, Durga Zally, Gayle Boyer
Row 6: Heather Scanlon, Sally Tice, Jordan Moore, Bradley Lauver, Ranya Grzyboski, Leonard Learn, Jeremy Scott, Angela Slampak-Cindric, Stephanie Gill, Sarah Hale, Holly Bones
Row 7: Mariya Monfette, Ashley Williams, Julia Gregoire, Beth Thomson, Heather Goynes, Jason Howay, Michael Evans
Not pictured: Stephen Adams, Hank Aftewicz, Anthony Alu, Karen Andreoli, Lisa Ashman, Raymond Besecker, Candy Chesnick, David Day, Louann Domenico, Sabra Douthit, Kathleen Fanzo, Alison Flango, Keith Gilbert, Leonard Guarna, Timothy Guschel, Laura Hart, Joanne Heffner, Allyson Hess, Kayla Kotch, Susan Lorenzetti, Frank Mellace, Walter Mieczkowski, Shea Payne, Jonas Pearson, Tristan Sadowski, Rachel Sneiderman, Deborah Templeton, Leeann Webster, Nicole Williams, Eric Wright, Denise Zdancewicz

About Geisinger

One of the nation's most innovative health services organizations, Geisinger serves more than 1.5 million patients in Pennsylvania and New Jersey. The system includes 13 hospital campuses, a nearly 600,000-member health plan, two research centers and the Geisinger Commonwealth School of Medicine. A physician-led organization, with approximately 32,000 employees and more than 1,800 employed physicians, Geisinger leverages an estimated \$12.7 billion positive annual impact on the Pennsylvania and New Jersey economies. 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 or connect with us on Facebook, Instagram, LinkedIn and Twitter.



Geisinger is one of the largest integrated health systems in the United States, serving approximately 1.5 million patients. The physician-led system employs more than 30,000 people, including an 1,837-physician member multispecialty group practice. Geisinger comprises 13 hospital campuses, 2 research centers, an alcohol and chemical dependency treatment center, a school of medicine and an insurance provider (GHP).

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 1,800 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 northeast Pennsylvania, GMC has earned a reputation for providing leading-edge medicine and treating the most critically ill patients. GMC is licensed for 524 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 Woodbine Lane campus.

GMC’s Hospital for Advanced Medicine serves as an integrated center for the most critically ill patients. This 308,000-square-foot “hospital within a hospital” houses 9 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 new 32,000-square-foot 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. GSACH merged into Geisinger Medical Center on Jan. 1, 2012. GSACH, a campus of Geisinger Medical Center, has a total of 48 beds, including 30 Med/Surg beds, 10 Post-Surgical Unit beds, 7 Special Care Unit beds and 1 bed in the year-old 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 northeast Pennsylvania. Licensed for 272 beds, GWV’s state-of-the-art Critical Care Building houses the only Level II 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 more. It also has a newly opened Emergency Department.

Geisinger Community Medical Center (GCMC) – Scranton, Pa. GCMC is a leading provider of quality healthcare services in northeast 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 72 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. Its Emergency Department is ranked in the top 5 percent in the state.

Geisinger Lewistown Hospital (GLH) – Lewistown, Pa. GLH is licensed for 124 beds and serves the residents of rural Mifflin, Juniata, Perry, Snyder and Huntingdon counties. It is an open-staff, acute-care community hospital that partners with Primary Health Network FQHC to provide services in the new Primary Health Network facility in the Lewistown area. GLH offers emergency, imaging, endoscopy, urgent care, 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 Holy Spirit (GHS) – Camp Hill, Pa. Geisinger Holy Spirit affiliated with Geisinger in 2014 and is licensed for 311 beds. GHS provides a wide variety of clinical programs including inpatient, outpatient, wellness and community services, and operates a Level II trauma center. It features a state-of-the-art Gamma Knife radiosurgery system and has launched an endobronchial ultrasound program and a comprehensive bariatric surgery program.

AtlantiCare Health System (AHS) – Atlantic City, N.J. AHS became a member of Geisinger in October 2015. AHS is an integrated system of services designed to help people achieve optimal health in Atlantic, Burlington, Camden, Cape May, Cumberland, and Ocean Counties in southern New Jersey. AHS is composed of AtlantiCare Regional Health Services, including AtlantiCare Regional Medical Center in three locations, ambulatory services, and AtlantiCare Physician Group; the AtlantiCare Foundation; and AtlantiCare Health Solutions, an accountable care organization.

The region’s largest healthcare organization and largest non-casino employer, AHS’s more than 5,500 employees and 900 physicians and providers serve the community in more than 90 locations. AHS and its business units are governed by boards composed of volunteer community leaders.

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 about 580,000 members in 43 counties throughout central, south-central and northeast Pennsylvania, as well as members in New Jersey and Maine. The provider network includes 45,000 participating providers and 130 participating hospitals. Additionally, GHP has partnered with Centers for Medicare & Medicaid Services (CMS) to provide Medicare benefits to 95,000 beneficiaries in the state. GHP also provides coverage to 184,000 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, located in Danville, Pa.; the Susquehanna Valley Imaging Center, located in Lewisburg, Pa.; and the Geisinger Precision Health Center, located in Forty Fort, Pa.

Geisinger Commonwealth School of Medicine (GCSOM)

– Scranton, Pa. GCSOM joined the Geisinger family in January 2017. Formerly The Commonwealth Medical College, GCSOM has campuses in Scranton, Wilkes-Barre, Williamsport and Sayre, Pa. The school is accredited by the Pennsylvania Department of Education to accept students for Master of Biomedical Sciences and Doctor of Medicine degree programs.

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. GCHS programs include:

- Geisinger Careworks urgent care, 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

Geisinger Life Flight® is a component of the system's response to critical care transport needs, with 9 air ambulances and 1 ground ambulance operating 24 hours a day, 7 days a week from the following locations:

- Geisinger Medical Center, Danville
- 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 transported nearly 2,800 patients to the nearest qualified trauma center in FY18.

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 Alcohol & Chemical Dependency Treatment Center, located in Waverly, Pa., is recognized as a national leader in the treatment of alcohol and chemical addiction. Geisinger Marworth has 91 beds and provides 3 levels of treatment: outpatient, intensive outpatient with partial hospitalization, and inpatient detoxification and rehabilitation.





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