

A YEAR OF INNOVATION



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Message from Chief Pharmacy Officer

Christine M. Collins, MBA, RPh, FASHP

Senior Vice President, Pharmacy and Perioperative Services,
Brown University Health

Intrinsic motivation. That's what comes to mind as I read through the accomplishments outlined in this year's annual report. Implementing new initiatives not because something is broken, but because you think it can be made better. Improving a process not because someone said to, but because you think it can be improved. Striving for the highest level of quality, efficiency, and effectiveness on a continuous cycle. Embracing innovation for the fun of innovating. This internal drive to be high performing translates to a powerful culture of intrinsic motivation across our pharmacy enterprise. With this strong foundation and our dedicated team, we will continue to be recognized as a national leader in pharmacy practice, and, most importantly, continue to achieve great things. Well done!

As we look to the future, there are many things to be excited about. A new name: Brown University Health. It is known near and far and certainly leaves a strong impression. And we have new members on our pharmacy team – the pharmacy staffs at our new Massachusetts locations, Morton Hospital and Saint Anne's Hospital. We've already started working diligently with them to integrate our services and build a stronger overall team. It has been great having them on board, and we look forward to having them as part of this annual report next year. We know they will have many accomplishments to share.

We also have many major projects that have kicked off and will be completed in the year ahead, including home infusion with a new infusion center, major renovations at Rhode Island Hospital, and a centralized retail services pharmacy. Not to mention many more expansion projects in the works.

I remain immensely proud of the incredible team we have. I am also very much indebted to our outstanding leadership team, without whom none of this would be possible. As I take on more responsibilities outside of pharmacy, it's great to know that the pharmacy team continues to thrive and is in the most capable of hands.

My sincerest thanks to all of you. Please take a moment to recognize your own contributions to our collective success during the past year, and consider the opportunities for you to contribute in the year ahead. Innovate for the thrill of innovation!

Christine M. Collins, MBA, RPh, FASHP

PHARMACY SERVICES OVERVIEW

Mission

To enrich our community’s health by providing exceptional and innovative pharmacy services.

Vision

To transform pharmaceutical care through innovation and adherence to the highest clinical standards.

Values

- Compassion** Delivering medications to patients with care and empathy.
- Excellence** Providing our patients with the safest, highest quality of care possible, continually improving our systems, and measuring our performance.
- Innovation** Committed to pursuing contemporary medication practices and engaging all pharmacy team members to be innovative thinkers.
- Integrity** Ensuring accountability and respect while adhering to the highest standards of morals and ethics.
- Teamwork** Working collaboratively across pharmacy services and with multidisciplinary care teams.

Click here to visit brownhealth.org/centers-services/pharmacy



Vincent Salerno, PharmD, Director of Retail Pharmacy Services; Christopher Nering, Pharmacy Data Science and Automation Team Lead; Karen Nolan, RPh, Director of Inpatient Pharmacy at Rhode Island Hospital; and Louis Palmisciano, Manager of Impact and Outcomes, attending the Vizient Conference in Anaheim, CA, December 2023.

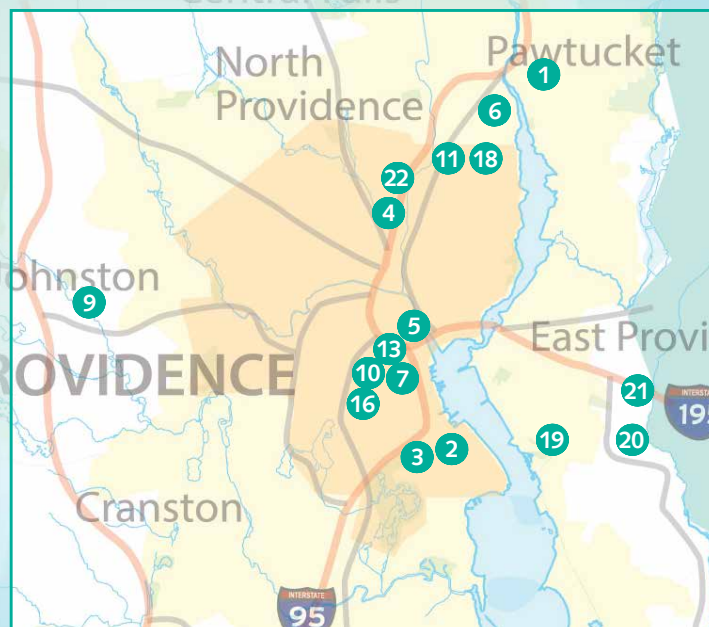
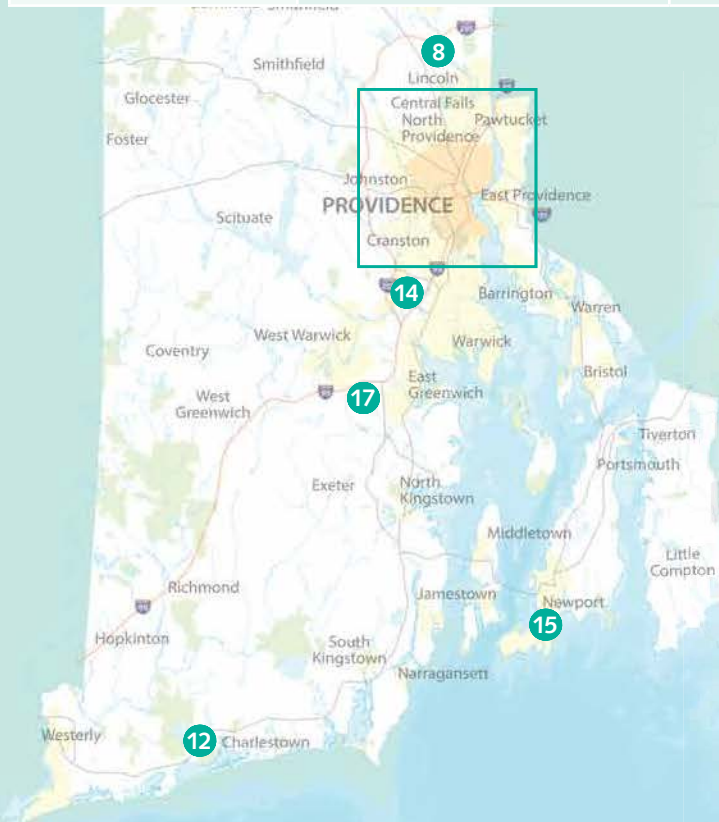
LOCATIONS MAP

Ambulatory Clinical Pharmacy Services **Rx** Retail
BHCI Brown University Health Cancer Institute

Hospital

1	101 Bacon Street, Pawtucket	Gateway Healthcare, Inc	
2	245 Chapman Street, Providence	HC Medicine Pediatrics	
		RIH Endocrine	
		RIH Gastroenterology	
		RIH Hepatology	
		RIH Primary Care	
3	117 Chapman Street, Providence, RI	RIH Recovery Clinic	
		RIH Rheumatology	
3	117 Chapman Street, Providence, RI	Brown University Health Specialty Pharmacy	Rx
4	180 Corliss Street, Providence	Brown University Health Pharmacy	Rx
4	180 Corliss Street, Providence	Corliss Street Clinic, TMH	
		Infectious Diseases and Immunology Center	
5	10 Davol Square, Providence	Brown Health Medical Group Primary Care	
6	407 East Avenue, Pawtucket	RIH Rheumatology	
7	593 Eddy Street, Providence	Hasbro Children's (HC)	
		HC Allergy and Asthma	
		HC Dermatology	
		HC Gastroenterology	
		HC Oncology & Hematology (Tomorrow Fund Clinic)	
		HC Pulmonary	
		HC Rheumatology	
		Brown University Health Pharmacy	Rx
		Cystic Fibrosis Center	
		Rhode Island Hospital (RIH)	
		RIH Behavioral Health	
		RIH Cardiology: Advanced Heart Failure, Electrophysiology	
		RIH Pulmonary	
		RIH Sickle Cell Center	

8	701 George Washington Highway, Lincoln	Brown University Health Cancer Institute, Lincoln	BHCI
9	1443 Hartford Ave, Johnston	Gateway Healthcare, Inc	
10	110 Lockwood Street, Providence	Brown Medicine Dermatology & Rheumatology	
		Brown University Health Cancer Institute, Rhode Island Hospital	BHCI
		RIH Hemostasis and Thrombosis Center	
		RIH Neurology	
		RIH Sickle Cell Center	
10	110 Lockwood Street, Providence	RIH Transplant Center	
11	1125 N. Main Street, Providence	TMH Infectious Diseases	
12	4705 Old Post Rd, Charlestown	Gateway Healthcare, Inc	
13	111 Plain Street, Providence	HC Endocrinology	
		Division of Genetics (Pharmacogenomics)	
14	1500 Pontiac Avenue, Cranston	RIH Rheumatology	
15	20 Powel Avenue, Newport	Brown University Health Cancer Institute, Newport Hospital	BHCI
15	20 Powel Avenue, Newport	Brown University Health Pharmacy	Rx
		Newport Hospital	
16	335 Prairie Avenue, Providence	Children's Neurodevelopment Center	
17	1454 South County Trail, East Greenwich	Brown University Health Cancer Institute, East Greenwich	BHCI
17	1454 South County Trail, East Greenwich	Brown University Health Cancer Institute, The Miriam Hospital	BHCI
		Brown University Health Pharmacy	Rx
		The Miriam Hospital (TMH)	
18	164 Summit Avenue, Providence	TMH Primary Care	
19	1011 Veterans Memorial Parkway, Riverside	Bradley Hospital	
20	375 Wampanoag Trail, East Providence	Brown Medicine Gastroenterology	
21	950 Warren Avenue, East Providence	Brown Health Medical Group Gastroenterology	
		Anticoagulation	
22	148 West River St., Providence	Center for Advanced Lung Care	
		Obesity Medicine Program	



KEY STATISTICS

Lifespan, the forerunner of Brown University Health, was Rhode Island's first health system, founded in 1994 by Rhode Island Hospital and The Miriam Hospital. A comprehensive, integrated, academic health system affiliated with The Warren Alpert Medical School of Brown University, its present partners also include Rhode Island Hospital's pediatric division, Hasbro Children's; Bradley Hospital; Newport Hospital; and Gateway Healthcare. Pharmacy Services are well integrated into these partners, along with Brown Health Medical Group.

310

Pharmacists

- 22 Pharmacists with advanced degrees (e.g., MBA, MPH, JD)
- 71 Pharmacists who are board-certified
- 7 Pharmacists who are dual board-certified
- 45 Pharmacists who have completed a PGY1 residency
- 44 Pharmacists who have completed both PGY1 and PGY2 residencies

226

Technicians

18

Pharmacy residents

- 8 residency programs
- 56% Percentage of residents who stayed with Brown Health after completing residency



Our Hospitals

- 17,412 Employees
- 1,165 Licensed beds
- 53 Pharmacy locations, including clinics with embedded pharmacist



Scholarship & Research

- 122 APPE/IPPE rotations completed
- 14 Scientific publications
- 13 Poster and platform presentations



Inpatient Pharmacy Services

Central Pharmacy Services

8,556,642 Doses dispensed

166,751 Compounded sterile products prepared



Medication Policy & Safety

~40% Percentage of staff-reported medication-related safety events that were “good catch” prevented errors, signaling a strong culture of reporting

3 Medication safety topics submitted to Institute for Safe Medication Practices (ISMP) that were published in nationwide Medication Safety Alert

>95% Medication barcode scanning rates (Leapfrog-defined units)

>98% Smart-pump infusion drug library compliance with Epic interoperability



Investigational Drug Services

165 Active protocols

2,220 Active dispenses



Ambulatory Pharmacy Services

>520,000 Prescriptions dispensed

>58,500 Unique patients

>99% Specialty patient satisfaction

9,467 Patients receiving clinical services

17 Collaborative practice agreements and protocols

>21,000 Benefits investigations performed

>12,000 Prior authorizations completed

132,000 Refill requests processed by Medication Access Program (MAP) team



Pharmacy Technology Team

>903,000 Controlled substance transactions evaluated, resulting in **97%** automated closure rate by diversion detection software, limiting need for manual review of transactions

125 Epic system improvements/maintenance requests completed per month

INPATIENT PHARMACY

Overview

The inpatient pharmacy services at Brown University Health now includes six specialized central pharmacy locations, an expansion from the previous four, following the system integration of Saint Anne's Hospital and Morton Hospital. All these locations provide comprehensive support for acute care pharmacy practices and advanced technology integration. Our pharmacists and pharmacy technicians collaborate closely with multidisciplinary teams to ensure the timely and accurate delivery of medications to hospitalized patients.

We take pride in this year's achievements, which include:

- **Carousel Dispensing Technology Implementation:** Implemented central pharmacy automation to increase efficiency, improve employee engagement, and minimize medication errors.
- **Medication Distribution Model Optimization:** Changed the way we dispense specific medications to reduce waste and improve medication availability.
- **Outcome Dashboard Development:** Built electronic dashboards to drive key performance indicator initiatives.

We also celebrate significant progress in employee engagement, as evidenced by the latest YourVoice survey results, leading to lower vacancy rates and reduced team turnover.

Rhode Island Hospital

- Expanded the system-wide medication history technician workforce to optimize workload and expand services to capture elective surgical patients. The remote medication history technicians within this group are on pace to complete 10 percent of system-wide medication histories in their first year.
- Implemented a new insulin multidose vial dispensing process which yielded a 90 percent decrease in related drug expenses for insulin glargine and insulin lispro, representing approximately \$440,000 in annualized savings.
- Implemented a best practice controlled substance waste management system.
- Optimized medication inventories in the automated dispensing cabinets, resulting in a 37.5 percent decrease in medication stockouts.
- Improved recruitment and retention in the pharmacy intern program, which has quadrupled in size with the incorporation of additional operational and clinical experiences.
- Collaborated with multiple service lines to perform successfully in The Joint Commission (TJC) survey.

The Miriam Hospital

- Implemented Omnicell carousel automation, improving product selection accuracy by 71 percent and decreasing median medication delivery times by 15 minutes.
- Optimized Omnicell Inventory to improve ready access to commonly used medication by 17 percent in patient care areas.
- Expanded pharmacy clinical services to our Family Medicine care team and expanded ICU clinical services to evenings.
- Insourced compounding of pharmacy batched product, reducing 503B drug spend by 52 percent.
- Optimized ready-to-use medication presentations, decreasing manipulation of doses on the floor before administration by 24 percent.
- Received maximum eight-year PGY1 Residency accreditation from American Society of Health-System Pharmacists (ASHP).



Members of the pharmacy team at The Miriam Hospital (left to right): Rita Bolarinho, CPhT; Sean Gilman, PharmD; Nelson Caetano, PharmD; and Courtney Witherell, CPhT.

Newport Hospital

- Implemented Omnicell carousel automation, improving product selection accuracy by 69 percent and time to complete order by 72 percent.
- Implemented Bluesight KitCheck technology, decreasing stockouts in ORs, delivery times, and turnover time for crash carts.
- Expanded pharmacist clinical services to include ICU daily rounding.
- Established technician specialist roles in operations and sterile compounding to provide career opportunities and increase retention.



Kelsey Eggeman, PharmD, removing medication from the Omnicell Carousel.

Bradley Hospital

- First in system to implement Omnicell Central Pharmacy Manager (CPM) technology.
- Collaborated on presentation for University of Rhode Island's annual Seminar by the Sea Northeast Regional Continuing Conference: "Mental health triad: caring for patients, ourselves, and each other."
- Assisted Newport Hospital in completing a comprehensive medication need assessment for their new adolescent psychiatric treatment program.

CLINICAL PHARMACY CARE SERVICES

Overview

Clinical pharmacists and clinical pharmacist specialists work collaboratively with the patient care team in a decentralized model. There is a decentralized pharmacist in every intensive care unit across the system, most of our emergency departments, and supporting most of our internal medicine teams.

Clinical specialists act as service line leads with highly trained, engaged, and motivated clinical pharmacists to provide unit-based services on adult and pediatric medical, surgical, critical care, emergency medicine, and specialty patient care units. Pharmacists participate in daily patient care rounds and provide pharmacotherapy management, Code Blue response, consultative services, order verification and select patient management by Pharmacy and Therapeutics Committee approved protocols.

Inpatient Oncology services have expanded from one clinical specialist to two to provide more comprehensive support to both the solid organ and the hematology oncology services. An inpatient psychiatry service line has been established by embedding a decentralized clinical specialist in our inpatient psychiatric units with the aim of improving psychotropic stewardship through therapeutic drug monitoring, managing medications for substance use disorder, and leading medication groups, as well as improving transitions of care for this vulnerable patient population. Hasbro Emergency Medicine services have expanded to provide increased hours of support during both AM and PM shifts. Antithrombotic stewardship services have expanded to provide comprehensive antithrombotic stewardship across the system.

Patient Care Services

- Expansion of pharmacy to dose warfarin.
 - RIH from 24.7% (September 2023) to 61.8% (August 2024) with a peak of 65.8% in May 2024
 - TMH from 62.9% (September 2023) to 70.2% (August 2024) with a peak of 77.4% in June 2024
 - NPH from 27.3% (September 2023) to 62.5% (August 2024) with a peak of 84.5% in April 2024
 - Program expansion resulted in a decrease in our Vizient INR >5 metric
 - » RIH 2024 YTD: 2.59%, decreased from 3.77% for 2023
 - » TMH 2024 YTD: 0.83%, decreased from 2.86% for 2023
 - » NPH 2024 YTD: 0%, decreased from 2.22% for 2023
- Development of blood glucose stewardship service line with associated reduction in Vizient hypoglycemia events (blood glucose <50 mg/dL after receipt of inpatient insulin).
 - RIH most recent quarterly metric was 0.86%, a reduction from previous quarters. The 2024 YTD rate is 1.06%, lower than the 2023 rate of 1.18%, putting RIH in the 90th percentile in their cohort (top decile performance).
 - TMH quarterly metric was 0.54%, giving it a 2024 YTD metric of 0.49%, putting it in the 91st percentile (top decile performance).
 - NPH had no hypoglycemic events meeting criteria during the quarter, giving it a 2024 YTD metric of 0.87%, putting it at ~85th percentile.
- Creation of prediction model that can predict patients who will have a hypoglycemic event in the future with an 86% sensitivity and specificity.

- Development of clinical guidelines and associated order sets for:
 - Opioid Use Disorder
 - Electrolyte repletion with associated nursing protocol
 - Emergency Department alcohol withdrawal
 - Pain management and discharge opioid taper
 - Management of extravasation
 - Anticoagulation reversal
 - Treatment of hyperkalemia
 - Adult subcutaneous insulin management and hypoglycemia
 - Sexual assault
 - Intrathecal pump
 - Dofetilide and sotalol initiation
- Development of new P&T subcommittees for ICU/ED and Pediatrics.
- New medication titration guideline, policy, and EMR changes (30 medication protocols, 20 order sets, 23 order panels, and 16 ED quick-pick list order sets) with resulting increase in TJC compliance audits from 65 to 97 percent.
- Alteplase to Tenecteplase Transition MUE.
 - Tenecteplase use was associated with a five-minute reduction in average door-to-needle (DTN) times for patients diagnosed with acute ischemic stroke (AIS).
 - Transition to tenecteplase resulted in a projected annual cost savings of \$197,000.

Pharmacy Transitions of Care

Our transitions in care pharmacists excel in ensuring quality, safety, and patient satisfaction during high-risk inpatient discharges (i.e., heart failure, myocardial infarction, pneumonia). They perform meticulous medication reconciliation, patient counseling, and facilitate medication access to prevent hospital readmissions and patient harm.

They also play a pivotal role in patient education by providing individuals and their caregivers with the knowledge needed to understand and manage their medications effectively after transitioning to different care settings. This has led to increased adherence and fostered improved patient outcomes.

Educational Services

Our clinical pharmacists and clinical pharmacist specialists provide education during nursing and physician orientation, patient care rounds and conferences, and when serving as preceptors for the University of Rhode Island College of Pharmacy, Massachusetts College of Pharmacy and Health Sciences, Northeastern University School of Pharmacy, and the Brown Health pharmacy residency training programs.

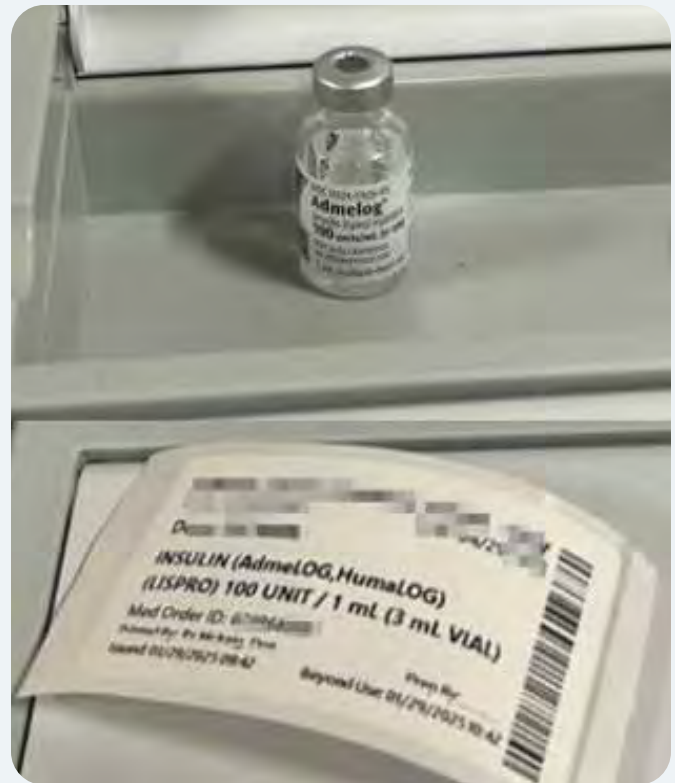
Many clinical pharmacist specialists hold adjunct positions at the Rhode Island College of Nursing graduate program and Johnson & Wales University physician assistant programs, where they teach advanced therapeutics. Infectious diseases clinical specialists and the inpatient clinical managers hold faculty positions at the Warren Alpert School of Medicine at Brown University and lecture in the Brown University radiation technology training program.

New Insulin Dispensing Model Is Successful At Reducing Waste

Insulin is in demand: today more than 10 percent of Americans have diabetes, and the vast majority must take insulin. Within busy hospitals, drug shortages, costs and waste are major concerns, including when it comes to insulin.

In 2023, throughout all Brown University Health hospitals, more than 13,000 requests for insulin were made—about 42 vials per day. Close inspection revealed approximately 90 percent waste for each vial of insulin dispensed. “We use a medication-dispensing machine, called Omnicell, which is how nurses have traditionally obtained the patient-specific dose of insulin,” explains Dalia Souto, RN, MSN, advanced practice manager.

In 2024, with the goal of reducing missing medication requests and costs, a new process was initiated. “Now the nurse enters the specific dose for each patient so that the pharmacy can track how much insulin was obtained,” says Souto, noting that the nurse no longer brings the vial into the patient’s room—just the syringe with a sticker carrying a barcode.



In 2024, a new process using Omnicell, medication-dispensing technology, was initiated and shown to be effective in reducing insulin waste and associated costs while improving patient safety.

“The information is documented, so pharmacy staff can see how much insulin is available. Each floor has its own Omnicell. They know if a vial is missing.”

Pharmacists and nursing staff worked together on the new process. “We needed to make sure the process would work in each facility,” Souto says. “For the month prior to beginning the new process, we did education with the staff so that they understood that the labels printed out by the Omnicell are what ensures patient safety—that is, the right medication at the right dose. It requires scanning the patient’s insulin vial.”

During the first week the new workflow went live, pharmacists were present on patient units, along with unit leadership, to troubleshoot and answer questions. The systemwide results for April were impressive: 88 percent reduction in average daily “request dose” requests, 95 percent reduction in average daily vial patient-specific dispenses from inpatient pharmacies, and 92 percent reduction in respective medication spending—annualized to \$660,000.

The new Omnicell insulin dispensing model has proven itself. “This is helping with the drug shortages that are occurring,” says Souto. “The fact is, some patients are unable to obtain insulin because of drug shortages. Then there’s the cost of drugs, which has gone up, similar to the cost of groceries. We focused on the amount of insulin we were wasting because we want to have enough for everybody—while also bringing down health care costs.”

INVESTIGATIONAL DRUG SERVICES (IDS)

During this past year, the implementation and optimization of nCoup has continued to be one of our major focus areas. This software integrates with our EMR, eliminates significant double-entry of data related to patient and protocols, and therefore reduces the associated risk of entry error. The software also allows transparent access for our sponsor monitors, facilitating scheduled remote audit visits.

During fiscal year 2024 we implemented the charging module of nCoup and successfully processed all of last year's charging quarters through nCoup. This module significantly streamlines the billing data collection and invoice processing for our billable protocols.

- Set up additional 100 protocols.
- Created 251 new drug entries.
- Affixed nCoup barcode inventory labels to each investigational drug received. This label encodes for the protocol and drug identifier, unique lot and kit number.
- 1,000 drug shipments were received (approximately five shipments processed in nCoup daily).
- 287 investigational patients were treated during FY24, resulting in a total of 2,625 dispensation transactions.
- 669 drugs were transferred from RIH LCI to Fain LCI.

In addition, we meet weekly with the oncology research team to optimize the investigational drug build and Epic Beacon treatment plan production. During FY24, we produced a total of 165 investigational treatment plans, approximately 10 percent more than last fiscal year.

The main IDS area at Rhode Island Hospital was renovated to support new equipment, including a permanent AC unit, an industrial refrigerator, two small freezers, updated storage areas and two computer workstations with double screens.

STERILE COMPOUNDING SERVICES

The Brown University Health pharmacy sterile compounding team coordinates and provides oversight for preparation of hazardous and non-hazardous sterile compounded medications, manages the compounding content for new sterile compounded medication builds, and ensures content remains current.

The sterile compounding team currently operates seven cleanrooms across the state of Rhode Island:

- Rhode Island Hospital, Main Pharmacy
- Rhode Island Hospital, BHCI
- The Miriam Hospital, Main Pharmacy
- The Miriam Hospital, BHCI
- Newport Hospital, Main Pharmacy
- East Greenwich, BHCI
- Lincoln, BHCI



Lauren Martinelli, CPhT, preparing an IV medication in the pharmacy clean room.

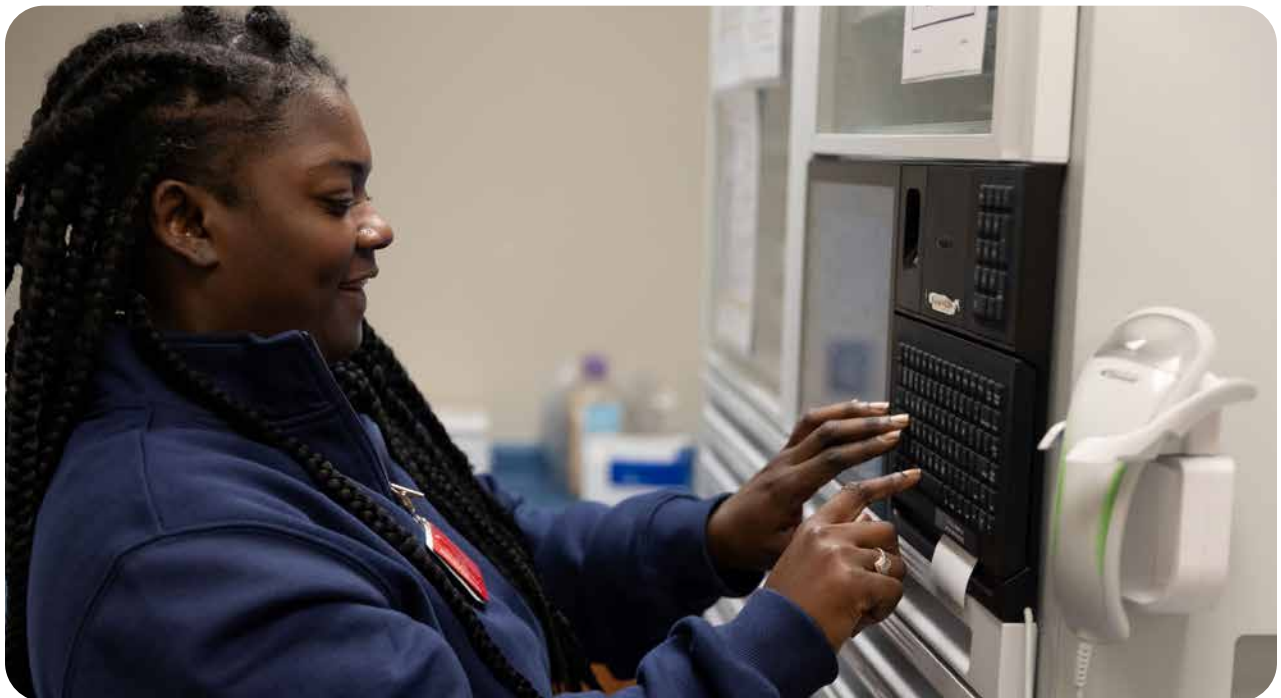
Major accomplishments during the 2024 fiscal year include:

- Expanded the oncology pharmacy service line, improving staff satisfaction while decreasing staff turnover rates.
- Built and implemented Epic's compounding and repackaging (CNR) module to improve workflows and patient safety.
 - CNR is used to produce batch compounds of sterile medications.
 - Incorporates barcode scanning of ingredients and camera technology.
- Successful implementation of USP 797 and 800 standards was a major achievement that ensured the highest level of safety and compliance in sterile compounding and hazardous drug handling. These improvements directly enhance patient and staff safety while aligning with industry best practices.
- Installed two new Baker EdgeGARD vertical laminar airflow compounding hoods within the RIH Main Pharmacy Cleanroom.
- Installed one new Baker EdgeGARD horizontal laminar flow clean bench in the Lincoln BHCI Pharmacy.
- Installed two new SterilGARD negative pressure biological safety cabinets within the Fain BHCI.
- Developed assessment of risk documents that encompass all aspects of the hazardous medication process, compliant with USP 800 regulations.
- Within Epic, improved the transparency and communication between pharmacy and clinical teams by displaying dispense actions on the Medication Administration Record (MAR).
- Initiated, in collaboration with the oncology team members, a Cellular Therapy Program for Brown Health, which continues to grow, offering cutting-edge treatments that deliver transformative care.
- Continue to offer innovative treatments or novel therapies such as Tziel (teplizumab-mzwv) and Imdelltra (tarlatamab-dlle). These groundbreaking treatments allow us to provide state-of-the-art care, expanding treatment options for patients in need.
- Implemented and grew the Waste Billing Program, optimizing our ability to accurately account for and manage medication waste to ensure both cost-efficiency and regulatory compliance.

Overall, this year we made substantial progress on several key projects and initiatives focused on improving patient care, financial sustainability, and innovation within our organization. It reflects our unwavering commitment to excellence in patient care, innovation, and operational enhancements, all in support of our mission to provide the best possible outcomes for our patients.

INFORMATION TECHNOLOGY: DATA SCIENCE, ANALYTICS, AND AUTOMATION

- Improved workflow efficiency and reduced inventory costs through the implementation of two Omnicell Carousel systems.
- Improved carousel operational efficiency through the implementation of a suite of carousel focused reports.
- Enabled the dispensing of low- or no-cost medications to low-income, chronically ill patients by providing reporting requirements for the Dispensary of Hope, a charitable medication distributor.
- Increased drug savings through setting up crucial data infrastructure for “own use” drug pricing.
- Improved the impact of pharmacy resources and the health of patients in the Emergency Department at The Miriam Hospital through the implementation of an ED Pharmacist Dashboard.
- Trained and implemented an AI model to predict hyperglycemia and hypoglycemia.
- Helped to connect innovative ideas with resources and leadership through the development of infrastructure supporting the Dynamic Creators of Innovation process.
- Helped to discharge patients faster by developing a report to support an enhanced Prescription Drug Monitoring Program (PDMP) process.
- Improved IV therapy by developing and publishing a Hypersensitivity Power BI report.
- Improved anesthesia provider workflow and medication tracking through the implementation of Omnicell AMR.
- Reduced drug waste through the technical implementation of multi-dose insulin dispensing.
- Improved patient safety by upgrading Omnicell like-name notifications.
- Improved patient safety by reducing medication restocking errors and medication return errors by implementing Omnicell Safety Stock on all items.
- Improved medication safety by implementing Omnicell scan-at-issue functionality for high-risk and frequently misfiled medications.



Daniella Angervil, CPhT, replenishing stock to an Omnicell medication dispensing cabinet in a patient care unit.

PHARMACY CLINICAL INFORMATICS

Our informatics team of six pharmacists and one technician provides support, either directly or collaboratively, by managing preference lists, medication lists, and InBasket pools, facilitating First Databank (FDB) updates, order set updates or new builds, updating medication records, creating new medication records, maintaining the online formulary, troubleshooting issues from frontline staff, implementing drug shortage response strategies (alternative alerts—LMAs—order set updates, medication list modifications), managing billing error work queues, and much more.

This year, our team submitted more than 1,500 service requests and incidents to IS.

Inpatient

- Supported various workgroups; outcomes include:
 - Revising and improving administration instructions for nurse titratable infusions to operationalize optimized titration targets and parameters.
 - Developing and implementing the insulin infusion calculator.
 - Collaborating on the creation of a digoxin loading dose calculator.
- Collaborated on many order sets and order panels, including:
 - New order set build to support the transition to piperacillin/tazobactam extended infusion.
 - Updated the ED Sexual Assault order set to best reflect current practices, as well as adding Meds to Beds pathway for timely post-exposure prophylactic treatment.
 - Improved the safety and efficacy of the digoxin loading dose order panel.
- Edited IV and oncology preparation instructions, stability, and storage guidance to best align with changes in USP 797 and USP 800.
- Optimized compounding and repackaging records following initial implementation.
- Created the bulk product cart fill process at RIH.
- Streamlined IV orderable ERX records to reduce floor mixing for nurses.
- Assisted in a host of other initiatives, such as:
 - Developed new dispense logic at TMH to reduce unnecessary tablet splitting.
 - Helped in transition to shared insulin vials, including glargine, lispro, and regular insulin.
 - Supported in improving and expanding the waste billing process.
 - Built new LMAs to support our drug shortage process.
 - Aided carousel go-live by analyzing informatics-related carousel issues.

Outpatient

- Developed order panels for bariatric surgery and MME-based opioid discharge prescriptions, as well as created SmartSets (may include medications, labs, procedures, etc.) for new Center for Advanced Lung Care (CALC) department.
- Aided in response to Change Healthcare cybersecurity event by reconfiguring coverages, rules, and ultimately updating our switch vendor to Rx Linc. Identified and helped rebill thousands of claims related to downtime.
- Consolidated pharmacy queues in Willow Ambulatory system to streamline operations. Additionally, created a new documentation format to enable meaningful second verification queue in specialty space.
- Supported all build related to our Meds to Beds expansion into the emergency department at Newport Hospital.
- Continue to identify and improve processes, such as automatic printing of vaccine information sheets (VIS) and patient safety handouts for certain high-risk medications (e.g., methotrexate).
- Worked to develop department-specific outpatient prescription queues that assist with benefits investigation and proper prescription routing.

Pharmacy Analytics Leads to a Scorecard with Impact

It is not enough to simply prescribe a medication—not when the patient has been diagnosed with a high-risk condition. That is where pharmacy analytics comes in: throughout 2024, a team of Brown Health Pharmacy Services experts developed a series of ambulatory clinical scorecards that proved successful in achieving established guidelines. That means improved health for patients.

According to Laura McAuliffe, PharmD, BCACP, CDCES, manager, clinical pharmacy services, the first step was creating a strategic plan. “Pharmacy leaders discussed what they observed every day and what we should measure,” she says.

“The plan was to bring that information to our pharmacy analytics team, who would be instrumental in making the initiative come to life.”



Laura McAuliffe, PharmD,
BCACP, CDCES

They first addressed polypharmacy, where a patient taking multiple medications is at risk for falling. The patient might be on a medication that is no longer necessary. “This work is based at several of our primary care and specialty clinic offices,” McAuliffe notes. “Before we start a new service with patients, we review it completely with the providers, who are very collaborative and receptive to working with the pharmacists.”

The team proceeded to implement innovative methodologies, including predictive modeling for medication adherence and risk stratification for high-risk populations. “We need to know what is regular and irregular—if there are specific targets for patients on various medications,” explains Brianna Reid, resource coordinator. “When was the patient first evaluated? We place filters into the reporting system to monitor their lab results.”

It didn’t take long for the pharmacy team’s analysis to indicate a decreased use of medications associated with high fall risk, which translated into a lower incidence of fall-related injuries. From there, they targeted patients on anticoagulation drugs, heart failure medications, treatment for opioid use disorder and treatment for HIV—95 percent of whom now have undetectable viral loads thanks to successful adherence strategies, along with counseling interventions led by pharmacy staff.

“Our clinical scorecard has definitely worked,” says McAuliffe. “We’re able to see the numbers on paper and on the computer screen, which show the progress we’re making. Our next goal is to apply our pharmacy analytics to all our clinical areas. For example, we’ve turned our attention to weight management.”

The work won’t stop. “How can we make the process even better?” says Reid. “We can never be too good at being preventive for our patients.”

In the OR, a Commitment to Safer Administration of Anesthesia Medication

In most hospital settings, physicians write orders for drugs, which the pharmacy verifies so that a nurse can scan the drug, match it with the order and administer to the patient. But it's not that easy in an operating room, which is a fast-paced environment.

"There are often multiple, very important tasks occurring simultaneously, such as putting a breathing tube in someone while giving them a drug to raise their blood pressure," explains Alexander Cohen, MD, medical director, peri-operative and procedural services, at Rhode Island Hospital. "In the OR, drug errors can occur due to incorrect drugs being selected, drugs being given at the incorrect time or drugs being mislabeled. The cause of these errors is often multifactorial."

One study estimated that medication errors occur in at least 1 in 133 doses administered during anesthesia. This led the Institute for Safe Medication Practices to issue guidelines in 2022 presenting best practices—notably, the use of barcode scanning in OR and procedural settings to confirm medication selection and eliminating the use of handwritten labels by 2025. This technology is not generally available in ORs.

"We put together a comprehensive package that we brought to our risk management group at Brown Health and applied for a grant to cover the purchase of the scanning and labeling technology we needed, as well as support from Epic," Cohen explains. The team, led by Michelle Gorgone, MD, vice-chair for quality in the department of anesthesiology, included Kristopher Davignon, MD, anesthesiologist at The Miriam Hospital, and other pharmacy colleagues. They were committed to rolling out the new technology in rapid fashion.



Alexander Cohen, MD

“The grant allowed us to purchase about 100 small tabletop printers, which we use to print labels for every single drug we administer, and the installation of top-of-the-line, hands-free drug scanners in every OR across RIH, Miriam and Newport hospitals. Scanning drugs allows us to get a second check on the medications we administer; the goal is to minimize risk to our patients.”

After six months of using the new technology in ORs and peri-operative areas, anesthesiology staff have not observed any drug errors related to medication scanning. "It's going to take at least a year to evaluate the impact on our patients of these scanning techniques," notes Cohen.

A long list of individuals made the new anesthesiology workflow happen, including bioengineering colleagues and anesthesia technicians. "We've done a lot of collaborative things with the pharmacists that have improved patient care during the past few years," says Cohen.

CENTER FOR MEDICATION-USE POLICY, SAFETY, AND OUTCOMES

Medication-Use Policy and Safety

- Collaborated with anesthesia provider leadership to implement medication labeling and barcode scanning into anesthesia medication administration workflows.
- Performed a comprehensive failure modes and effects analysis (FMEA) for the insulin dispensing model change to a multi-use vial, using results to implement targeted strategies to mitigate potential patient safety risks and failure points of the new planned process.
- Established a multidisciplinary Barcode Medication Administration (BCMA) workgroup at Rhode Island Hospital tasked with improving medication scanning rates through identification and removal of barriers to compliance. Following review of medication scanning data and focused walkarounds in key areas, an increase in barcode scanning rates in the emergency department--in particular, scanning contrast--was measured.
- Submitted three medication errors and/or near-misses to the Institute for Safe Medication Practices (ISMP) that were published in their Medication Safety Alert distributed nationwide.
- Several policies were updated that helped to clearly define expectations and establish accountability for critical processes, including:
 - Led the revision of the system-wide policy for medication reconciliation, adding clarification to the expectations for the collection and reconciliation of medications across all care settings.
 - Updated controlled substance discrepancy reporting and documentation policy, tightening timelines for resolution and defining time ranges for the escalation path to nursing leadership. Collaborated with nursing leaders to develop a culture of accountability and monitoring of performance using Controlled Substance Diversion Monitoring Scorecards.
- Collaborated with clinicians, clinical pharmacists, and informatics teams to develop best practice guidelines, order sets, and order panels in the electronic health record (EHR) to drive appropriate prescribing of opioids. These included new approaches to use of non-opioid options, inclusion of patient opioid exposure (naïve or tolerant), and potential risk of use of opioids. For outpatient prescribing, opioid tapering protocols were implemented to reduce the number of opioids prescribed at discharge for appropriate patients.
- Coordinated several successful regulatory engagements and resulting action plans from a wide scope of survey activities, including:
 - Successful compliance audits of several medications with an FDA Risk Mitigation and Evaluation Strategy safety program.
 - Redesigned the ordering and documentation of titratable medications in the EHR to improve compliance with The Joint Commission (TJC) standards. Following these updates and an extensive educational campaign, achieved an increase in compliance from baseline to greater than 95 percent.
 - Action plan developed based on gap analysis of newly released ISMP Targeted Medication Safety Best Practices (TMSBP) for hospital pharmacy with a focus on safe use of tranexamic acid, prevention of errors during transitions of care, and prevention of errors with vaccines.

- Collaborated with pharmacy clinical services in their ongoing efforts to complete and present the results of medication use evaluation (MUE) and therapeutic class reviews to the Brown University Health Pharmacy and Therapeutics Committee. Five medication use evaluations were completed:
 - Results from the four-factor prothrombin complex concentrate (KCENTRA) MUE resulted in a standardized fixed dosing strategy for cardiothoracic surgery patients.
 - A cangrelor (Kengreal) MUE revealed that post-cardiac intervention doses were prescribed in patients unable to take oral therapy. This resulted in an EHR change directing providers to use the appropriate lower dosing scheme for bridge therapy.
 - Polatuzumab vedotin (Polivy) observation time MUE helped in developing a strategy to safely increase the infusion rate and facilitate patient flow through the Brown Health Cancer Institute.
 - An MUE on the use of long-acting injectable antipsychotics revealed opportunities to improve compliance to the restricted use criteria and guideline recommendations for use.
 - A literature review and internal MUE of patients receiving remdesivir (Veklury) revealed that patients with mild COVID-19 could either be treated with supportive care or nirmatrelvir/ritonavir (Paxlovid). In response, a treatment algorithm was developed by the antimicrobial stewardship team to guide the management of patients with mild or moderate severe disease based on the MUE results.
- Two therapeutic class reviews have led to an algorithm facilitating the cost-effective use of medications to manage opioid-induced constipation and improved clinical guidelines for the use of neuromuscular blocking agents. Two additional therapeutic class reviews identified a preferred dihydropyridine calcium channel blocker and sodium glucose co-transport 2 inhibitor. Corresponding therapeutic interchange protocols were developed allowing for continued streamlining of the formulary.
- A respiratory inhaler to nebulization therapeutic interchange was approved by P&T, which will result in improved time to therapy initiation, reduced waste with missing inhalers, and a calculated reduction in drug expense of approximately \$800,000.
- The team continued to support review and updates to drug therapy and therapeutic guidelines.

Medication Outcomes

Continued pharmacy glucose and antithrombotic stewardship program efforts have led to additional improvements in Vizient quality and accountability metrics for warfarin/INR and insulin/hypoglycemia.

- Warfarin/INR: Sustained improvements in rates and comparative cohort scores across all hospitals, with zero cases at Newport Hospital for six consecutive quarters.
- Insulin/hypoglycemia: Continued overall comparative low rates of hypoglycemia for all hospitals, with Rhode Island and The Miriam Hospital achieving top decile performance for the 2024 reporting periods.

Performed a pre-post analysis of the impact of changes that had been made to hyperkalemia order sets intended to reduce rates of hypoglycemia by changing standard dosing of insulin from ten units to five units IV, along with updates to the IV glucose and blood glucose monitoring protocol. The analysis revealed:

- Change to insulin dose of five units was just as effective in reducing serum potassium as a ten-unit dose (-0.65 vs -0.67, $p=0.4$)
- No statistically significant difference in rates of hypoglycemia between the five-unit vs. ten-unit dosing, although five-unit dosing trended toward reduced rates.
- For patients with hypoglycemia, the hypoglycemic episode occurred at a median of ~2 hours from insulin administration.

As a result, updated the hyperkalemia order sets to maintain the standard insulin dose of five units IV, but changed the IV glucose and blood glucose monitoring orders to optimize the protocol.

Provided collaborative statistical consultation for a wide scope of ongoing pharmacy-led research projects and worked to streamline the process for submission of research projects to the Institutional Review Board (IRB) to increase the efficiency of the research process.

Provided support for the development of machine learning models including hypoglycemia and vancomycin predictive models.

Business Continuity Planning

Business Continuity Planning is critical for healthcare organizations to provide safe care to their patients and community during disruptions in their normal service processes. Natural disasters such as floods or hurricanes and cyberattacks can adversely affect the provision of services. Cyberattacks in the form of ransomware targeting healthcare delivery organizations have doubled from 2016 to 2021*. The average duration of downtime from a ransomware attack averaged 24 days for the first quarter of 2022^. The pharmacy's Business Continuity Committee continues to review and enhance its ability to provide safe and consistent medication therapy.

The following are a few key highlights from the last year:

- Key pharmacy Business Continuity Committee members are also members of the reorganized Emergency Preparedness Committee, which has a subgroup dedicated to downtime processes across the disciplines.
- An unexpected software downtime incident occurred that provided a test of our current processes and resulted in an initial discussion session and continued review. Some of the items under review include:
 - Business continuity downtime computers and corresponding printer maintenance checking
 - Reassessment of the department's "first four hours" preparation to handle a downtime episode
 - Evaluation of current paper chart and filing system
 - Discussion with Information Services to optimize patient profile printing
 - Updating staff education plan

*Neprash, H.T., McGlave, C.C., Cross, D.A., Virnig, B.A., Puskarich, M.A., Huling, J.D., Rozenshtein, A.Z., & Nikpay, S.S. (2022). Trends in Ransomware Attacks on US Hospitals, Clinics, and Other Health Care Delivery Organizations, 2016-2021. *JAMA Health Forum*, 3(12), e224873. <https://doi.org/10.1001/jamahealthforum.2022.4873>

^Petrosyan, A. (2024). *U.S. average length of downtime after a ransomware attack 2022*. Statista. <https://www.statista.com/statistics/1275029/length-of-downtime-after-ransomware-attack-us/>

AMBULATORY CARE PHARMACY NETWORK

Overview

The Brown University Health Ambulatory Care Pharmacy Network (ACPN) provides wide-ranging integrated outpatient patient care services focused on care continuity. These primarily consist of:

- Four retail pharmacies integrated with LifeChart, the system's electronic medical record.
- A dual-accredited specialty pharmacy serving patients with diagnoses in more than 30 specialty disease states.
- The Medication Access Program's streamlined clinician support of numerous administrative tasks, which include prior authorizations, patient financial assistance, and maintenance medication refill approvals.
- Clinical pharmacist specialists performing top-of-licensure patient care under collaborative practice agreements.

Retail and Specialty Pharmacy Services

- Meds to Beds program in Hasbro Children's Emergency Department
 - Winner of 2023 Pharmacy Service Line Annual Innovation Challenge
 - Bedside prescription delivery service provided to patients and families treated in Hasbro ED
 - Patients leave with prescriptions in hand, improving access to medications and eliminating the need for visits to an external pharmacy after discharge, thereby closing the loop in patient care
 - Utilization of this service increased from 2 percent to 11.55 percent since implementation
 - More than 2,100 patients served and nearly 4,500 prescriptions filled
- Implementation of Meds to Beds Opt-Out in Newport Emergency Department
 - Brown University Health Pharmacy is the default pharmacy for ED discharge prescriptions during hours of operation
 - Prescriptions delivered to bedside in the ED or picked up at the pharmacy
 - Utilization of this service increased from 2 percent to more than 15 percent
 - More than 800 patients served and nearly 1,300 prescriptions filled
- Change Healthcare cyberattack
 - Nationwide outage of one of the largest healthcare information vendors
 - Business continuity navigating billing outage for more than a week with minimal disruption to patient care
 - Transition to new pharmacy switch vendor
- Partnership with State of Rhode Island Crime Victim Compensation Program to provide financial assistance for post-exposure prophylaxis for ED patients.
- Continued Brown University Health Pharmacy partnership and process improvements with Rhode Island Free Clinic. The program has served more than 470 patients and provided more than 1,700 prescriptions since inception.
- Recipient of 2024 Rhode Island Pharmacists Association Pharmacy Service Award for promoting Health Equity and the Profession of Pharmacy.

- Preferred pharmacy for beneficiaries of Brown Health's Employee Health Plan; covered lives transitioned to Brown University Health Specialty Pharmacy.
- More than 520,000 outpatient prescriptions dispensed, 16 percent retail prescription growth and 38 percent increase in specialty patient panel growth.
- Presentation on community medication disposal program at Vizient meeting.
- Administration of newly approved smallpox/monkeypox vaccine.
- Specialty Pharmacy achieved re-accreditation from the Accreditation Commission for Health Care (ACHC).
- Added 44 medications to the Specialty Drug Management Program, including enrollment in seven new REMS programs.
- Our specialty patients report a satisfaction rate of 99.6 percent with our program.
- Brown University Health Specialty Pharmacy patient management program routinely produces patient medication adherence rates >95 percent, ensuring our patients maximize the benefits of their therapy.

Centralized Pharmacy Services

- The Medication Access Program (MAP) and Pharmacy Technician Navigator teams continue to expand:
 - There are now 42 clinic locations receiving ACPN patient support services, including prior authorizations, financial assistance, and refill authorization support.
 - Initiated central support services to complete prior authorizations for Hasbro Children's (Gastroenterology, Pulmonology, Allergy, Rheumatology), Center of Primary Care (Adult Endocrinology), and Gateway Healthcare.
 - Completed service rollout to the Cardiovascular Institute.
- Enhanced pharmacy technician navigator services for our inflammatory diseases program and expanded to the Center for Advanced Lung Care.
- The Brown Health Medication Access Refill Program was launched to enhance our refill authorization service line and now includes ambulatory liaisons acting as agents of the provider to process refills.
- The Medication Access Program and Pharmacy Technician Navigator teams:
 - Provided services to more than 40,000 unique patients.
 - Performed ~21,000 benefit investigations.
 - Submitted ~12,000 prior authorization cases within one day with more than 90 percent approval rate.
 - Processed >132,000 refills within one day on average.
 - Provided financial assistance services for ~3,500 patients.
 - Connected 1,175 unique patients to Brown University Health Pharmacy, translating to 28,000 fills total.



Stephen Gadbois, CPhT, preparing an order for medication adherence packaging.

Ambulatory Clinical Services

- Streamlined structure and process of implementing and updating collaborative practice agreements.
- Implemented new collaborative practice agreements for the management of:
 - Asthma and Chronic Obstructive Pulmonary Disease
 - Interstitial Lung Disease
 - Pulmonary Vascular Disorders
- Established clinical pharmacy services in:
 - Behavioral health at Gateway Healthcare
 - Polypharmacy service in primary care
 - Pediatric asthma and pulmonary disorders at Hasbro Children's
 - Pediatric hematology/oncology at The Tomorrow Fund at Hasbro Children's
 - Pulmonary hypertension and interstitial lung disease at Rhode Island Hospital's new Center for Advanced Lung Care
 - » The Center for Advanced Lung Care is one of only a handful of centers in the United States, and the only center in Rhode Island and southeast New England, that offers advanced treatments for thromboembolic pulmonary hypertension (TEPH).
- Pharmacists now administer long-acting injectable medications (Sublocade and Brixadi).
- Developed outpatient verification queues, allowing both benefits investigation and therapy evaluations to occur prior to final pharmacy receipt.
- Restructured the primary care service line and introduced a clinical pharmacist for on-demand clinician requests and polypharmacy service.

- Brown Health Clinical Integration medication therapy management pharmacist team achieved the highest quality achievement rate for the 2023 Blue Cross Blue Shield of Rhode Island Patient Centered Pharmacy Program. Achieved at least a four-star rating in several primary care practices for the UnitedHealthcare Medicare quality measures.
- Implemented a diabetes self-management education class for The Miriam Hospital immunology clinic.
- Suite C and Endocrinology clinics in year two as recipients of a \$40,000 Pharmacy Quality Improvement Initiative grant through the Care Transformation Collaborative of Rhode Island for Improving Population Health/Reducing Low-Value Care in Primary Care through Ambulatory Blood Pressure Monitoring (ABPM) or Professional Use of Continuous Glucose Monitoring (proCGM).
- The Brown Health Anticoagulation Pharmacy Service (APS) supported approximately 180 providers. The APS team saw an increase in patients managed from 3,288 to 4,457 and performed more than 44,000 patient encounters.
- Partnered with URI College of Pharmacy to initiate the RxSynergy Project, leveraging respective expertise to deliver population health services to vulnerable populations in our state.
- The Ambulatory Care Pharmacy & Therapeutics Subcommittee approved nine additions to the formulary.



Audrey Whalen, PharmD, taking a patient's vitals during an office visit.

Brown Health Medical Group Primary Care

The Clinical Pharmacy Program is a key component of Brown Health Medical Group Primary Care's value-based care strategy. The program aims to enhance care quality, reduce costs, and improve the patient experience by addressing medication-related needs, ensuring safe and effective medication use, and supporting clinicians with pharmacotherapy expertise.

- Clinical Pharmacist Support
 - Collaborative disease management for conditions such as diabetes, COPD, hypertension, heart failure, asthma, hyperlipidemia, anticoagulation, and general medication therapy management
 - Deliver telephonic, in-person, and centralized care for all primary care patients (23 adult, family medicine, and pediatric practices)
 - ~22,000 unique patient interactions
- Population Health/Disease Management
 - Multidisciplinary care teams, including pharmacists, registered nurses, and patient engagement navigators caring for high-risk patients with COPD, diabetes, heart failure, and hypertension
 - ~10,000 unique patient interactions
- Pharmacy Ambulatory Liaison Support
 - Medication access (refill, prior authorization, medication cost) support provided to all Brown Health Medical Group Primary care practices
 - Implemented pharmacy technician refill authorization approval, aligning refill criteria and job descriptions with the Med Access Program.
 - More than 200,000 refill encounters and more than 3,000 prior authorizations submitted in 2024

Rapid Diagnostic Test Has Led to Improved Care For Patients with Gram-Negative Bacteremia

Gram-negative bacteremia, a relatively common blood infection, is being treated effectively throughout Brown University Health, thanks to use of a rapid-diagnostic test and intervention by the antimicrobial stewardship program. Although Accelerate Pheno is well-established at Brown Health, pharmacy staff decided to assess its impact.

“We have one or two patients with gram-negative bacteremia in the ICU at all times and up to a dozen patients throughout the rest of the hospital,” says Julian Ventres, PharmD, BCPS, a pharmacist at The Miriam Hospital. “These infections often result when an infection, such as a urinary tract infection, spreads to the blood, which is especially common in our older patients.”

Before Accelerate Pheno became available, organism identification and antimicrobial susceptibility results could take up to 72 hours to appear. “That’s a long time if you have started the patient on the wrong antibiotic,” notes Ventres. “With Accelerate Pheno, we know the results in less than a day.”

Ventres and colleagues conducted a study in 2024 that compared the use of Accelerate Pheno with the traditional blood test. The results were impressive: among 264 patients, the need for intravenous therapy was shortened by more than three days; the length of stay was shortened by about two days; readmission rates were markedly reduced; and substantially more patients transitioned to oral therapy.

“You can use a test, but it’s only useful if someone takes action as a result,” says Emerald O’Rourke, PharmD, clinical pharmacist specialist, infectious diseases and antimicrobial stewardship. That is where the antimicrobial stewardship program comes in. Established ten years ago at Rhode Island and The Miriam hospitals, it is led by Cheston Cunha, MD, and includes five pharmacists, including O’Rourke.



Julian Ventres, PharmD, BCPS

“Our daily stewardship activities are focused on responding to diagnostic results,” she explains. “Reports in the patient record alert us in real time when relevant lab results, such as Accelerate Pheno, become available.”

Collaboration is a key element. “We collaborate with our antimicrobial stewardship attending physician before reaching out to the patient’s primary care team,” says Ventres. “We typically recommend an antibiotic, dose and duration of therapy, and we offer our expertise and guidance, but the physician caring for the patient makes the call.”

Challenges remain. Expanding these positive results to other infectious diseases will require adoption of additional, new rapid-diagnostic tests, such as a new test for gram-positive bacteremia.

For now, pharmacists and physicians at Brown Health are impressed with Accelerate Pheno. “It has been a game-changer,” says Ventres.

PHARMACY BUSINESS OPERATIONS

Overview

The Pharmacy Business Operations Team is composed of a diverse set of individuals: pharmacists, technicians and finance professionals. They support all facets of the pharmacy service line under the auspices of our pharmacy supply chain, revenue-cycle integrity, 340B Program, and pharmacy finance teams. Collectively, they are responsible for budget preparation and monitoring, 340B Program integrity and compliance, pharmaceutical contracting, systemwide medication inventory management, and assistance with pharmacy revenue cycle, specifically related to patient assistance. Those broad categories greatly understate the volume and value of work produced by the pharmacy business operations teams on a daily basis.

This year continued to present the team with unprecedented challenges relative to the 340B Program. The constant assault by pharmaceutical manufacturers took millions of dollars away from the care of Brown University Health patients. Because of the diligence of the 340B team and collaboration with ambulatory and specialty pharmacy teams, and legal, compliance and government affairs partners, the team was able to retain some of our previous benefit.

Through contracting efforts, Pharmacy Business Operations was successful in supporting the pharmacy's strategic plan of contemporizing practices and technology—bringing much-needed efficiency and data transparency to the great work performed by the service line. The pharmacy revenue-cycle integrity team has provided millions of dollars of financial support to seriously ill patients who are on very expensive medications.

The pharmacy supply chain, which handles nearly a half-billion dollars in inventory per year, maximized the use of new technology to ensure contract parity, resulting in millions of dollars of savings for the system. All told, the Pharmacy Business Operations team serves a critical infrastructure role for its evolving and innovative best-in-class pharmaceutical care of patients at Brown Health.

Pharmacy Purchasing

- >\$360 million dollars of pharmaceutical products purchased across 100+ pharmacy wholesale accounts.
- Addressed >400 unique pharmaceutical product recalls.
- Handled >150,000 unique Drug Supply Chain Security Act (DSCSA) transactions to meet the highest standards in validation of pharmaceutical product security and integrity.
- Realized >\$1.3 million in pharmaceutical savings through partnership and initiative implementation with Vizient Northeast Purchasing Coalition (NPC).
- Leveraged contracting parity and pricing validation software and realized >\$1 million in expense avoidance.
- Maintained wholesale acquisition cost (WAC) expense percentage below six percent, thereby reducing wasteful expense.

Drug Shortages

Drug shortages continue to present a significant challenge to health system operations. Through partnership and collaboration across the system, the drug shortage pharmacist identified, tracked and mitigated the shortage impact to patients and clinicians. The most significant drug shortages emerged from manufacturer and 503b compounding pharmacy supply disruptions due to FDA violations and quality failures.

Some of the highest-impact shortages have required extensive planning and collaboration with providers, pharmacy clinical services, and pharmacy IV services such as Cardioplegia.

Summary of actions:

- Identified, monitored, triaged, and mitigated >200 unique drug shortages.
- Continued contracted partnerships with ABC Sure Supply, Vizient NES Supply Reserve program, and Medigi to provide redundancy when a supply of contracted products is not available.
- Contracted with a pharmacy wholesaler to provide access to short-dated items direct from manufacturers as a step to further mitigate the product not being available.

Pharmacy Revenue Cycle

- Pharmacy revenue cycle integrity team expanded with an addition of two more revenue integrity specialists.
- New initiatives include copay assistance and monitoring JW modifier transactions for repayment.
- Accessed >\$2.5 million in subsidized medication by enrolling our uninsured and underinsured patients in manufacturer-sponsored patient assistance programs.
- Helped obtain >\$150,000 in copay assistance for patients in outpatient clinics.
- Monitored four different charging work-queues and assist ancillary areas with billing issues, intervening on nearly \$1 million in medication cost, which otherwise would be denied.
- Validated repayment of high-dollar outpatient infusions, including >\$6 million of new JW modifier waste billing revenue.
- Collaborated with prior authorization team and infusion staff to ensure correct medications are authorized. Converted nearly \$125,000 in biosimilar medications to the authorized product prior to incurring denials.

340B Drug Pricing Program

The 340B Drug Pricing Program was created by Congress in 1992 to help providers serving low-income Medicare, Medicaid, and uninsured patients. Savings from the 340B Program support investment in programs across the region that serve a high proportion of Medicaid and other underserved patients.

FY23 Key 340B Impact Statistics

Uncompensated medical care	\$77M
Charity care and community benefits	\$216M
Rhode Island residents who live in poverty	10.8 percent
RIH's Disproportionate Share (DSH) adjustment	22.26 percent

340B Program Has an Impact Throughout Brown University Health

The 340B Drug Pricing Program has benefitted countless individuals since it was created by Congress more than 30 years ago. It requires that pharmaceutical manufacturers who participate in Medicaid or Medicare Part B sell outpatient medications at a discount to eligible safety-net providers. In Rhode Island, where 10.8 percent of residents live in poverty, Brown University Health pharmacy staff direct 340B funds to fill the gap in care.

In 2023, 340B allowed Rhode Island Hospital to provide \$293 million in community benefits: \$216 in charity care and other benefits and \$77 million in uncompensated medical care. This included free medication for management of opioid overdose; support for The Burn Center, Stroke Center, and oncology care at five locations; and comprehensive mental health and wellness care.

At The Miriam Hospital, three clinics benefit from 340B. The largest is the Ryan White Program, which provides care to individuals with HIV.



Joseph Garland, MD

“We follow 2,050 people living with HIV—80 percent of those in Rhode Island with the disease,” says Joseph Garland, MD, medical director, infectious disease/immunology center. “Our clinical outcomes are excellent: 91 percent of our patients have an undetectable viral load.”

340B funds are used for the Ryan White Program’s longstanding patient bill assistance program. “Many of our patients are uninsured or under-insured,” Garland explains. “When a survey revealed that many patients struggle to get to clinic, we began using the funds for a transportation program.”

The Miriam Hospital’s sexually-transmitted diseases (STD) and tuberculosis (TB) clinics also receive 340B support. “In addition to providing the necessary medications, each clinic has bill assistance and transportation programs, and 340B funds are directed toward facility and staffing costs. The three clinics are incredibly important public health measures, because we’re reducing the risk of transmission.”

In 2023, the Ryan White Program received \$5,384,255 in 340B savings, the STD clinic received \$1,071,182, and the TB clinic received \$21,081.

The collaboration among Brown Health physicians and pharmacists has grown steadily. “At Miriam Hospital, we now have three clinic-based pharmacists who are experts in infectious diseases,” Garland notes. “There is a Brown Health retail pharmacy on the first floor of our building, and I chat with the pharmacists multiple times a day. For example, they message me to say ‘Your patient is here; we need a refill on his prescription.’ It’s seamless, and it gives our patients confidence in the system.”

340B funding is, of course, essential. “Relative to treating infectious diseases, together we’re providing bold, high-quality health care and public service.”

Examples of how Brown Health uses savings to benefit the community include:

- Partnering with the RI Free Clinic Dispensary of Hope to provide free drugs to vulnerable patients without insurance, improving access to care, ensuring therapeutic benefit for controlling chronic conditions.
- Delivering comprehensive mental health and wellness care for adults, adolescents, and pediatric patients.
- Operating five oncology care locations throughout the state, allowing patients to receive care closer to home.
- Opening the Center for Advanced Lung Care, which provides cutting-edge surgical technology to those suffering from complex lung and heart-lung conditions.
- Offering the first of its kind treatment for bleeding disorders for a recently approved gene therapy drug.

Beginning in 2020, manufacturers began restricting 340B pricing at contract pharmacies, totaling 36 as of September 2024. We have responded by:

- Working with Hospital Association of Rhode Island to draft and present state legislation to regulate PBMs' discriminatory practices and protect contract pharmacies, which passed in the Senate.
- Meeting with Congressional staff to advocate for the program and provide boots-on-the-ground updates on the impact of these manufacturers' actions.
- Providing a 16-page request for information (RFI) response to the Congressional Gang of Six Senators and drafted SUSTAIN 340B Act to ensure our concerns and agreements are heard in any changes made to the program.
- Expanding 340B savings through waste charging.
- Implementing operational changes that align with language within the original statute upon which manufacturers focus their arguments.



Alexa Donovan, PharmD, counseling a patient at the Center for Primary Care.

New Initiative for Medication Waste Billing Proves Successful

In the world of IV medication, avoiding waste is an important goal, especially with high-cost compounded sterile medications. In 2017, the Centers for Medicare & Medicaid Services established a change in the coding system that allows providers to identify the dose administered to the patient, as well as separate waste charges. It is common for a patient to require 1.5 vials for a weight-based compounded medication. Who is responsible for the cost of the remaining half-vial?

That is where the JW modifier comes in. Brown Health Pharmacy Services staff began studying its use in order to report in a patient's chart the amount of a drug that was discarded. "Modifiers tell the billing system whether or not the medication vial was completely used," explains Shannon Baker, PharmD, BCSCP, pharmacy manager, compounding services, at Brown Health.

In 2023, the pharmacy leadership team identified \$980,000, over a 90-day period, in potential medication waste billing opportunities throughout Brown Health Cancer Institute.



Shannon Baker, PharmD, BCSCP, pharmacy manager

“The pharmacy was already using a vial-sharing process for compounded medications where two patients coming in on the same day, each needing 1.5 vials, could share the ‘middle vial’ during preparation and not waste any medication. In FY23, we started small—that is, applying the JW modifier to nurse-administered, pre-filled syringes where the dose wasn’t equal to the full syringe.”

That worked well, so the use of JW modifiers was expanded to compounded medications. “This required pharmacy staff to complete a manual documentation of waste that was placed in the patient's electronic chart, and we could then be reimbursed by the patient's health plan,” says Baker. “We started with a few drugs—for oncology and some rare diseases—to make sure our approach was working. We hired staff to take on the implementation and monitoring.”

Capturing revenue from waste billing is labor-intensive: medical insurance benefits vary, medications require specific dosing, drug costs frequently change, drug shortages are a fact of life today, and insufficient documentation can require time and effort.

From early in FY24, the results were promising. “We incorporated our program into the Epic medical record system and identified another 25 medications. Between October 2023 and June 2024, reimbursements increased by nearly 12 times.”

The impressive effort led to serious revenue, and the pharmacy staff isn't stopping. “For FY25, we identified another 25 medications, and our monthly revenue has continued to increase,” Baker notes.

EMPLOYEE ENGAGEMENT

Dynamic Creators of Innovation

During the past year, the Dynamic Creators of Innovation (DCOI), formerly known as Innovation Challenge, has undergone a number of enhancements. One major change was the inclusion of a Lean Process Improvement component that captures simple operational and safety improvements. Another was to make a more efficient tool using automation. Now managers receive alerts when an employee submits an idea, and employees receive an automated submission confirmation. Additionally, to benefit managers, the development of a dashboard to track and view snapshots of submissions over time within their respective area(s) is underway.

In parallel, a TMH-wide process improvement initiative was taking place, and the TMH inpatient pharmacy was one of a few departments that participated in a pilot program during the past year, which has seen great success. The DCOI program at TMH has been a catalyst for meaningful innovation and improvement. The team has tackled safety concerns such as optimizing syringe stock in code carts and refining ICU medication workflows. Process improvements, such as streamlined insulin dosing and updated storage protocols, have enhanced efficiency, while proactive equipment maintenance has resolved technical challenges critical to daily operations.

Supply chain adjustments and creative solutions, such as introducing ASCOM phones to improve pharmacist communication, highlight the program's impact. Above all, DCOI has empowered staff to take ownership of positive change, strengthening the culture of collaboration and excellence.

Employees of the Month

In October 2022, the Pharmacy Service Line Employee of the Month was implemented, which allowed pharmacy staff to nominate a peer they feel should be recognized for their service. Recognition of the winning nominee, along with remarks from the nominee's manager, have been incorporated into the monthly Pharmacy Town Hall meeting.

Month	Employee of the Month	Site
October 2023	Lauren Martinelli, CPhT, lead pharmacy technician	Newport Hospital
November 2023	Melissa Graves, CPhT, pharmacy technician navigator	Brown University Health Specialty Pharmacy
December 2023	Marc Roberts, CPhT, lead pharmacy technician Paul Shaughnessy, PharmD, clinical pharmacist, oncology and sterile compounding	Rhode Island Hospital
January 2024	Wing On Cheung, PharmD, clinical pharmacist, inpatient	The Miriam Hospital
February 2024	Jennifer Sawyer, CPhT, pharmacy technician specialist	Newport Hospital
March 2024	Lisa Coleman, CPhT, pharmacy purchasing specialist	Rhode Island Hospital
April 2024	Joshua Hayden, PharmD, BCPS, clinical pharmacist specialist, inpatient	The Miriam Hospital
May 2024	Adriano Conceicao, CPhT, 340B ACE, pharmacy 340B sr. specialist Marisol Etheridge, CPhT, pharmacy 340B specialist Tommy Franco, CPhT, pharmacy 340B sr. specialist Alyssa Hewson, CPhT, pharmacy 340B sr. specialist Ellyn Hutchinson, CPhT, pharmacy 340B sr. specialist Jennifer Janeiro-Massa, CPhT, pharmacy 340B sr. specialist	Rhode Island Hospital
June 2024	Toni-Ann Hawkins, CPhT, pharmacy technician supervisor	Rhode Island Hospital
July 2024	Christopher DeLucia, PharmD, clinical pharmacist, oncology and sterile compounding	Rhode Island Hospital
August 2024	Alexa Donovan, PharmD, BC-ADM, CDCES, CDOE, clinical pharmacist specialist, ambulatory	Rhode Island Hospital
September 2024	Kelsey Burke, PharmD, BCGP, clinical pharmacist, ambulatory	Brown University Health Specialty Pharmacy

Employee Well-being and Celebration Activities

The pharmacy service line continues to offer a variety of activities—both in-person and virtual—for the staff. Efforts during the past year support the following goals: to enhance the department's culture, provide team-building opportunities, expand the staff's contribution to innovation, improve work-life balance, and increase options for healthy choices.

The following options were provided during the past year:

- National Pharmacy Week is celebrated during two weeks every October. National Pharmacy Tech Day is celebrated on the third Tuesday of October. Activities included two separate therapy dog visits, pizza and dessert party, hot and cold breakfast in the manager's office for the overnight and early morning shifts, trivia night at a local restaurant, ice cream social, and freshly popped popcorn.
- Monthly calendar of events (except for the summer months)
 - Fun National Day celebrations such as Banana Bread Day, Clean Out Your Computer Day, and PopcDay
 - Hospital's Fun Fridays included participation in events such as wearing the colors of your favorite team or a festive holiday sweater
 - Weekly 15-minute sessions on Teams for exercising, yoga, or learning about the programs available through the hospital's sponsored Virgin Pulse platform
 - Reminders of educational and social events offered by Brown Health such as discounted tickets to PBruins, Healthcare Worker Appreciation Month at Mystic Aquarium, and financial planning sessions by Fidelity
- Miscellaneous activities
 - Coloring posters in the main pharmacy for everyone's participation
 - Grab and Go nourishment tables at periodic times throughout the year
 - Team participation in events such as the American Heart Association and Walk to End Alzheimer's
 - Thanksgiving Food Drive and Holiday Adopt-a-Family

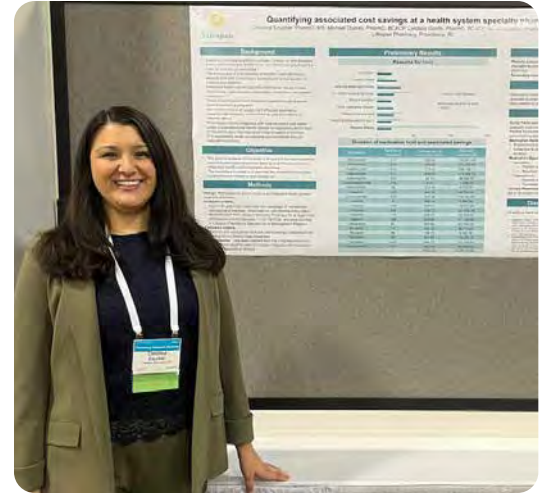


The Brown University Health Cancer Institute team at Rhode Island College for the 2024 Heart Walk.

ACADEMIC PROGRAMS

Brown Health Pharmacy Services participated in a number of educational programs during the 2023-2024 academic year, including lecturing to local college physician assistant programs and precepting introductory pharmacy practice experience (IPPE) and advanced pharmacy practice experience (APPE) students.

- Brown Health pharmacy services provided a total of 149 hours of lectures to physician assistant and nurse practitioner programs during the 2023-2024 academic year.
 - This included 69 lectures to Johnson & Wales University students and 22 lectures to Rhode Island College students.
- The RIH pharmacy precepted 43 APPE students over the course of 76 rotations. The number of APPE rotations offered increased 17 percent, from 65 rotations the previous academic year. RIH pharmacy also precepted eight IPPE students over eight rotations. Students starting as IPPE students in their second year of pharmacy school returned as APPE students and stayed on as PGY1 pharmacy residents.
 - In addition to precepting pharmacy students from local schools of pharmacy, Rhode Island Hospital also hosted two international students from the University of Rennes in France.
- This was the second year with an expanded RIH pharmacy longitudinal APPE program, with seven students for the calendar year. These students complete all their APPE rotations at Rhode Island Hospital and thus make a larger impact by completing longitudinal projects during their year here.
 - Four of the seven longitudinal APPE students from 2023-2024 went on to PGY1 residency programs, two accepting positions within Brown Health as clinical pharmacists, and one as a staff pharmacist at CVS Health.
 - Example projects that were completed include:
 - » Medication Use Evaluations of:
 - ◊ Aprepitant and Fosaprepitant for cannabinoid hyperemesis syndrome and cyclic vomiting syndrome
 - ◊ Four-factor prothrombin complex concentrate
 - » Assisting in creation of long-acting injectable antipsychotic replacement program
 - » Failure Mode Effects Analysis for multi-use insulin automated dispensing
 - APPE students were instrumental in the streamlining of the inpatient formulary through therapeutic class reviews of medications for overactive bladder and MRI contrast, formulary evaluations of brexpiprazole, and numerous therapeutic guidelines.
- The TMH pharmacy precepted a total number of 17 APPE students during 20 rotations. Twelve different preceptors spanning inpatient, retail, and ambulatory care pharmacy provided these experiences. Four of these preceptors also mentored six IPPE students during the academic year.
- The Pharmacy at Newport Hospital hosted two APPE students and five IPPE students during seven rotations.
- The Pharmacy at Bradley Hospital hosted four IPPE students during four rotations.
- Brown Health Medical Group Primary Care precepted ten students from both the University of RI and University of Connecticut over seven rotation blocks. Eleven different preceptors spanning Brown Health primary care offices and population health programs for diabetes, CHF, and COPD provided these experiences.



PGY1/2 HSPAL Pharmacy Resident, Christina Escobar, PharmD, presenting at Vizient Conference in Anaheim, CA, December 2023.

RESIDENCY PROGRAMS

Postgraduate Year 1 (PGY1) Pharmacy Residency Program at Rhode Island Hospital

Rhode Island Hospital had another successful recruitment season for the PGY1 pharmacy residency program. The program has continued to expand the inpatient and outpatient clinical experiences across the Brown University Health system. Residents gain expertise in clinical pharmacy practice and pharmacy operations and develop leadership skills throughout the year. Their learning experiences cover a wide variety of areas, including internal medicine, pediatrics, critical care, oncology, medication safety, formulary management, ambulatory care, pharmacy informatics, research, and healthcare analytics. Residents are involved in teaching activities with practitioners and pharmacy students at Brown Health and across Rhode Island. Residents complete the PGY1 program with the skills to benefit patient care at Brown Health and in their future careers.

Major accomplishments in the 2024 fiscal year:

- Expanded the clinical pharmacy on-call program driven by the PGY1 residents.
- All graduating residents continued on to a PGY2 program (seven residents) or successfully found a clinical pharmacy position at Rhode Island Hospital (one resident).
 - Three residents stayed at Brown Health for PGY2 positions

Postgraduate Year 1 (PGY1) Pharmacy Residency Program at The Miriam Hospital

The Miriam Hospital PGY1 Pharmacy Residency Program was established in 2021 and welcomed its first two residents in July 2022. The program offers comprehensive experiences in both inpatient and ambulatory care pharmacy practice sites. Residents gain expertise in clinical pharmacy practice, pharmacy operations, and develop leadership skills throughout the year. Core learning experiences include pharmacy administration, critical care, emergency medicine, cardiology, ambulatory infectious diseases, and internal medicine. Residents gain longitudinal experience in academia and preceptorship with the opportunity to obtain a teaching certificate, engage in research, and fulfill a service commitment and staffing requirements. Residents also have the opportunity to apply for early commitment to Brown Health PGY2 programs in ambulatory care, oncology, and critical care.

Major accomplishments during the 2024 fiscal year:

- Granted accreditation by the American Society of Health System Pharmacists for a duration of eight years.
- Appointment of Amy Brotherton, PharmD, AAHIVP, BCIDP, to the position of Residency Program Director.
- Appointment of Alex Fairhurst, PharmD, BCCCP, to the position of Residency Program Coordinator.
- Zach Sawyer, PharmD, TMH PGY1 Pharmacy Resident (2023-2024), graduated from the PGY-1 Program and will continue his training as the RIH PGY2 Oncology Resident for the 2024-2025 year.
- Serena Kang, PharmD, TMH PGY1 Pharmacy Resident (2023-2024), graduated from the PGY-1 Program and secured a position as an emergency medicine pharmacist at Sanford Health in Fargo, North Dakota.
- Former resident (2022-2023) Julian Ventres, PharmD, BCPS, achieved Pharmacotherapy Specialty Certification (BCPS).
- Former resident (2022-2023) Julian Ventres, PharmD, BCPS, submitted his manuscript from his residency research project, "Combination of a Rapid Diagnostic Assay and Antimicrobial Stewardship Intervention on Gram-Negative Bacteremia," which was accepted for publication in *Open Forum Infectious Diseases*.

- Zach Sawyer, PharmD, TMH PGY1 Pharmacy Resident, was selected as the recipient of the 2023-2024 Brown Health Pharmacy Rock Star Resident of the Year Award, an award that recognizes a pharmacy resident across all Brown Health Pharmacy Residency Programs who exemplifies the Brown Health pharmacy services mission statement, demonstrates exceptional problem skills, and consistently exceeds expectations during their residency year.
- Alex Fairhurst, PharmD, BCCCP, TMH Pharmacy Residency Program Coordinator, was selected as the recipient of the 2023-2024 Anchor Award, an award recognizing a pharmacy preceptor across all Brown Health Pharmacy Residency Programs who exemplifies the Brown Health pharmacy services mission statement and demonstrates outstanding leadership skills and professionalism.

Postgraduate Year 1 (PGY1) Pharmacy Residency Program at Brown Health Medical Group Primary Care

The Brown Health Medical Group Primary Care Brown Health/URI PGY-1 Pharmacy Residency Program offers a unique PGY-1 program focused on providing direct patient care in outpatient primary care practices. The resident works collaboratively as a member of the healthcare team to identify and alleviate medication-related problems, optimize patient outcomes, advance the workflows for medication use and safety in primary care, and evaluate the impact of medication management services. Clinical experiences are focused in the areas of adult internal medicine, diabetes, cardiology, pulmonology, anticoagulation, smoking cessation, and pain management. The resident is also involved in teaching activities at the University of Rhode Island as part of their teaching certificate program.

Major accomplishments during the 2024 fiscal year:

- Successfully implemented the flipped research model, which allowed the resident to present her research project results at ASHP's Midyear Clinical Meeting.
- Appointment of Jessica Sternberg, PharmD, BCACP, CDOE, CVDOE, to the position of Residency Program Director starting the 2024-2025 residency year.
- Appointment of Madeleine Ng, PharmD, BCGP, CDOE, CVDOE, to the position of Residency Program Coordinator starting the 2024-2025 residency year.
- Whitney King, PharmD, graduated and successfully secured a position as a clinical pharmacist at Lynn Community Health Center in Lynn, Massachusetts.

Postgraduate Year 1 (PGY1) Community-Based Pharmacy Residency Program

The Rhode Island Hospital/Brown University Health Specialty Pharmacy PGY1 Community-Based Pharmacy Residency Program was established in 2023. The program provides extensive experiences that foster the development of well-rounded leaders in specialty drug management and education with an emphasis on inflammatory conditions, oncology/hematology, pulmonary conditions, and transplant. These learning opportunities are coupled with longitudinal involvement in practice management, staffing responsibilities, population health management, medication therapy management (MTM), and research.

Major accomplishments during the 2024 fiscal year:

- David Young, PharmD, MBA, graduated and secured a position as a clinical pharmacist at Brown University Health Specialty Pharmacy.

Postgraduate Year 1/2 (PGY1/2) Health System Pharmacy Administration and Leadership (HSPAL) Pharmacy Residency Program

Rhode Island Hospital launched a PGY1/2 health system pharmacy administration and leadership pharmacy residency program in 2020 that offers comprehensive experience in clinical pharmacy, pharmacy operations, and pharmacy leadership throughout the Brown Health system. Learning experiences also include medication safety, pharmacy informatics, pharmacy finance and business operations, and specialty pharmacy. Residents are directed in skills critical to patient care, communication, and health system leadership.

Major accomplishments during the 2024 fiscal year:

- Christina Escobar, PharmD, graduated from the PGY1/2 HSPAL Program and secured a pharmacy operations supervisor position at University of Maryland Medical Center.
- Alyssa Soares, PharmD, graduated from the PGY1 pharmacy residency program at Rhode Island Hospital and will continue her training as the RIH PGY2 HSPAL Resident for the 2024-2025 year.

Postgraduate Year 2 (PGY2) Ambulatory Care Pharmacy Residency Program

Rhode Island Hospital in partnership with the University of Rhode Island College of Pharmacy developed a PGY2 ambulatory care pharmacy residency program that offers comprehensive experiences in ambulatory care pharmacy practice involving collaborative practice and comprehensive medication management in a variety of practice settings. These include adult primary care, dermatology, gastroenterology, immunology and infectious diseases, opioid use disorder, cardiology, renal transplantation, rheumatology, and specialty pharmacy. Residents are involved in teaching activities at the University of Rhode Island College of Pharmacy that specifically focus on skills critical to patient care communication and leadership.

Major accomplishments during the 2024 fiscal year:

- Former resident Elizabeth Salisbury, PharmD, and research mentor Alissa M. Margraf, PharmD, BCACP, were invited to speak at ASHP's "2024 Summer Virtual Networking Session" panel about each of their experiences as a past recipient of the ASHP Resident Research Grant (2020, 2023).
- Sabrina Silveira, PharmD, graduated from the PGY2 Ambulatory Care Program, was promoted to clinical pharmacist specialist, and is initiating outpatient electrophysiology pharmacy services at Brown Health.
- Jillian Cerullo, PharmD, graduated from the PGY2 Ambulatory Care Program, was promoted to clinical pharmacist specialist, and accepted a position at Brown Health in primary care (TMH Suite C).
- Katherine Owens, PharmD, graduated from the PGY2 Ambulatory Care Program and secured a position as a clinical pharmacist specialist in outpatient neurology at University of Maryland Medical System.
- Appointment of Alissa M. Margraf, PharmD, BCACP, to the position of Residency Program Director.

Postgraduate Year 2 (PGY2) Critical Care Pharmacy Residency Program

The PGY2 Critical Care Pharmacy Residency program welcomed its third resident this year. This program provides comprehensive training in critical care pharmacy practice, with residents rotating through all intensive care units (ICU) and the Emergency Department at Rhode Island Hospital. Additional responsibilities include emergency response, research, and leadership and teaching activities. The resident is directed in skills critical to patient care, communication, and leadership within a multidisciplinary health care team.

Major accomplishments during the 2024 fiscal year:

- The PGY2 Critical Care Pharmacy Residency Program received full accreditation from the American Society of Health System Pharmacists after undergoing the first survey this year.
- In FY23, the successful recruitment of a third resident, Jaidyn De Jesus, PharmD, occurred through the early commitment process.
- Christian Silva, PharmD, graduated and subsequently accepted a position at RIH as the Medical Intensive Care Unit clinical pharmacist specialist.
- Vanamrung (Viva) Isaragumpot, PharmD, was appointed to the position of residency program coordinator.
- Annaliese Clancy, PharmD, BCPS, BCCP, was appointed to the position of residency program director.

Postgraduate Year 2 (PGY2) Oncology Pharmacy Residency Program

The PGY2 Oncology Pharmacy Residency Program at Rhode Island Hospital, in affiliation with the University of Rhode Island College of Pharmacy, launched in July 2011 and trains one pharmacy resident per year. Learning experiences include adult and pediatric oncology clinical services in acute and ambulatory care settings, investigational drug services, research, and leadership activities.

Upon graduation, residents are prepared to function independently as hematology/oncology clinical pharmacy specialists and are considered essential members of a multidisciplinary team caring for patients with cancer. Furthermore, graduates from the program are prepared for roles as adjunct faculty for pharmacy students on rotation and in classroom learning experiences at colleges of pharmacy.

Major accomplishments during the 2024 fiscal year:

- Appointment of the 2023-24 PGY2 Oncology Pharmacy resident, Jenna Wu, PharmD, to Clinical Pharmacist Specialist - Inpatient Solid Malignancies, and preceptor for the oncology residency program.
- Jenna Wu, PharmD, and her program director, Justin Huynh, PharmD, BCOP, received the Hematology/Oncology Pharmacy Association (HOPA) travel grant to the HOPA Annual Conference.
- Zach Sawyer, PharmD, former PGY1 Pharmacy Resident at TMH, was successful in his early commitment to the PGY2 Oncology Pharmacy Residency Program.
- Rhode Island Hospital's long-awaited Bone Marrow Transplant Program is now fully operational and is integrated into the residency program's learning experiences.

2024 Preceptor Awards

Award	Recipient
Preceptor of the Year	James Beaulieu, PharmD
Preceptor Commitment to the Profession Award	Alexander Fairhurst, PharmD, BCCCP
Rock Star Resident of the Year	Zach Sawyer, PharmD
Resident Commitment to the Profession Award	Christian Silva, PharmD



Preceptor of the Year James Beaulieu, PharmD, with System Director of Inpatient Pharmacy, Bryan McCarthy Jr., PharmD.



Alexander Fairhurst, PharmD, recipient of the of the Preceptor Commitment to the Profession Award.



Christian Silva, PharmD, recipient of the Preceptor Commitment to the Profession Award.



Rock Star Resident of the Year, Zach Sawyer, PharmD.

RESEARCH

Overview

Pharmacy practice research in an academic health system encompasses a wide range of objectives and goals aimed at improving the quality of patient care, advancing the pharmacy profession, and contributing to the body of knowledge in healthcare. Key goals include:

- **Optimizing Medication Therapy:** Improve the safety and effectiveness of medication therapy by conducting research on drug interactions, dosing regimens, and therapeutic outcomes. This includes identifying strategies to minimize medication errors and adverse drug events.
- **Clinical Outcomes:** Evaluate the impact of pharmacist-led interventions and services on patient clinical outcomes, such as disease management, symptom control, and overall health-related quality of life.
- **Health Economics:** Analyze the economic implications of pharmaceutical interventions and healthcare services provided by pharmacists. Assess the cost-effectiveness and cost-benefit of various pharmacy practices.
- **Patient Safety:** Study strategies to enhance medication safety, including error reporting systems, medication reconciliation processes, and the use of technology to prevent medication errors.
- **Quality Improvement:** Engage in research projects that assess and enhance the quality of pharmacy services and patient care within the academic health system. Implement continuous quality improvement initiatives based on research findings.

These goals collectively aim to advance the pharmacy profession, improve patient care, and contribute to the overall goals of Brown University Health in research, education, and patient care. Brown Health provides a unique environment for conducting this research due to integration of clinical practice, education, and research activities.

Peer-Reviewed Scientific Publications

Pharmacy members published 14 peer-reviewed scientific manuscripts between October 1, 2023 and September 30, 2024.

1. **Belur**, et al. (2024). Palliative Care in the Cardiovascular Intensive Care Unit: A Systematic Review of Current Literature. *Cardiovascular Revascularization Medicine*.
<https://doi.org/10.1016/j.carrev.2024.03.024>
2. **Brotherton, A.L.**, Coroniti, A.M., Ayuninjam, D.K., Sanchez, M.C., Benitez, G., & Garland, J.M. (2024). Pharmacist-Driven Rapid Initiation of Antiretroviral Therapy Decreases Time to Viral Suppression in People with HIV. *Open Forum Infectious Diseases*, 11(5), ofae237.
<https://doi.org/10.1093/ofid/ofae237>
3. Desai, N., Ravindra, N., Hall, B., Alshaykh, H.A., **Lemke, L.**, Eken, E., Cicali, E.J., Wiisanen, K., Cavallari, L.H., & Nguyen, K.A. (2024). Assessing User Perspectives on Clinical Pharmacogenomics Consultation Documentation: A User-Centered Evaluation. *Frontiers in Pharmacology*, 15.
<https://doi.org/10.3389/fphar.2024.1377132>
4. **Greene, R.** served as site Principal Investigator for Rhode Island Hospital for: Bolesta, S., Perreault, M., Gelinis, C., Smith, K., Blair, J., Mochany, K., Wenner, N., & Burry, L. (2023). 964: International Study of Opioid and Sedative Use in Patients with ARDS or COVID-19. *Critical Care Medicine*, 52(1), S454–S454.
<https://doi.org/10.1097/01.ccm.0001002020.37277.cb>
5. Hayward, A., Huang, L., **Nagy, J.**, & Moretti, K. (2024). Pushing for IV Push Medications: Cost-Effectiveness Model of Switching from IV Piggyback to IV Push for Frequently Used Emergency Department Medications. *Rhode Island Medical Journal* (2023), 107(2), 44–47.
<https://pubmed.ncbi.nlm.nih.gov/38285753/>
6. Hundert, S., **McLlarky, J.**, Dunn, A., & Markle, W. (2024). Fixed-Dose Phenobarbital Versus As-Needed Benzodiazepines for the Management of Alcohol Withdrawal in Acute Care General Internal Medicine. *Southern Medical Journal*, 117 (1). 25-30.
<https://doi.org/10.14423/smj.0000000000001640>
7. Kim, M., **Arabi, J.**, McCoy, C., D'Souza, A., Chhabra, S., Abid, M.B., Thapa, B., & Dhakal, B. (2024). Safety of Dapsone for Pneumocystis jirovecii Pneumonia Prophylaxis in Patients with Multiple Myeloma. *Clinical Lymphoma, Myeloma & Leukemia*.
<https://doi.org/10.1016/j.clml.2024.06.010>
8. **Liau, J.C.**, **Brunault R.**, Quesenberry M., Bakow B. (2024). Split- and Reduced-Dose Imatinib in Chronic Myeloid Leukemia: Case Report. *Journal of Hematology Oncology Pharmacy*.14(3):121-123
<https://jhoponline.com/issue-archive/2024-issues/june-2024-vol-14-no-3/19672>
9. **Payne, M.L.**, Young, S., Heard, J., Bernardy, S., Duby, J.J., Fine, J., Wilson, M., & Louie, E. (2024). Effect of Dexmedetomidine on Fluid Resuscitation in Burn-Injured Patients. *Journal of Burn Care & Research*, 45(5), 1257-1263.
<https://doi.org/10.1093/jbcr/irae038>
10. Savarino, J.R., **Mokszycki, R.**, Tubbs, R., & Wightman, R.S. (2024) Refractory Hypoglycemia Due to Sulfonylurea Contamination of Illicit Opioid Medications. *Rhode Island Medical Journal* (2013), 107(5), 11-13
<https://pubmed.ncbi.nlm.nih.gov/38687261/>
11. **Silva, C.**, **Nagy, J.** (2023). 595: Outcomes of Platelet Infusion for the Reversal of Antiplatelet Medications in Traumatic Brain Injury. *Critical Care Medicine*, 52(1), S271–S271.
<https://doi.org/10.1097/01.ccm.0001000556.98945.38>
12. **Ventres, J.**, Ting, M.H., **Parente, D.M.**, Rogers, R., Norris, A.M., Benitez, G., Shehadeh, F., Bobenchik, A M., Mylonakis, E., Chapin, K.C., & Cunha, C.B. (2024). Combination of a Rapid Diagnostic Assay and Antimicrobial Stewardship Intervention on Gram-negative Bacteremia. *Open Forum Infectious Diseases*, 11(9).
<https://doi.org/10.1093/ofid/ofae477>

13. **Walsh, K.L., & Warriar, S.S.** (2024). The Medical Student Guide to Pharmacy: Piloting an Interactive Textbook on Basic Pharmacology Principles and Clinical Correlations. *Journal of Medical Education and Curricular Development*, 11.
<https://doi.org/10.1177/23821205231225589>
14. **Walsh, K.L., Yadav, A., Cradeur, M., Huang, H., Lee, D., Owusu-Dapaah, H., Ji, C., Kendall, M.C., & Asher, S.** (2023). Impact of a Preclinical Medical Student Anesthesiology Elective on the Attitudes and Perceptions of Medical Students Regarding Anesthesiology. *Advances in Medical Education and Practice*, 14, 1347-1355.
<https://doi.org/10.2147/AMEP.S427974>

Presentations, Lectures, and Panel Discussions

Pharmacy members completed 13 PowerPoint and poster presentations, lectures, and panel discussions between October 1, 2023 and September 30, 2024.

1. **Cotoia, N., Simpanen, C.** (2024, December 8). All About That CO₂: Review of Acid-Base Disorders. [presentation]. ASHP Midyear Clinical Meeting. New Orleans, LA.
2. **Garde, L.** (2024, June 8-12). Ideal Learner Track to Prevent Preceptor Burnout [pearl]. ASHP Pharmacy Futures. Portland, OR.
3. **Lemke, L.K.** (2023, November 11-14). Survey of Prescribers' Interest In and Understanding of Pharmacogenomics [poster]. ACCP Annual Meeting, Dallas, TX.
4. **Margraf, A., Salisbury E.** (2024, July 25). Summer Virtual Networking Session for Residents and Preceptors [panel discussion]. ASHP Foundation.
5. **McNicoll, L., McKaig, D., Chatellier, K., Kashmanian, A., Singh, M., McCarthy, J., Monteiro, F.** (2024, May 9-11). Beers' list alerts help reduce antipsychotic and benzodiazepine prescribing in hospitalized older adults [poster]. 2024 Virtual Annual Scientific Meeting of the American Geriatric Society.
6. **O'Neill E.T., Benitez, G., Parente, D.M., Lee, M., Cunha, C.B., O'Rourke, E.** (2024, April 27-30). Oral Doxycycline for Bacterial Cystitis: An Underutilized Tool for Antimicrobial Stewardship Programs [poster]. European Society of Clinical Microbiology and Infectious Diseases Global 2024, Barcelona, Spain.
7. **Payne, M.** (2024, January 23). Effect of Dexmedetomidine on Fluid Resuscitation in Burn-Injured Patients [Platform presentation]. Critical Care Congress, Phoenix, AZ.
8. **Roberts, M., Caetano, N.** (2024, June 4) House of Delegates Review for 2024 [lecture] RISHP Dinner ACPE-CE (1 hour)
9. **Roberts, M., Oto, B; and Posa, P.** (2024, January 21) ICU Liberation Evidence Updates [lecture] Society of Critical Care Medicine 2024 Congress
10. **Salerno, V.** (2023, December 2). Don't Rush to Flush! - Establishing a Community Medication Disposal Program [Educational Session]. Vizient Pharmacy Network Meeting. Anaheim, CA.
11. **Salisbury, E., McAuliffe, L., Collins, C., Zullo, A., Margraf, A.** (2024, June 11). Impact of Pharmacist-Mediated Refill Authorization Program on Proton Pump Inhibitor (PPI) Deprescribing Success Rates [poster]. ASHP Pharmacy Futures Meeting; Portland, OR.
12. **Ventres J., Ting, M.H., Parente, D.M., Rogers, R., Norris, A.M., Benitez, G., Shehadeh, F., Bobenchik, A.M., Mylonakis, E., Chapin, K.C., O'Neill, E.T., Lee, M., O'Rourke, E., Cunha, C.B.** (2024, April 27-30). Assessment of a Rapid Diagnostic Assay and Antimicrobial Stewardship Intervention on Treatment of Gram-Negative Bacteremia [poster]. European Society of Clinical Microbiology and Infectious Diseases Global 2024, Barcelona, Spain.
13. **Young, D., Connolly, E., Wynes, M., & Margraf, A.** (2024, June 5). Determining the Appropriate Duration of Small Molecule JAK Inhibitor as a Bridge Therapy with Vedolizumab in Treatment for Refractory Pediatric Inflammatory Bowel Disease [Webinar]. ASHP Specialty Pharmacy Resident Research Gems Webinar.

STRATEGIC PLAN

A newly created strategic plan performance scorecard was created and implemented. Quarterly performance report outs are conducted by goal leader(s) to assess progress toward the department’s long-term goals. By reviewing key performance indicators (KPIs), goal leaders are able to identify the need for course corrections, adjustments to strategies, and informed decision-making to stay on track with the overall strategic plan throughout the year. This allows for early detection of potential roadblocks or areas needing improvement so necessary adjustments can be made promptly.

The strategic plan continues to serve as a way to prioritize efforts and effectively allocate resources for the upcoming year to achieve the goals of the pharmacy department and the organization.

Pharmacy Services Strategic Plan FY 2023-2025
Goal 1: Enhance Patient Care and Access
Goal 2: Provide Disease Prevention, Management, and Wellness Programs and Services
Goal 3: Ensure System Integration
Goal 4: Enhance Financial Strength
Goal 5: Enhance Staff Recruitment, Retention, Development, and Engagement
Goal 6: Improve the Effectiveness of the Service Line Through Expanded Impact Measurement
Goal 7: Advance the National Reputation of the Department and Knowledge-Sharing

Focus areas for next year

- Continue carousel automation implementation.
- Establish a home infusion service, including a home infusion pharmacy.
- Open a centralized retail pharmacy to process home delivery and adherence packaging services.
- Open a centralized pharmacy supply chain warehouse.

ACHIEVEMENTS

Awards

Brown University Health Pharmacy at Rhode Island Hospital

Rhode Island Pharmacists Association (RIPA) Pharmacy Service Award

Brown University Health Specialty Pharmacy

Joseph Honig, PharmD, clinical pharmacist specialist, ambulatory

David Young, PharmD, MBA, clinical pharmacist, ambulatory

Rhode Island Pharmacists Association (RIPA) Service Award

Pharmacy Clinical Services

Kristel Chatellier, PharmD, clinical pharmacist specialist, inpatient

Alexander Kashmanian, PharmD, BCPS, BCIDP, clinical pharmacist specialist, inpatient

Donald McKaig, RPh, director, medication safety, quality, and pharmacy information technology

Presidential Poster Award in the Quality Measurement & Quality Improvement Category

Aisha Ashraf, PharmD, BC-ADM, clinical pharmacist specialist, ambulatory

CARE Recognition: Colleague Who Values Differences

James Beaulieu, PharmD, department coordinator, pharmacy services, formulary management

The Ocean Award Preceptor of the Year

Nicole Costabile, CPhT, lead pharmacy technician

Rhode Island Pharmacists Association (RIPA) Pharmacy Technician Service Award

Alexa Donovan, PharmD, BC-ADM, CDCES, CDOE, clinical pharmacist specialist, ambulatory

Rhode Island Certified Diabetes Outpatient Educators, CDOE Pharmacist of the Year

Alexis Duncan, PharmD, clinical pharmacist specialist, inpatient

Excellence in Triple Board Training Award

Katherine Duprey, PharmD, BCACP, CDOE, CVDOE, senior clinical pharmacist specialist, ambulatory

Rhode Island Pharmacists Association (RIPA) 2024 Guido L. Pettinicchio Pharmacist of the Year Award

Rachel Fortin, PharmD, BCPS, medication quality and safety specialist

2023 IPPE Preceptor of the Year - University of Rhode Island

Lyndsey Wiggin, PharmD, BCACP, CDOE, manager, specialty pharmacy clinical services

Rhode Island Pharmacists Association (RIPA) Service Award for Pharmacists

Justin Huynh, PharmD, BCOP, clinical pharmacist specialist, inpatient

Rhode Island Society of Health-System Pharmacists - Health System Pharmacist of the Year

Alexandra Medeiros, CPhT, drug diversion prevention specialist

RISHP Pharmacy Technician of the Year

Appointments

Diane Ayuninjam, PharmD, MPH, BCPS, AAHIVP, clinical pharmacist specialist, ambulatory
Assistant Professor of Medicine, The Warren Alpert Medical School of Brown University

Justin Huynh, PharmD, BCOP, clinical pharmacist specialist, inpatient
Adjunct Clinical Associate Professor, University of Rhode Island College of Pharmacy

Martha Roberts, PharmD, BCCCP, department coordinator, pharmacy services, medication use policy
Adjunct Clinical Associate Professor, University of Rhode Island College of Pharmacy
Chair, Section Advisory Group (SAG) for Emerging Sciences, American Society of Health-System Pharmacists (ASHP)
Committee Member, Council on Therapeutics, American Society of Health-System Pharmacists (ASHP)
Rhode Island Delegate – House of Delegates, American Society of Health-System Pharmacists (ASHP)
Secretary, Board of Directors, Rhode Island Society of Health-System Pharmacists (RISHP)

CERTIFICATIONS AND ADVANCED DEGREES

Aisha Ashraf, PharmD, BC-ADM, clinical pharmacist specialist, ambulatory
Board Certified—Advanced Diabetes Management (BC-ADM)

Emma Camara, PharmD, BCPS, clinical pharmacist, inpatient
Board Certified Pharmacotherapy Specialist (BCPS)

Rebecca Costa, PharmD, clinical pharmacist, ambulatory
American Society of Health-System Pharmacists (ASHP) Anticoagulation Certificate

Alexa Donovan, PharmD, BC-ADM, CDCES, CDOE, clinical pharmacist specialist, ambulatory
Board Certified—Advanced Diabetes Management (BC-ADM)

Christopher Gemming, CPhT-Adv, CSPT, pharmacy technician supervisor
Advanced Certified Pharmacy Technician (CPhT-Adv)
Certified Compounded Sterile Preparation Technician (CSPT)

Britt Harrington, PharmD, clinical pharmacist specialist, inpatient
American Society of Health-System Pharmacists (ASHP) Investigational Drug Services Professional Certificate

Claudia Harris, PharmD, clinical pharmacist, inpatient
American Society of Health-System Pharmacists (ASHP) Basics in Cardiology Pharmacy Certificate

Patrick Lee, PharmD, BCPPS, clinical pharmacist specialist, inpatient
Board Certified Pediatric Pharmacotherapy Specialist (BCPPS)

Lauren Lemke, PharmD, BCPS, clinical pharmacist specialist, ambulatory
Mental Health First Aid (MHFA) Certificate

Courtney Murray, CPhT-Adv, CSPT, in-D, investigational drug services specialist
CCRPS – Advanced Clinical Trial Assistant Certification
American Society of Health-System Pharmacists (ASHP) Research Skills Certificate

Michelle Payne, PharmD, BCCCP, clinical pharmacist specialist, inpatient
Board Certified Critical Care Pharmacist (BCCCP)

Brenna Reilly-Evans, PharmD, BCACP, clinical pharmacist specialist, ambulatory
Board Certified Ambulatory Care Pharmacist

Jacqueline Ward, CPhT-Adv, pharmacy technician supervisor
Advanced Certified Pharmacy Technician (CPhT-Adv)
Pharmacy Technician Certification Board (PTCB) Regulatory Compliance Certification

BROWN UNIVERSITY HEALTH PHARMACY SERVICES LEADERSHIP TEAM



**Shannon Baker, PharmD,
BCSCP**
pharmacy manager, oncology and
sterile compounding



**Krystal Bevilacqua, PharmD,
CDCES, CDOE, CVDOE**
diabetes program manager



Deepa Blomstedt, PharmD
pharmacy manager, medication
access program



**Nelson Caetano, PharmD,
MBA, DPLA**
director, inpatient pharmacy
operations, The Miriam Hospital



Bethany Carroll, RPh
manager, retail pharmacy,
at The Miriam Hospital



**Michelle Corrado, PharmD,
MHA**
system director, pharmacy
business operations



Eric D'Agostino, RPh
manager, retail pharmacy,
at Newport Hospital



Chelsea Dolloff, CPhT
pharmacy manager, 340B program



**Spencer Donovan, PharmD,
MHA**
manager, inpatient pharmacy
operations, Rhode Island Hospital



**Katherine Duprey, PharmD,
BCACP, CDOE, CVDOE**
sr. clinical pharmacist specialist,
SDPMP



**Michael Duprey, PharmD,
BCACP**
manager, specialty pharmacy



**Elyse Gagne, PharmD,
BCACP, CDOE, CVDOE**
clinical pharmacy manager



**Sean Gilman, PharmD,
BCCCP**
manager, inpatient pharmacy
operations, The Miriam Hospital



Chris Guillemette, MBA
pharmacy business manager



**Caitlin Kennedy, PharmD,
MHA**
director, population health
management, Brown Health
Medical Group Primary Care



Scott Lancellotta, RPh, CDOE
manager, retail pharmacy
at Corliss St.



Wang Lee-Chhum, PharmD
pharmacy manager, supply chain



**Laura McAuliffe, PharmD,
BCACP, CDCES**
manager, clinical pharmacy
services



**Bryan McCarthy, Jr., PharmD,
MS, MJ, FASHP**
system director, inpatient
pharmacy



Donald McKaig, RPh
director, medication safety,
quality, and pharmacy
information technology



Karen Nolan, RPh
director, inpatient pharmacy
operations, Rhode Island Hospital



Louis Palmisciano
manager, outcomes and impact



Paul Parchesky, MS, RPh
director, inpatient pharmacy
operations, Newport Hospital



Michael Poirier, PharmD, MHL
system director, pharmacy
ambulatory care services



Vincent Salerno, PharmD
director, retail pharmacy services



Raymond Spinella, RPh
manager, retail pharmacy at
Rhode Island Hospital



Kellie Sullivan, MBA
manager, pharmacy project
management service



**Shawn Whitehead, PharmD,
BCCCP**
manager, inpatient clinical
pharmacy



**Lyndsey Wiggin, PharmD,
BCACP, CDOE**
manager, specialty pharmacy
clinical services



**Ian Willoughby, PharmD, MS,
BCPS**
director, specialty pharmacy
services

2024-2025 RESIDENCY CLASS

Residency Program	Resident(s)	About
PGY1 Pharmacy Residency Program at Rhode Island Hospital	Amanda Blais, PharmD	Graduate of the University of Rhode Island
	Peyton Calvao, PharmD	Graduate of Western New England University
	Abbigayle Fielder, PharmD	Graduate of the University of Rhode Island
	Jo-Anne Henry, PharmD	Graduate of the University of Rhode Island
	Abigail Horan, PharmD	Graduate of the University of Rhode Island
	Ngan Nguyen, PharmD	Graduate of the University of Houston
	Catherine Smith, PharmD	Graduate of the University of Pittsburg
	Mary Zhuang, PharmD	Graduate of the University of Pittsburg
PGY1 Pharmacy Residency Program at The Miriam Hospital	Elizabeth DelVecchio, PharmD	Graduate of the University of Rhode Island
	Lauren Fortier, PharmD	Graduate of the University of Rhode Island
PGY1 Pharmacy Residency Program at Brown Health Medical Group Primary Care	Lydia Maskell, PharmD	Graduate of the University of Rhode Island
PGY1 Community-Based Pharmacy Residency Program	Morgan Felitte, PharmD	Graduate of the University of Rhode Island
PGY2 Health System Pharmacy Administration and Leadership (HSPAL) Pharmacy Residency Program	Alyssa Soares, PharmD	Graduate of Massachusetts College of Pharmacy and Health Sciences Completed PGY1 Pharmacy Residency at Rhode Island Hospital
PGY2 Ambulatory Care Pharmacy Residency Program	Katherine Houlihan, PharmD	Graduate of the University of Rhode Island Completed PGY1 Pharmacy Residency at the URI/Walgreens Community-Based Residency Program
	Kaitlin Leduc, PharmD	Graduate of the University of Rhode Island Completed PGY1 Pharmacy Residency at Rhode Island Hospital
	Jack Mountain, PharmD	Graduate of the University of Connecticut Completed PGY1 Pharmacy Residency at Cambridge Health Alliance
PGY2 Critical Care Pharmacy Residency Program	Jaidyn De Jesus, PharmD	Graduate of the University of Rhode Island Completed PGY1 Pharmacy Residency at Rhode Island Hospital
PGY2 Oncology Pharmacy Residency Program	Zach Sawyer, PharmD	Graduate of Albany College of Pharmacy and Health Sciences Completed PGY1 Pharmacy Residency at The Miriam Hospital

CLINICAL COORDINATORS

Inpatient

Name	Title
Jim Beaulieu, PharmD	Department coordinator, pharmacy services, formulary management
Jessica Bellavance, PharmD	Clinical pharmacist coordinator, informatics
John Comley, PharmD	Pharmacy coordinator, oncology and sterile compounding
Allison Dias, PharmD, BCSCP	Pharmacy coordinator, revenue cycle
James Higginbottom, RPh	Clinical pharmacist, controlled substances coordinator
Brett Lareau, PharmD	Pharmacy coordinator, oncology and sterile compounding
Annmarie Niewiecki, RPh	Clinical pharmacist, controlled substances coordinator
Martha Roberts, PharmD, BCCCP	Department coordinator, pharmacy services, medication use policy
Darlene Tat, PharmD, MPH	Department coordinator, pharmacy services, outcomes

Ambulatory & Specialty

Name	Title
Amy Brotherton, PharmD, AAHIVP, BCIDP	Clinical pharmacist coordinator, infectious diseases
Robert Brunault, PharmD, BCOP	Clinical pharmacist coordinator, oncology
Robin Carey, PharmD, BCACP, CDOE, CVDOE	Clinical pharmacist coordinator, cardiology
Russell Dunn, PharmD, BCACP	Clinical pharmacist coordinator, informatics
Kathryn McCoart, PharmD, MBA	Clinical pharmacist, specialty pharmacy compliance coordinator
Megan Scalia, PharmD	Clinical pharmacy coordinator, ambulatory
Allison Zuern, PharmD, BCPS, BCACP, CDCES	Clinical pharmacist coordinator, ambulatory

CLINICAL PHARMACY SPECIALISTS

Inpatient

Name	Specialty	Site
Shriji Amin, PharmD	Adult Emergency Medicine	RIH
Jessica Arabi, PharmD, BCCCP	Critical Care - Trauma/Burn	RIH
Kasey Audus, PharmD, BCPS	Internal Medicine	TMH
Olivia Bleier, PharmD	Pediatrics - Emergency Medicine	RIH
Kristel Chatellier, PharmD	Internal Medicine	TMH
Annaliese Clancy, PharmD, BCPS, BCCP	Critical Care - Cardiac surgery	RIH
Giulia Conley, PharmD, BCPS	Internal Medicine	RIH
Mike Consaga, PharmD	Internal Medicine	RIH
Joseph Corbino, PharmD	Infectious Diseases	RIH
Delaney (Corcoran) Brooks, PharmD, BCCP	Antithrombotic Stewardship	RIH
Nicholas Cotoia, PharmD	Critical Care - Medical	TMH
Justin Culshaw, PharmD	Critical Care - Cardiac	RIH
Alexis Duncan, PharmD	Pediatrics	RIH
Alex Fairhurst, PharmD, BCCCP	Critical Care - Medical	TMH
Rachel Fortin, PharmD, BCPS	Medication Safety	RIH
Katelyn Gargano, PharmD, CSP	Informatics	RIH
Halley Gibson, PharmD, BCPS, BCCP	Antithrombotic Stewardship	RIH
Linda Guddie, RPh	Blood Glucose Stewardship	RIH
Britt Harrington, PharmD	Investigational Drug Services	TMH
Joshua Hayden, PharmD, BCPS	Adult Emergency Medicine	TMH
Justin Huynh, PharmD, BCOP	Oncology	RIH
Vanamrung Isaragumpot, PharmD	Critical Care - Medical	RIH
Sandra Juckett, PharmD	Informatics	RIH
Alexander Kashmanian, PharmD, BCPS, BCIDP	Internal Medicine	RIH
Mary Lattanzi, PharmD	Investigational Drug Services	RIH

Inpatient *(continued)*

Name	Specialty	Site
Christine Lawson, PharmD	Adult Emergency Medicine	RIH
Michelle Lee, PharmD	Infectious Diseases	RIH
Patrick Lee, PharmD, BCPPS	Pediatrics - Emergency Medicine	RIH
Jillian McLlarky, PharmD, BCPS	Internal Medicine	TMH
Timothy McLlarky, PharmD, BCPS	Cardiology	TMH
Krista Mecadon, PharmD, BCTXP	Solid Organ Transplant	RIH
Robert Mokszycki, PharmD	Adult Emergency Medicine	RIH
Shane Moran, PharmD	Investigational Drug Services	RIH
Michael Nadeau, PharmD	Investigational Drug Services	RIH
Jessica Nagy, PharmD, BCPS	Adult Emergency Medicine	RIH
Kathleen Neves, PharmD	Medication Safety	RIH
Marissa Norberto, PharmD	Informatics	RIH
Emerald O'Rourke, PharmD	Antimicrobial Stewardship	NPH
Michael Pasqualicchio, PharmD, BCPS, BCCCP	Critical Care - Surgical	RIH
Michelle Payne, PharmD, BCCCP	Critical Care - Neurology	RIH
Christian Silva, PharmD	Critical Care - Medical	RIH
Caroline Sweeney, PharmD	Psychiatry	RIH
Sandra Taber, RPh, BCOP	Investigational Drug Services	RIH
Phu Thai, PharmD	Informatics	RIH
Barbara Wang, PharmD	Transitions of Care	RIH
Steve Willis, PharmD, BCPPS	Pediatrics - Critical Care	RIH
Jenna Wu, PharmD	Oncology	RIH
Morgan Wynes, PharmD, MBA, BCPS, BCPPS	Pediatrics - Hematology/Oncology	RIH

CLINICAL PHARMACY SPECIALISTS (continued)

Ambulatory & Specialty

Name	Specialty	Site
Meav Ainley, PharmD, CDOE, CVDOE	Medication for Opioid Use Disorder (MOUD)	RIH
Aisha Ashraf, PharmD, BC-ADM	Primary Care	RIH
Diane Ayuninjam, PharmD, MPH, BCPS, AAHIVP	Infectious Diseases	TMH
Jillian Cerullo, PharmD	Ambulatory Care	RIH
Erin Connolly, PharmD, BCACP	Inflammatory Diseases	BHRx
Alexa Donovan, PharmD, BC-ADM, CDCES, CDOE	Endocrinology - Diabetes	RIH
Michelle Gauvin, PharmD, BCACP, BCGP, CDCES	Primary Care	RIH
Rebecca Greene, PharmD, BCCCP	Pulmonary Hypertension	BHRx
Katherine Harte, PharmD, BCACP	Neurology	BHRx
Christine Holahan, RPh, CSP	Inflammatory Diseases	BHRx
Joseph Honig, PharmD	Pediatrics - Pulmonary	BHRx
Madison Huntley, PharmD	Pediatrics - Neurology	BHRx
Hannah Kisla, PharmD, BCOP	Oncology	RIH
Kristina LaPerriere, PharmD, CDOE, CVDOE	Cardiology	RIH
Lauren Lemke, PharmD, BCPS	Pharmacogenomics	RIH
Justin Liauw, PharmD, BCOP	Oncology	BHRx
Alissa M. Margraf, PharmD, BCACP	Inflammatory Diseases	BHRx
Diana Maynard, PharmD	Ambulatory Care	RIH
Elizabeth Medeiros, PharmD	Pulmonary - Cystic Fibrosis	BHRx
Saman Mirzaei, PharmD	Pediatrics - Hematology/Oncology	BHRx
Safiya Naidjate, PharmD, BCACP, CDCES	Primary Care	RIH
Thu-Trang Nguyen Raheb, PharmD	Inflammatory Diseases	BHRx
Amy Phelps, RPh	Inflammatory Diseases	BHRx
Brenna Reilly-Evans, PharmD, BCACP	Infectious Diseases	TMH
Elizabeth Salisbury, PharmD	Psychiatry	RIH
Cristina Santos, PharmD	Primary Care	RIH
Sabrina Silveira, PharmD	Cardiology	RIH
Eridania Teixeira, PharmD	Viral Hepatitis	RIH
Laura Varnum, PharmD, BCACP	Inflammatory Diseases	BHRx
Kenneth Wagg, RPh	Hemophilia/Sickle Cell	BHRx
Audrey Whalen, PharmD	Endocrinology - Diabetes	RIH



Members of the pharmacy team at Brown University Health Pharmacy Newport Hospital.

A YEAR OF INNOVATION

