



Duke University Hospital

# Department of Pharmacy Annual Report

Fiscal Year 2019



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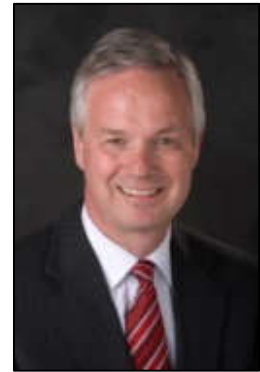
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**Duke Pharmacy**  
Duke University Hospital

**Message from the Chief Pharmacy Officer**

**Paul Bush**



It is my pleasure to present the 2019 Annual Report for the Department of Pharmacy. This annual report highlights the exceptional work that the Duke pharmacists and staff accomplish on a daily basis and the successful initiatives that transform the quality of pharmaceutical care for our patients. These exceptional accomplishments are detailed in the report under the respective service areas and program categories.

It has been a busy and productive year. I will highlight several accomplishments but suggest that you review the entire report to fully understand all that has been accomplished.

Programs were expanded and enhanced to keep pace with Duke University Hospital's growth. The Antimicrobial Stewardship program expanded inpatient coverage of pediatric patients after a successful pilot. Population Health Pharmacy Services expanded home visit coverage through the addition of a pharmacy technician. The Investigational Chemotherapy Service expanded to support compounding of investigational drugs and the expanding oncology programs at Duke Raleigh Hospital. Oncology trained clinical pharmacists joined the staff to expand coverage in both inpatient and ambulatory settings. A successful pilot demonstrated that medication prescribed for patient's at high-risk for re-admission is better managed by clinical pharmacists resulting in addition of dedicated staff. Clinical pharmacists were added to support the patients served by the Outpatient Antibiotic Treatment Clinic and the Anticoagulation (VAD) Clinic. Center for Medication Policy staff collaborated with Duke primary care clinics to implement preemptive pharmacogenomics testing in select patient populations.

The department embraced the Duke Quality System *Commit to Zero* harm for our patient's their loved ones and each other through implementation of both Tier 1 and Tier 2 huddles. Pharmacy staff and leaders have been recognized for their ability to solve problems to root using the A3 PDCA methodology. Duke's 340B program was reviewed by federal government HRSA auditors resulting in a report of full compliance and the Duke residency programs had a very successful reaccreditation survey resulting in accreditation through 2027.

A devastating fire incident challenged the Duke Outpatient Pharmacy. Through creative and determined teamwork, services were continued during reconstruction. The production capability of the department continued to grow. The Duke Compounding Pharmacy and Procurement divisions produced more than 160,000 units of sterile and non-sterile preparations each month. The Inpatient Operations Sterile Preparation team more than 6,700 doses utilizing robotic technology.

The 2019 Milton W. Skolaut Leadership Award recognizing the leadership and professional contributions of a past resident of the Duke University Hospital Pharmacy Residency Program was awarded to Richard H. Drew, PharmD, MS, FCCP, FIDP.

All this work directly supports our mission and vision for pharmacy services at Duke University Hospital. These accomplishments would not be possible without the commitment and personal dedication of the Duke University Hospital pharmacy leadership team and staff members.

I would like to thank each and every member of the staff for their commitment to the profession and dedication to the care of Duke Health patients.

Sincerely,

A handwritten signature in black ink that reads "Paul W. Bush". The signature is written in a cursive, flowing style.

Paul W. Bush, PharmD, MBA, BCPS, FASHP  
Chief Pharmacy Officer

## II. Departmental Overview

### Mission

We deliver exceptional pharmacy services for a healthier tomorrow

### Vision

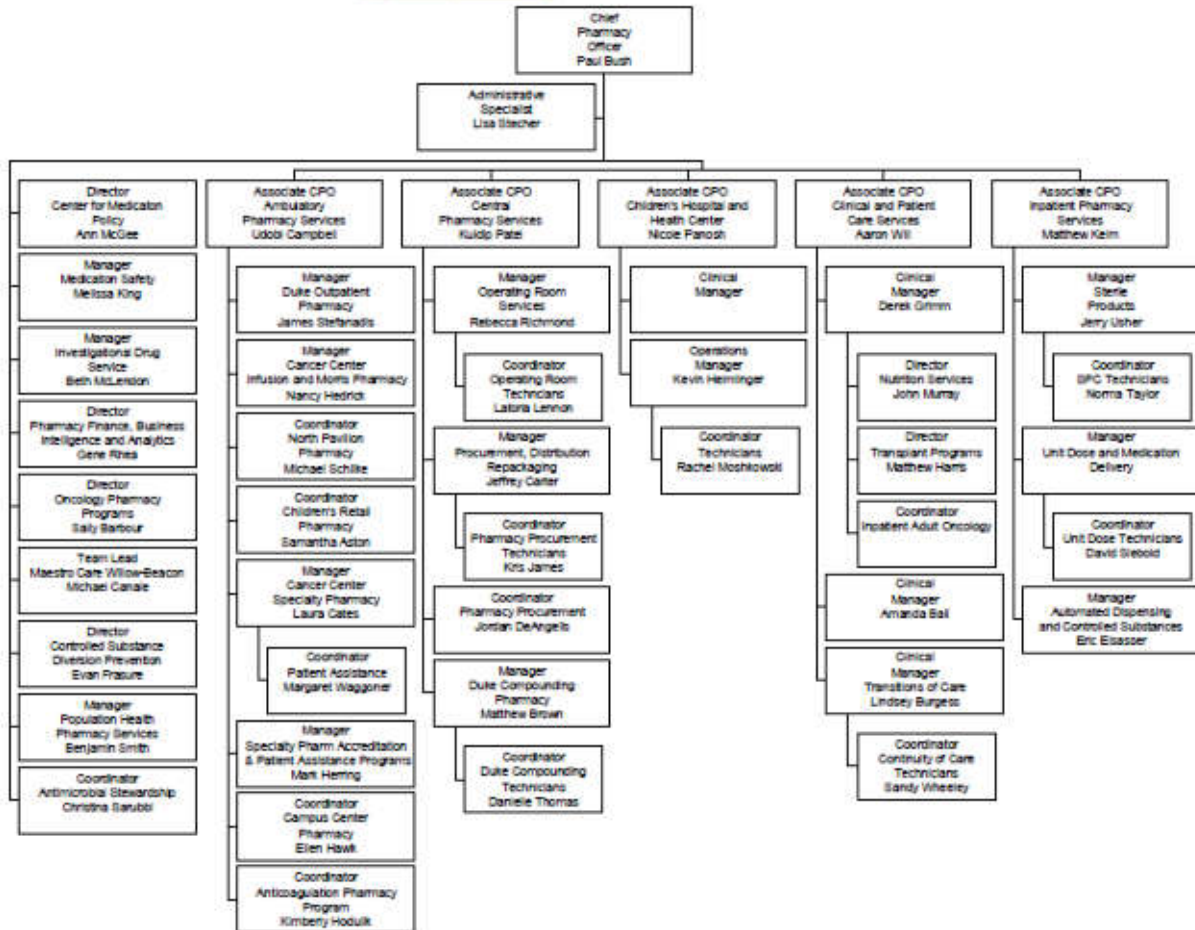
To be a distinguished global leader in pharmacy care

### Goals

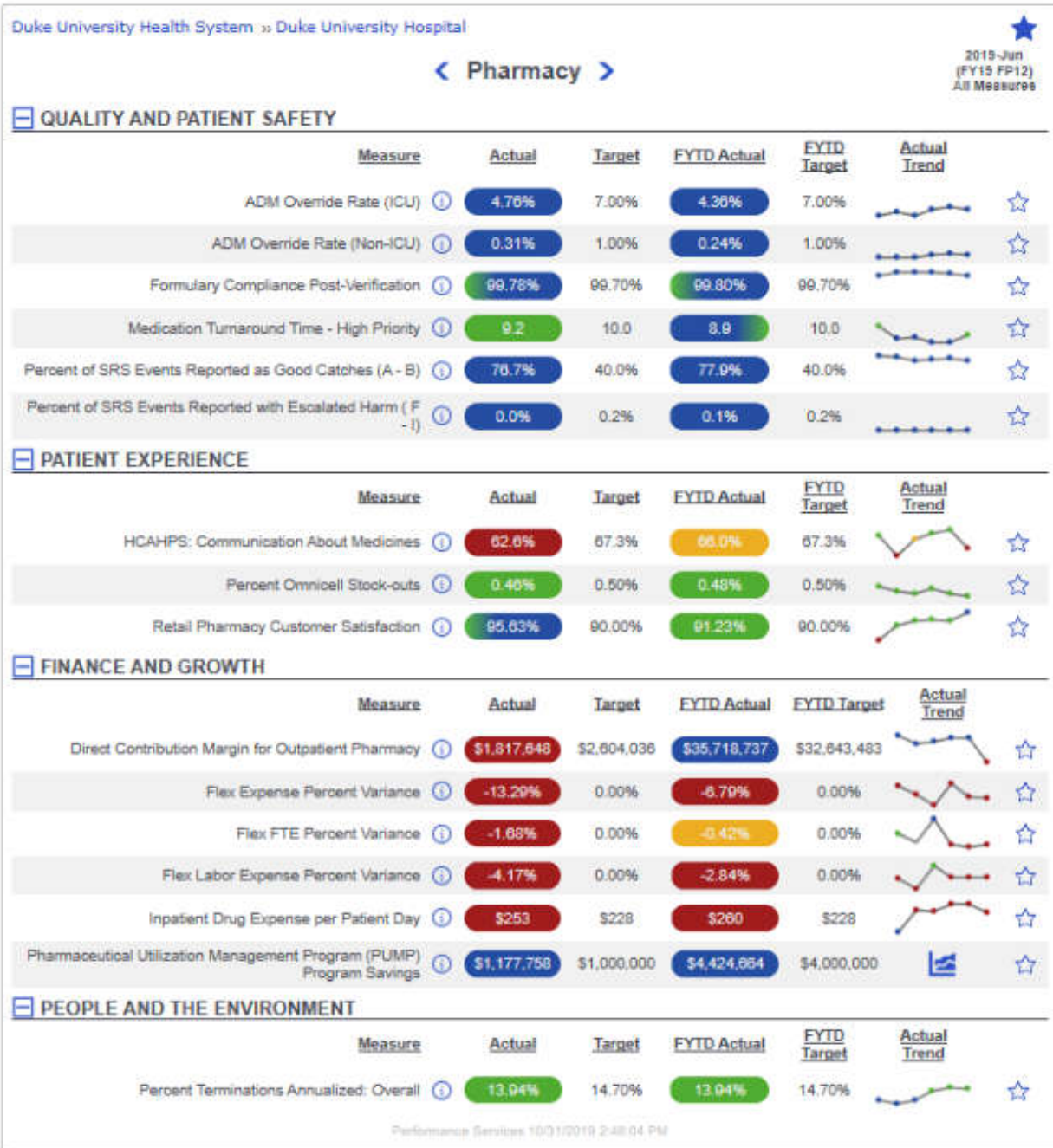
- Improve patient outcomes and provide the highest standards of pharmacy care
- Foster a collaborative approach to medication safety among all disciplines
- Provide an exceptional work environment that will establish Duke as the pharmacy employer of choice
- Integrate new technological developments that improve efficiency and safety
- Promote research to improve patient outcomes and the efficiency of care
- Expand and promote excellence in pharmacy education



### III. Organizational Chart



## IV. Balanced Scorecard



## **V. Overview of Pharmacy Services: Scope and Accomplishments**

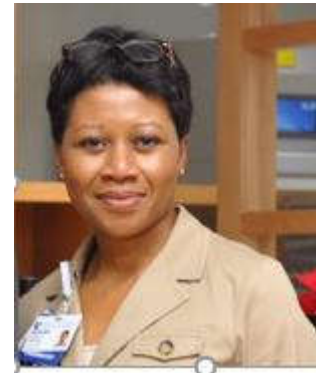
Duke University Hospital (DUH) is an academic learning center and serves as the flagship for Duke University Health System. A tertiary and quaternary care hospital, the 979-bed DUH is consistently rated as one of the top hospitals in the United States. It offers comprehensive diagnostic and therapeutic facilities, including: a regional Level 1 emergency trauma center; multiple surgical platforms including a major surgery suite containing 50 operating rooms; an endo-surgery center; an ambulatory surgery center with nine operating rooms; an eye center with five operating rooms; and extensive diagnostic and interventional radiology facilities. DUH also functions as a research facility where innovations in medicine are consistently achieved and implemented. It is a teaching hospital for students of medicine, pharmacy, nursing, and the allied health sciences. The Department of Pharmacy provides a broad range of advanced pharmacy services. The mission of the Department of Pharmacy is to deliver exceptional pharmacy services for a healthier tomorrow.

To achieve this mission, the department employs multiple pharmacy practice models:

- Team and location-based pharmacotherapy specialist pharmacists deployed to the inpatient setting and outpatient clinics
- Specialized pharmacy services operating from discrete areas (e.g. Ambulatory pharmacies, Infusion pharmacies, Operating Room pharmacies, Investigational Drug Services, Production and Packaging and Sterile Products);
- Targeted patient care services (e.g. pain management, nutrition support, anticoagulation, transplantation, pharmacokinetic dosing consults, population health management); and
- Program-based services (e.g., performance improvement, medication safety, medication stewardship, antimicrobial stewardship, drug information and support to medical staff committees including the DUHS Pharmacy and Medication Management, DUHS Medication Safety Committee, DUH Pharmacy and Therapeutics Committee, DUH Medication Safety Committee, DUH Patient Safety Committee, Duke Medicine Institutional Review Committees, DUH Infection Control Committee and DUH Ethics Committee).

### **Services Provided to Duke Patients**

- Admission
  - Assure a complete and accurate medication history and reconcile prescribed medication
  - Develop, document and initiate the medication-related components of the patient care plan
- Services
  - Review and approve medication orders before the first dose is administered
  - Review patient-specific medication profiles on a daily basis
  - Monitor the patient's response to medication therapy and adjust medication doses based on response or pharmacokinetic characteristics of the medication
  - Participate in the nutritional support of patients working collaboratively with team members to initiate parenteral nutrition and adjust formulations based on patient response
  - Monitor critically important medication serum concentrations and other clinically important laboratory analyses
  - Participate in patient care rounds
  - Participate in rapid response and resuscitation
- Discharge (Transition)
  - Educate patients about their medication, and establish processes to ensure complete and accurate prescriptions and medication-related continuity of care for discharged patients
  - Provide medications for home use



### Overview of services

The Ambulatory Pharmacy Division is comprised of different areas of services with talented team members committed to the care of patients at Duke, and support for each other. The following listing represents clinical and operational areas of work or service groups in the division and the primary patient population and care units served.

- Children's Health Center Retail Pharmacy
  - Pediatric/adult patients, Duke employees, discharged patients
- Duke Cancer Center Specialty Retail Pharmacy
  - Oncology, Transplant, Hepatology, MS, Adult and Pediatric Rheumatology, Osteoporosis, HIV, CF, Hyperlipidemia, IBD
- Patient Assistance Programs
  - Patient prescription enrollment for Duke Clinics
  - Infusion drug assistance for oncology and non-oncology patients
- Duke Cancer Center Infusion Pharmacy
  - Oncology Treatment Center, Oncology Clinics, Radiation Oncology
- Duke Outpatient Retail Pharmacy
  - Duke Clinic patients, Duke employees
- Morris Pharmacy
  - Duke Specialty Infusion Center, Duke Hospital Based Clinics
- North Pavilion Pharmacy
  - Ambulatory Surgery Center, Adult Bone Marrow Transplant
- Duke Campus Center Pharmacy
  - Duke Student Health & Wellness
- Clinic-Based Pharmacist Clinician Practices
  - Oncology Clinics
    - Breast, Brain Tumor, Hematology-Oncology, GU, Sarcoma, BMT, Thoracic, GI
    - Oncology Treatment Center
  - Duke Outpatient Clinic
  - Duke Family Medicine Clinic
  - Anticoagulation Service (Hematology & VAD)
  - Infectious Disease Clinic
  - Abdominal Transplant Clinic
  - Lung Transplant Clinic
  - Neurology Clinic
  - Hepatology Clinic
  - Rheumatology Clinics
  - Endocrine Clinic
  - Inflammatory Bowel Disease

### Mission

Our mission is aligned with the mission of the Department of Pharmacy – “*We deliver exceptional pharmacy services for a healthier tomorrow.*”



## **Goals**

- To foster an environment for responsible medication management and use
- To develop a business model for self-sustaining clinical pharmacy services within Hospital Based Clinics
- To ensure continuity of care as patients transition from inpatient to outpatient and to strengthen the collaboration between inpatient and outpatient pharmacy services
- To optimize the use of technology and automation to support pharmacy services
- To support pharmacy practice and clinical research, residency training and student clerkships
- To serve as the preferred retail pharmacy for all Duke University Hospital patients and employees
- To positively contribute to the direct contribution margin for Duke University Hospital
- To ensure that pharmacists will be available, visible, and serve as the primary resource for medication related issues across Duke University Hospital outpatient areas

## **Locations and Hours of Operation**

- CHC Retail Pharmacy: 8:30 AM - 8:00 PM M-F; 8:30 AM - 4:30 PM Sat & Sun
- Duke Cancer Center Specialty Pharmacy: 8:30 AM - 6:00 PM M-F; 24/7 On-Call
- Duke Cancer Center Infusion Pharmacy: 7:30 AM - 6:30 PM M-F
- Duke Outpatient Retail Pharmacy (OPD): 8:30 AM - 6:00 PM M-F
- Morris Pharmacy: 7:30 AM - 4:00 PM M-F
- North Pavilion Pharmacy: 6:30 AM - 5:00 PM M-F; 7:00 AM – 11:00 AM Sat & Sun
- Duke Campus Center Pharmacy 9:00 AM – 5:30 PM M, W, Th, F; 9:00 AM – 7 PM Tuesdays

## **Major Accomplishments**

- Approximately \$37 million in direct contribution margin (DCM) generated by the retail platform
- Creative continuation of services following a devastating fire incident in the Duke Outpatient Pharmacy
- Opening of a newly renovated Duke Outpatient Pharmacy in December 2018
- Significant construction projects in the CHC Retail Pharmacy to enhance ergonomics of the work environment
- Established a discharge medication delivery service for pediatric transplant patients through the CHC Retail Pharmacy
- Active involvement in the design of the new North Pavilion infusion and retail pharmacies
- Transition of the BEAM oncology treatment to the outpatient platform supported by the North Pavilion Pharmacy and ABMT Clinic
- Significant construction projects in preparation for USP 800 – Cancer Center Infusion Pharmacy and Morris Pharmacy
- Clinical pharmacist service expansion to the Outpatient Antibiotic Treatment (OPAT) Clinic
- Achieved significant care coordination with the process for managing transplant patients with NAT+ HepC
- Approximately 3800 pharmacy-led in-person and telephone patient encounters completed at the Duke Outpatient Clinic

*Reopened outpatient pharmacy with updated design*

- Successful accreditation/re-accreditation of the oncology and ambulatory residency programs
- Additional clinical pharmacist service expansion in Oncology and Anticoagulation (VAD) services
- Obtained approval for enhanced services in oncology with patient assistance program technicians
- Significant construction projects in the Cancer Center Retail Pharmacy to enhance shipping capabilities, and expand the call center
- Creation of a patient assistance program referral tool in partnership with DHTS
- Implementation of PharmTrac.PD in the Cancer Center Infusion Pharmacy
- Significant preparation and training for the transition of retail pharmacy systems to Epic

*Clinical pharmacist expansion in multiple clinics*

**Our People** (Not all team members are shown)



Oncology Clinic Pharmacist



Duke Specialty & PAP Team



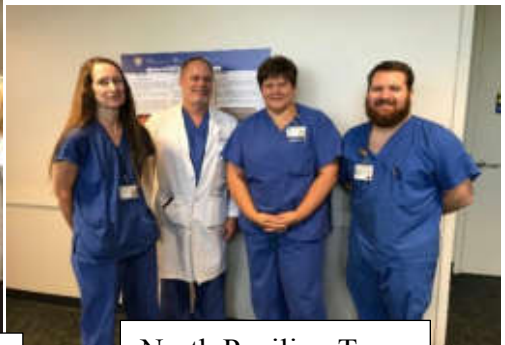
Endocrine Clinic Pharmacist



Cancer Center Infusion Team



Ambulatory Pharmacy Leadership



North Pavilion Team



Children's Health Center Pharmacy Team



Oncology Clinic Pharmacists



Duke Outpatient Clinic Pharmacy Team

### Overview of services

Central Pharmacy Services is composed of three separate operating departments inclusive of the Duke Compounding Pharmacy, Perioperative Pharmacy Services, and Pharmacy Procurement, Repackaging, and Distribution.

- *The Duke Compounding Pharmacy* prepares Compounded Sterile Preparations (CSPs) in compliance with the United States Pharmacopeia – National Formulary compounding standards to support DUH and DUHS Pharmacies and Clinics. Duke Compounding Pharmacy supports the organizational mission to support patient safety by preparing medications in ready to use medication packages, and the research mission of DUH by supporting specialized pharmaceutical needs in collaboration with investigational drug services.
- *Perioperative Pharmacy* serves pre-, intra-, and postoperative patients at DUH by providing highly specialized clinical and technical pharmacy services to enhance surgery outcomes. The staff support this goal by collaborating with surgeons, anesthesiologists, nurse anesthetists, nurses, and other ancillary staff to deliver patient centered care, by facilitating safe and appropriate use of medications.
- *Pharmacy Procurement, Repackaging, and Distribution* services provide logistical support by being responsible for purchasing and distributing medications to DUH and DUHS Pharmacies and Clinics. Annual drug expense for DUH Pharmacies in 2018 was over \$300 million. The department uses highly innovative inventory management systems and high-speed solid and liquid packaging technology to organize and manage the supply chain efficiently.



### Locations and Hours of Operation

The Duke Compounding Facility operates 5:00 AM – 10:30 PM (M-F). Designated pharmacists and technicians are available for after-hours emergency support for patient care needs. The pharmacy is located in Duke South, room 0010, Davison Building.

Perioperative Pharmacy services operate two shifts (6:00 am – 10:30 pm) via the decentralized pharmacy satellites located on the 3<sup>rd</sup> Floor in the Duke North and Duke Medicine Pavilion. The Eye Center Perioperative Pharmacy services are available 6:00 AM – 3:15 PM (M-F).

The Pharmacy Storeroom (procurement) is open 24 hours and staffed from 5:00 AM – 11:30 PM (M-F) and 6:30 AM – 3:00 PM (Weekends).

### Major Accomplishments

- Coordinated and supported preparations for USP 800 (capital funding, closed system transfer devices, and policy development)
- Collaborated with Anesthesia leadership to develop numerous drug diversion prevention initiatives
- Supported the onsite 503B compounding facility consultant site visit and implemented an action plan to become ready for the future state

*DUH Compounding Facility and Pharmacy Procurement combine to prepare over 160,000 sterile and non-sterile unit doses of medications every month*

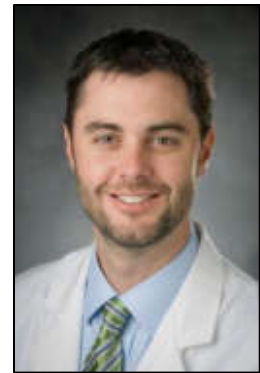
- Supported the Pharmaceutical Wholesaler RFP decisions and selection of prime vendor (VAT)
- Managed the transition of the inventory management vendor to improve efficiency and reduce costs of service
- Transitioned work unit productivity measurement from fixed to variable for the Duke Compounding Facility
- Replaced equipment including Baxa repeater pumps, balance scales, mixer, and high speed color label printers.
- Developed the database for Verilink Rx – analytical testing of controlled substances
- Developed new draft policy on anesthesia medication management
- Installation of new CACI (isolator) at the Eye Center Pharmacy
- Secured new space and renovation funds to safely receive hazardous drugs separately (USP 800) in the pharmacy storeroom
- Implementation of new packaging machine for hazardous drugs (Pearson Medical)

*Established a new Pharmacist role to focus on health system emergency preparedness*

**Team Members**

The Central Pharmacy Services team delivers exceptional services to our internal and external customers utilizing the knowledge, skills, and experience of engaged managers, coordinators, pharmacists, and pharmacy technicians. Staff members actively support the department’s mission by participating in clinical quality and process improvement efforts, promoting and fostering a positive work culture, and making the best use of medications to produce positive patient outcomes and customer experiences.





### Overview of services

The Clinical and Patient Care Services Division (CPCS) comprises all adult inpatient medical and surgical areas and their related specialty areas.

- The pharmacy practice model employed within CPCS is an integrated model consisting of team-based services (e.g. nutrition support, anticoagulation, transplantation), and unit-based services for all inpatient care areas.
- Clinical services include medication monitoring programs and pharmacist protocols, provider order verification, targeted patient education, emergency response, targeted high risk discharge medication reconciliation, and verification of patient medication histories.
- Clinical pharmacists participate in daily patient care rounds for most medical and selected surgical services.
- Pharmacists maintain competency to recognize and manage the pharmacotherapy needs of adult and geriatric patients.
- Pharmacists serve as primary and team-based preceptors for the University of North Carolina Eshelman (UNC) and Campbell University Schools of Pharmacy and for our Duke University Hospital Pharmacy Residency Programs.
- Clinical services, including clinical monitoring and order verification, operate from the Medication Management Center on evenings, overnights, weekends, and holidays.
- Clinical pharmacists also participate actively on departmental, hospital, and health-system committees involving quality improvement initiatives, informatics, medication policy, clinical research, and medication safety.

### Availability:

Pharmacists provide services during day shift, Monday through Friday in direct patient care areas, and through order verification and clinical services in the Medication Management Center during weekday evenings, weekends, holidays, and overnight.

### Major Accomplishments

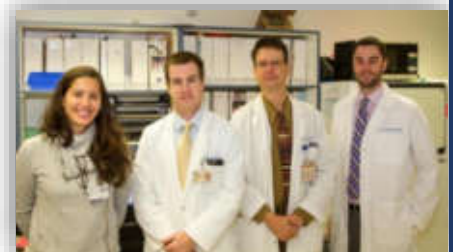
- Implemented Maestro Care Optimization Committee for CPCS to assist identifying and implementing system improvements.
- Expanded usage of Maestro Care Handoff Tool.
- Implemented additional high-risk discharge pharmacist services in General Medicine and General Surgery.
- Implemented additional night shift resources.
- Continued Quality Improvement assessments for our clinical programs.
- Participated in discharge medication reconciliation pharmacist pilot project for patients being discharged to local skilled nursing facilities.
- Provided support to the profession through publications, posters, and presentations.
- Staff recognized as outstanding preceptors by the Duke University Hospital Pharmacy Residency Programs and by the Campbell University and UNC Eshelman Schools of Pharmacy.
- Continued support of CPCS Work Culture Committee.
- Supported staff member attendance at regional and national conferences.

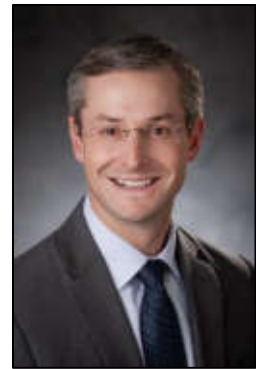
*Optimized hemodialysis medication administration and documentation process*

*Increased the number of high-risk discharge pharmacists*

## Our Team

The CPCS team consists of well-trained, highly committed pharmacists who work collaboratively with internal and external customers to meet medication needs of adult patients at Duke University Hospital. Many staff members have greater than 5 years of experience at Duke, and many are trained to work in their specialty area as well as other areas within the division. Many pharmacists have completed one or two residency programs, and are board certified in their practice area. Several pharmacists hold full-time or adjunct faculty appointments at the UNC Eshelman School of Pharmacy and/or the Campbell University College of Pharmacy and Health Sciences. CPCS staff members also actively support the department's mission through ongoing participation in quality, safety, and process improvement efforts, research activities and resident and student education. Many CPCS staff are active members or hold leadership roles in state and national pharmacy organizations. Others have made contributions to the profession through publications and presentations at both local and national organizational meetings.





### **Overview of services**

The Department of Pharmacy Inpatient Operations Division provides an array of services which support care of patients in both the inpatient and outpatient arenas. These services include:

- Sterile preparation and distribution of both hazardous and non-hazardous medications in a USP 797-compliant environment
- Unit dose medication distribution utilizing a hybrid model which involves the use of patient care unit-based automated dispensing cabinets (ADC), unit dose cart-fill, and first dose dispensing
- Comprehensive ADC management
- Controlled substance management
- Code cart procurement, assembly, distribution and maintenance
- Overnight medication preparation, verification and distribution

### **Locations and Availability:**

Duke University Hospital, zero level, room 0415 and Duke Medicine Pavilion, room 6W60. Services that are provided by the Inpatient Operations Division are available 24 hours a day, 7 days a week.

### **Methods of Drug Distribution**

Our goal is to have the medication available at the patient care unit before the care nurse needs it for a patient. To meet this goal, we use different mechanisms to transfer medications from central pharmacy to the patient care unit. The most common methods, however, involve the use of highly motivated pharmacy technicians, who make routine deliveries, and STAT technicians who deliver urgent and emergent medications. The pneumatic tube system is another means by which medications are delivered to the patient care unit.

### **Use of Technology to Enhance Safety and Operational Efficiency**

Several technology systems and software are utilized daily by staff members to accomplish the division tasks. Some of these key systems include:

- Automated compounding devices primarily used to support parenteral nutritional admixtures, eliminating the need for multiple manipulations.
- Dispense Prep and Dispense Check barcode scanning solution which complements the work of both the technician and the pharmacist by providing added verification that drug product selection is accurate.
- Automated dispensing cabinets which provide secure storage of medications while supporting timely availability of medications to the nurse following verification by a pharmacist.
- Controlled substance monitoring software used for tracking movement of scheduled medications and report generation for monitoring and quality assurance.
- Targeted barcode verification of specific high alert medications prior to dispensing or loading into an automated dispensing cabinet
- The i.v.STATION robot assures accurate preparation of sterile products through the use of gravimetric technology. Currently utilized for non-patient-specific preparations.
- Carousel technology is used for drug storage and dispensing. Includes guiding light and barcode technology which help assure accurate medication dispensing practices.
- PharmTrac.PD technology is used for tracking the location of medications once dispensed from the central pharmacy.

## Major Accomplishments

- Improvement in robotic dose production to over 6700 doses monthly
- Significant contributions to the Pharmaceutical Utilization Management Program
- Migrated Automated Dispensing Cabinet Access to an Active Directory authentication
- Partnership with Omnicell to install 12 Omnicell XT automated dispensing cabinets as well as partnership to develop stock location optimization algorithm to maximize pharmacy and nursing efficiency
- Digitizing critical inventory reporting to mitigate and increase detection of potential drug shortages
- Implemented Tier I daily safety huddles
- Implemented carousel optimization and dashboards in the central pharmacy
- Developed standard operating procedure for recycling of compounded sterile products
- Significantly reduced on-hand non-formulary inventory
- Expanded extended stability data for several compounded sterile products
- Updated Controlled Substance Handling and Automated Dispensing Cabinet Management policies to reflect revised regulatory guidance and ISMP best practices

*More than 6700 doses produced by robotics monthly*

*Implemented Tier I daily safety huddles*

## Our Team

The Inpatient Operations team is made up of well-trained, highly committed pharmacists and technicians who work collaboratively with internal and external customers to meet the needs of patients at Duke Hospital. Many of the staff members have greater than 5 years of experience at Duke and are cross trained to work across different areas of the division. Staff members actively support the department's mission through ongoing participation in quality and process improvement efforts, resident and student education, as well as, research activities.







**Overview of services**

The Department of Pharmacy, Women's and Children's Division provides clinical and distributive services which support the care of pediatric patients and obstetrics-gynecology patients in the inpatient setting (~240 licensed beds). Distributive services are supported on the inpatient side by the 5th floor satellite pharmacy. Duke Children's Health Center ambulatory clinics are supported by a pediatric infusion center pharmacy located on the 4th floor of the Health Center.

**Inpatient pharmacy services**

- Practice models within the pediatric division are both integrated as well as specialized. Clinical pharmacists participate in daily patient care rounds to develop individual pharmacotherapy plans, provide medication and dosage recommendations/adjustments, pharmacokinetic evaluation and dosing, parenteral nutrition management, code and rapid response participation, education, research and publication.
- Specialized practice areas include pediatric bone marrow transplant (16 beds), pediatric intensive care (16 beds), pediatric cardiac intensive care (13 beds), and neonatal intensive care (67 beds) units.
- General pediatric pharmacists care for patients on several services, including general pediatrics, hematology-oncology, cardiology, neurology, gastroenterology, solid organ transplant and allergy/immunology.
- The 5th floor satellite pharmacy supports the medication needs of these patient populations in collaboration with the Inpatient Operations Division.

**Ambulatory pharmacy services**

- The Children's Health Center Pharmacy is a sterile compounding facility located on the 4th floor of the Children's Health Center.
- Both low- and medium-risk doses of hazardous and non-hazardous compounded sterile preparations are provided to ambulatory pediatric patients.
- Clinical pharmacists, in collaboration with providers, monitor appropriateness of drugs, dosage, frequency, and adherence to protocols. Additionally, clinical pharmacists and technicians support investigational drug use.

**Mission**

To deliver optimal patient- and family-centered pharmaceutical care through evidence-based practice.

**Goals**

- To optimize medication therapy
- To prevent adverse effects
- To continuously improve medication safety for our patients and families
- To be a leader in best practices
- To be a leader in innovative research that contributes to prevention and effective treatment of childhood diseases
- To contribute to the overall body of knowledge

## Availability

Duke Children's inpatient pharmacy services are provided 24 hours per day, 7 days per week through the clinical and distributive staff and satellite pharmacy. The Pediatric Pharmacy division collaborates with Inpatient Operations to provide comprehensive services. The Children's Health Center Ambulatory Pharmacy operates from 8:00 AM to 5:00 PM, Monday through Friday. Weekend coverage is provided through inpatient services.

## Major Accomplishments

- Monthly pharmacist-led pediatric pharmacotherapy presentations to enhance staff competency
- Updated Alaris pumps with oncology medications
- Policy management
  - Calcium gluconate policy added to list of other electrolyte policies
  - Revised and updated the Safe Prescribing and Dispensing of Chemotherapy in Pediatrics Policy
    - Addition of a new workflow for vinca alkaloid preparation and dispensing in the Children's Health Center aimed at increasing patient satisfaction
- Leading design of the pediatric pharmacy and staffing model alignment for the Bed Tower Addition
- All pharmacist shift descriptions updated to include recent changes to workflows and shift times
- Implemented virtual kits: anaphylaxis virtual kits in 5100 and antiepileptic kit in CHC
- Standardized vinca alkaloid preparations to IVPB
- Oral syringe batch revisions to better align with workflows and shift times and decrease waste
- Additional shift descriptions added to provide detail around additional weekend pharmacist shift and additional dayshift pharmacist position within the Pediatric Cardiac and Complex Care Unit
- Expanded clinical services in ambulatory setting to the Children's oncology clinics and Cystic fibrosis clinic
- All oral syringe compounding recipes updated based on current literature
- Antibiotic lock policy aligned with EHR ordering
- Continued weekly Pharmacy and Nursing rounds
- Daily Children's CSU Tier II Huddles
- Daily Tier I Huddle implementation in PICU, 5100, PCICU, PC3
- Pharmacist publications in the Journal of Contemporary Pharmacy Practice
- Pharmacist poster presentations at the Society of Critical Care Medicine Annual Congress and the American Society of Health-System Pharmacists Midyear Clinical Meeting
- Duke Outpatient Cystic Fibrosis Pharmacist Grant awarded
- Two preceptor of the year awards nominations, one preceptor of the year award
- Process mapping for spinal muscular atrophy agent, Zolgensma®
- Continued Beacon protocol review
- Continued weekly Pediatric Pharmacy Safety Huddles
- Implemented Pediatric IV Huddles with Sterile Processing Cleanroom staff

Safe Prescribing and Dispensing of Chemotherapy in Pediatrics Policy Revisions

Addition of chemotherapy to pediatric Alaris pump libraries

Expansion of pediatric ambulatory services

## **Our Team**

The pediatrics team is comprised of well-trained, highly committed pharmacists and technicians who collaborate with medical and nursing staff and colleagues to optimize medication use among a high-risk, vulnerable patient population. Many staff members are tenured and cross-trained to function and support multiple sub-specialty practice areas. A number of pharmacists have completed one or two residencies. The majority of pediatric pharmacists are board certified in pharmacotherapy, oncology and/or pediatrics. Staff members actively support the department's mission through ongoing participation in quality and process improvement efforts, resident and student education, as well as research activities. Pediatric pharmacists are frequently recognized for their dedication to patient safety through Good Catch Awards.

## **Committee Memberships**

Institutional Review Boards	Children's Pharmacy & Therapeutics Committee
Children's Core Safety Team	DUH Medication Safety Committee
Pharmacy Core Safety Team	DUHS Anticoagulation Task Force
Pediatric ADE Committee	Formulary & Informatics Subcommittee
Pediatric Chemotherapy Safety Committee	Pharmacy Oncology Committee
Women's Core Safety Committee	Pediatric Sedation Committee
ICN Executive Committee	Pediatric Nutrition Support Committee
ICN Morbidity and Mortality Committee	PICU/PCICU Morbidity and Mortality Committee
DUHS Smart Pump Quality Oversight Committee	PICU/PCICU Patient Safety and Clinical Quality Committee
ICU/Anesthesia Formulary Evaluation Team	Oncology Formulary Evaluation Team
Pediatric Pain Committee	Code/RRT/Performance Improvement Committee
Pediatric Critical Care Medicine Leadership Committee	Pediatric Emergency Response Committee (PERC)
Work Culture Committee	Employee Activities Committee
ICN Medication Safety Alliance	Residency Advisory Committees
Pediatric Preceptor Development Committee	DUH Preceptor Development Committee
Nephrotoxic Induced Acute Kidney Injury (NAKI-SPS)	Venous Thrombosis Emboli Prevention committee (VTE-SPS)
Weekly Pediatric Safety Huddle	Daily Pediatric CSU Huddle
PICU Huddle	5100 Huddle
Glycemic Safety Committee	PGY2 Pediatric RAC
Pharmacy Anticoagulation Committee	Sterile Preparations Oversight Committee
Pharmacy Core Safety Committee	Pediatric Nursing Clinical Practice Council



Good Catch



4th Good Catch!!

## Administrative Services

Evan Frasure III



### Overview of services

The administrative services team strives to improve quality and perform essential administrative functions within the department of pharmacy at Duke University Hospital. Services provided include:

- Pharmacy administration office management
- Human resource and payroll processes
- Conduct routine and random environmental and personnel testing for the 11 sterile preparation areas at Duke University Hospital
- Manage the departmental intranet and internet sites by maintaining up to date information and responding to various inquiries
- Oversight of the DUHS Controlled Substance Diversion Prevention program
- Perform monthly medication area inspections to improve patient safety and regulatory compliance
- Coordination of educational efforts including the pharmacy resident teaching certificate program, out of state student rotation requests, and pharmacy shadowing opportunities
- Administrative oversight for smart pump drug libraries, regulatory readiness, and department performance metric tracking

### Our Team

The administrative services team has staff in various areas and includes:

- Two (2) Pharmacy Administration office staff including our office administrative assistant and department human resources (HR) specialist
- Two (2) Quality Assurance pharmacy technicians – Sterile Preparations and Medication Area Inspector
- One (1) Director – Controlled Substance Diversion Prevention (CSDP)

Our team highlights advanced pharmacy technician roles in quality assurance available within the Department of Pharmacy at Duke. The Pharmacy Administration office staff members serve the department of pharmacy through numerous administrative functions.

### Availability

Our office-based team is available during regular business hours and can be reached by calling the Pharmacy Administration office during normal business hours at 681-2414. The quality assurance pharmacy technicians and CSDP director are available through the Duke paging system or by calling the Pharmacy Administration office.

### Major Accomplishments

- Collaboration with the Duke Forge group on anesthesia analytics program
- Statewide and national organizational participation to continue growing our CSDP program and knowledge sharing
- Implementation of pharmacy inventory audits across the health-systems inpatient and retail pharmacy locations
- Inclusion of an infection prevention representative as a key member of the CSDP committee
- Engagement with the DUH Nurse Leader Development Program to increase awareness and education for nursing leaders around diversion prevention
- Increased awareness of controlled substance regulations throughout the organization through department and unit staff meetings
- Expanded the smart pump drug library for all areas of the hospital with an emphasis on antibiotics and pediatrics

*Statewide and national  
organization  
knowledge sharing*

## Pharmacy Finance, Business Intelligence and Analytics

Gene Rhea



### **Overview of services**

The Pharmacy Finance, Business Intelligence and Analytics team provides oversight and ensures the integrity of business and financial considerations of the department including accounting, revenue management and the 340B Drug Discount Program. The team is also responsible for identifying and coordinating implementation of growth opportunities across the Department of Pharmacy in alignment with the overall objectives of the organization. Specific functions of the Business Development and Integrity team include:

- Managing the daily business and financial functions of the department
- Developing business plans to support recognized growth opportunities
- Overseeing inpatient, outpatient and retail pharmacy revenue and ensuring adequate record keeping, receipt and reporting of revenue
- Coordinating, in collaboration with DUH Finance, completion of the annual operating budget process
- Collaborating with accounts payable on purchasing needs and vendor invoicing/payments, conducting account reconciliation as needed
- Overseeing the process for month end financial closure for the department
- Preparing reports to evaluate productivity, expenditures and profitability
- Maintaining working knowledge of applicable federal, state, and local laws and regulations governing the 340B program and revenue management
- Developing and maintaining the organization's policies and procedures related to the 340B program, Maestro Care and retail pharmacy revenue management processes, including price file integrity
- Maintaining a quality assurance audit plan and performing audits on a periodic basis to ensure compliance with current 340B program regulations
- Planning, developing, organizing, implementing, directing, enforcing, and evaluating the organization's compliance and continuous effectiveness of the 340B program
- Monitoring and managing automated split billing software and Maestro Care/Willow Ambulatory to ensure proper matching of NDCs and working closely with the software vendors and DHTS team members to resolve related problems
- Maintaining accurate and complete records and documentation related to the 340B program and MC Pharmacy revenue and price files
- Providing timely and accurate reporting or analysis of compliance with 340B program requirements and drug price file integrity

### **Our Team**

The Pharmacy Finance, Business Intelligence and Analytics team includes:

- Director – Pharmacy Finance, Business Intelligence and Analytics
- Accountant
- Accounting Clerk
- Two Revenue Management Pharmacy Technicians
- 340B Program Specialist

### **Availability**

Our team is available during normal business hours by calling the Pharmacy Administration Office at 919-681-2414.

### **Major Accomplishments**

Coordinated conversion from Talyst Autosplit to Verity v340B virtual software for 340B split billing

- Successfully completed HRSA 340B audit
- Convened monthly meetings of the DUH 340B Oversight Committee
- Conducted quarterly comprehensive 340B self-audits
- Completed midyear and year-end physical inventory analyses
- Completed annual Maestro Care pharmaceutical price update and validation
- Coordinated financial and 340B aspects of Willow Ambulatory conversion
- Convened biweekly meetings of the mixed-use WAC minimization work group

*Coordinated  
conversion from  
Talyst Autosplit to  
Verity v340B  
software for virtual  
340B split-billing*





**Overview of services**

The Center for Medication Policy (CMP) is a team within the Department of Pharmacy that collaborates with healthcare professionals across the health system to promote safe, effective and fiscally responsible use of medications. The CMP integrates its activities with the clinical, safety, informatics, administrative, and drug distribution systems of the Department to optimize medication use for patients.

Services include:

- Respond to patient specific and general inquiries regarding all aspects of medication use.
- Provide accurate, timely, unbiased evidence-based drug information in support of rational medication therapy and policy.
- Provide support to the Pharmacy & Medication Management Committee, Pharmacy & Therapeutics Committee (P&T), and the respective subcommittees (Formulary Evaluation Teams, Formulary & Informatics Subcommittee, and Medication Safety Subcommittee).
- Participate in formulary management activities. Support the dissemination of drug information and medication policy updates via the Center for Medication Policy webpage, electronic newsletters, and staff meetings.
- Participate and support the conduct of medication use evaluations (MUEs). Query the MUE Universe tool to collect retrospective and real time medication utilization data for analysis for a variety of stake holders including P&T, Pharmaceutical Utilization Management Process (PUMP) and Value Analysis Team (VAT). This is one way in which adherence to formulary policies can be assessed.
- Monitor and assist with the implementation of drug shortage action plans.
- Track and develop medication specific Risk Evaluation and Mitigation Strategies (REMS) programs.
- Review FDA safety communications to facilitate changes to formulary policies and informatics systems.
- Review and track departmental drug information reference subscriptions.
- Provide a learning environment in which pharmacy students and residents can acquire or enhance skills necessary to research and respond to medication related queries and review and develop formulary related policies.
- Train a Drug Information Resident in collaboration with GlaxoSmithKline, that provides a learning environment for the resident to acquire and develop skills integral to the practice of hospital based drug information and med use policy.

**Major Accomplishments**

- Lead formulary review through a health system process that supports 9 Formulary Evaluation Teams (FET) to meet the desired health system goals as outlined in the FET charter.
- In FY19, the Committees completed formulary reviews for over 50 medications.
- In FY19, 6 therapeutic interchange programs were implemented as a means to guide the use of formulary medications.

*Approximately 40 drug shortage action plans implemented*



- Collaborated with pharmacists and technicians from IT, operations, procurement and business finance to devise processes for implementing formulary changes and policy updates into IT systems in a timely manner.
- Maintained an up-to-date Center for Medication Policy website that provides current medication formulary and policy information. This website is accessible across DUHS.
- Medication Stewardship pharmacist coordinated the Pharmacy Utilization Management Program (PUMP). In FY19, 28 operational, procurement, and utilization initiatives were actively tracked.
- Monitored non-formulary medication use and made suggestions for change to reduce overall utilization. Contributed to achieving the balanced score card performance target for non-formulary medication use.
- Supported the drug shortage policy by participating in the development and implementation of drug shortage action plans.
- Monitored the volume of medication alerts firing via Maestro Care. Actions approved at PMMC to reduce non-essential alerts.
- Collaborated with the Pharmacy Education Committee to develop research project ideas for 10 UNC students to complete research projects at Duke.
- Manage review of departmental policies. Started processes to integrate pharmacy policies into the new DUHS Policy Center.
- Completed Model 1 of the Duke Institute for Health Innovation (DIHI) grant project aimed at identifying patients at risk for developing steroid induced hyperglycemia.
- Collaborated with a Duke primary care clinic to implement preemptive pharmacogenomics testing in select patient populations. The CMP participated in patient education sessions and serves as a consultative group to assist with medication related questions resulting from testing.

*Supported the formulary review of 50 medications and completion of 15 MUEs*

*Precepted 12 P4 pharmacy students and five pharmacy residents on their DI rotations*

### **Our Team:**

The CMP team is made up of well trained, highly committed pharmacists who work collaboratively with those in the Department and throughout DUHS to help in the review and development of processes that meet the medication needs of patients. All team members have completed one or two residency training programs, and some team members are Board Certified Pharmacotherapy Specialists and designated Clinical Pharmacist Practitioner. All support the department's mission through ongoing participation in quality and process improvement efforts, resident education, and research activities. Team members are members of state and national pharmacy organizations. The team makes contributions to the profession through internal and external publications and presentations.



**References:**

The CMP maintains an up-to-date core library of medical, pharmacology, and pharmacy practice texts and electronic references. Drug information references are evaluated as needed for suitability and need for purchase or renewal.

**Locations and Hours of Operation**

The CMP is located on the 0 level of Duke North Hospital across from North Central Pharmacy, and is staffed Monday through Friday from 8 AM to 5 PM. After hours consultations are provided by an on-call system (pager 919-970-8110). Non-emergency requests may be left on voicemail (919-684-5125) or shared via email.



### Overview of services

The Department of Pharmacy Investigational Drug Services (IDSs) supports clinical research involving study drugs for Duke Investigators and supports safety and care for subjects in both the inpatient and outpatient care areas as well as Duke Early Phase Research Unit for Phase I Studies. The IDSs integrates activities with clinical, safety, informatics, administrative, and drug distribution systems of the Department to optimize study drug therapy for patients.

These services include:

- Creation of study drug orders in Maestro Care
- Integrity of blinding
- Regulatory compliance
- Prevention of errors involving study drugs
- Dispensing of investigational products in a timely manner
- Contribution to study design and data integrity
- Randomization and study drug accountability
- Aseptic preparation of IV's in a USP 797-compliant environment and distribution of both hazardous and non-hazardous study drugs
- Procurement of drugs and supplies for studies as needed
- Creation of Drug Data Sheets for study drugs used for inpatients
- In-services and education for inpatient studies
- Collaboration with DUH pharmacies to prepare and dispense study drugs as appropriate for patient care
- Support for Expanded Access drugs needed for patient care
- Education of Pharmacy students and residents regarding the research process, IDS team member roles and evaluation of literature

### Availability and Location

Study drugs are received and dispensed from three primary areas, the Investigational Drug Service (IDS), the Investigational Chemotherapy Service (ICS) and the Infectious Diseases Research Pharmacy (IDRP). The IDSs are staffed Monday through Friday from 8 AM to 5 PM. Arrangements are made to ensure study success for subjects needing study drugs outside of these hours. A team member from all services is on-call 24/7. (IDS on-call pager 970-8392; ICS on-call pager 206-9090 and IDRP: individual team members via paging web). Non-emergent requests may be left on voicemail (IDS: 684-3543; ICS: 668-0657; IDRP: 681-1788). The IDS is located on the basement level of Duke Clinic at room 0101b, Yellow Zone. The ICS is located within the Cancer Center Infusion Pharmacy on the fourth floor, room 4N33, and the IDRP is located in Duke Clinic within the infectious disease clinic 1K, room 1346.

### Major Accomplishments

- Maestro Care:
  - Created study drug builds for all IRB approved studies using our services; a 15% increase from the previous year
  - Validated approximately 220 order sets/protocols containing study drugs
  - Ongoing collaboration with DOCR, IRB and study teams for validation of study drug order sets/protocols and study drug for standardization and enhanced safety
- ICS and IDS:
  - Participated in 112 audits

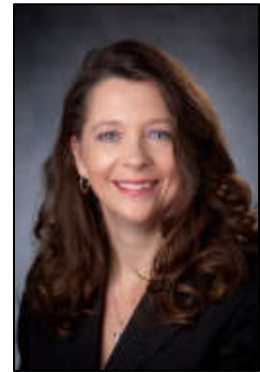
*Validated 220 order sets/  
protocols containing study  
drugs*

- ICS participated in National Clinical Trials Network (NCTN) audits (CITN, NCE and CTSU SWOG)
  - Had 1,181 monitoring visits to include site initiation, interim monitoring and close-out
  - Implemented Vestigo access for study monitors
  - Created Willow builds for 220 separate protocols
  - Utilized access to the DOCR redcap site to increase study drug build completion before IRB approval; IDS rate = 88%, ICS rate = 88%
  - Overall, 3.2% increase in dispenses, 45% increase in monitor/audits/SIVs, 8% increase in the average number of open studies
  - Worked with P&T and ORAQ to improve process of assisting physicians and regulatory teams to more efficiently implement Expanded Access drug access.
  - Hosted 7 students/visitors (3 residents, 2 PY4 students, 2 immersion students)
  - Presented posters to highlight the work and support provided by the ICS for oncology research studies at the Basic Science Day DCI Scientific Retreat and CCSG site visit
  - IDS's hired 2 new pharmacists to support DRaH expansion and compounding needs
  - CCSG site visit support for renewal of DCI Core Grant
  - Successfully implement new HR titles for IDSs staff to mirror school of medicine
  - Identified challenges and options for hazardous drug storage to meet USP 800 compliance for investigational drugs
  - Collected metrics regarding shipments and IV preparations; pharmacist double check of all shipments in IDS documented
  - Work with team to share space in Morris pharmacy for IV preparations and storage space for IV study drug medications
- Hired 2 new pharmacists to support DRaH expansion*
- IRB Coverage: with the help of department of pharmacy pharmacists, 88% (79/90) IRB meetings were covered by a pharmacist

### **Our Team**

The Investigational Drug Service teams are made up of well trained, highly competent and committed pharmacists, clinical trial specialists, clinical research coordinators, and an accounting clerk II. IDS members work collaboratively to meet the needs of study coordinators, investigators, sponsors and subjects throughout the Duke Health System. Most staff members have greater than 15 years of experience at Duke and with research for at least 8 years. IDS, ICS and IDRP Team members support the department's mission through IRB membership, Clinical Research Unit membership, participation in quality improvement efforts, resident/ student education, as well as research activities.





### Overview of services

Three pharmacists and one full-time data administrator comprise the dedicated and experienced staff in the Medication Safety division. Services provided include:

- Manage, investigate, and score medication-related events reported via the Safety Reporting System (SRS)
- Oversee the peer review process for medication-related SRS events
- Generate monthly and quarterly reports which permit ongoing monitoring, trending, and analysis of medication related safety issues
- Prepare ad hoc and custom reports to support the safety efforts at local, clinical service unit, institution and health system levels
- Guide safety committee/team discussions to focus on actions to address root causes
- Distribute of the Institute for Safe Medication Practices Newsletter biweekly
- Develop formal and informal safety data presentations tailored to audiences across the health system
- Consult regarding specific safety issues, new products, and label changes
- Educate and promote safe medication practices

### Locations and Hours of Operation

The Medication Safety Office is located in Duke North Hospital across from the North Central Pharmacy. Our office is staffed weekdays from 7 AM to 5 PM. Services are covered by pager at all times.

### Major Accomplishments

- Maintained an active and engaged Medication Safety Committee
- Continued to lead and participate on multiple clinical service unit (CSU) level and specialty safety committees
- Participated in medication related root cause analyses and learning from defects meetings
- Encouraged and recognized pharmacy department participation in SRS reporting which resulted in a 6% increase in number of individuals reporting medication-related events who identified themselves as pharmacists or pharmacy technicians (333 in FY19 from 314 in FY18).
- Generated more than 17 adhoc reports were created for quality improvement and medication safety initiatives.
- Provided education and guidance to file managers interested in RL Solutions report writing tools, created safety reporting templates to be utilized by file managers and refined multiple file manager scopes.
- Used refined trigger tool to identify suprathreshold INRs (>5) associated with warfarin. The Medication Safety Pharmacists submitted these events via the Safety Reporting System. Between July 2018 and June 2019, 70 patient charts were reviewed with 32 adverse warfarin events identified (46% positive predictive value). 24 of the 70 warfarin events (34%) were considered potentially preventable. Risk reduction strategies have been implemented and as a result of lessons learned.

*“Good catch” ADE reporting maintained at 50% for 2<sup>nd</sup> consecutive year*

*Reviewed, investigated, and analyzed 6292 medication-related SRSs*

- Implemented 223 documented system improvements, enhancements and optimizations resulting in safer medication use.

### Our Team



## Antimicrobial Stewardship

## Christina Sarubbi



### Overview of services

The Antimicrobial Stewardship and Evaluation Team (ASET) is dedicated to enhancing the quality of antimicrobial use throughout Duke University Hospital. ASET works collaboratively with clinical pharmacists, medical staff and other healthcare workers to provide safe, efficacious, and cost-effective drug therapy to optimize outcomes in patients with infectious diseases.

In FY2019, the financially sustainable initiatives that facilitated optimal antimicrobial prescribing included:

- Conducting prospective audit and feedback for antimicrobial prescriptions
  - Optimizing antimicrobial dosing
  - Determining duration of therapy
  - Targeting therapy based on additional diagnostic information
  - Transitioning to oral administration
  - Consulting Infectious Diseases for *Staph aureus* bacteremia
- Pharmacist-managed inpatient penicillin allergy assessment and skin testing program and outpatient referral system
- Conducting “handshake rounds” with adult hospitalist and pediatric providers
- Collaborating with Microbiology to implement rapid diagnostic testing for bloodstream infections

### Major Accomplishments

- Expanded our pharmacy stewardship team which enabled us to extend our reach
- Launched new rapid diagnostic testing with BioFire and Accelerate Pheno
- Developed or updated the following policies and guidelines: Adult and Pediatric Antibiotic Lock, Adult Febrile Neutropenia, Colistin/Polymyxin B Dosing, Open Fracture Prophylaxis, Pediatric Antimicrobial Duration of Therapy, Pelvic Inflammatory Disease
- Conducted 7 new drug monographs and 5 MUEs with the Center of Medication Policy
- Precepted 6 pharmacy resident months and 4 UNC pharmacy student months
- Rebekah Wrenn served as a PGY2 resident research advisor, and Christina Sarubbi served as preceptor for 3 student research projects
- Presented 3 posters at ID Week 2018:
  - Impact of education and data feedback interventions on outpatient prescribing for urinary tract infections
  - Duration of antimicrobial therapy: the impact of defaults
  - Inpatient penicillin skin testing: outcomes from a propensity-matched case control study

*Launched new rapid diagnostic testing for bloodstream infections*

### Our Team

#### ASET Pharmacists

Christina Sarubbi, PharmD, MBA, BCPS AQ-ID  
Justin Spivey, PharmD, BCPS  
Rebekah Wrenn, PharmD, BCPS

#### ASET Physicians

Rebekah Moehring, MD, MPH  
Mike Smith, MD, MSCE



Duke Center for  
Antimicrobial Stewardship  
and Infection Prevention

<https://dcasip.medicine.duke.edu/>

<https://www.customid.org/>

Email: [aset@duke.edu](mailto:aset@duke.edu)

Twitter: @Duke\_ASET



### Overview of services

The Duke University Hospital Adult Nutrition Support-Total Parenteral Nutrition Team (NSS-TPN) is a multidisciplinary collaboration between physicians, pharmacists, dietitians and nurses. It is a consult service for TPN that works in concert with the primary team, as well as the patient, to evaluate the need for specialized nutrition support for the adult patient population. Once the patient is determined to require specialized nutrition therapy, the team:

- Evaluates and determines the appropriate route of therapy including enteral or parenteral therapy
- Develops a nutrition care plan; verifying proper type, placement, and care of parenteral or enteral access including inserting enteral feeding tubes with a specialized device (Cortrak)
- Documents nutrition care plan and goal of therapy in the electronic medical record as agreed upon by the ordering team
- Initiates and manages patient specific parenteral nutrition for adult inpatients, including nutrition product evaluation and management of significant product shortages
- Initiates and manages patient specific enteral nutrition or diet until deemed appropriate to sign over to unit-based registered dietitians
- Evaluates drug therapy (including antibiotic therapy, prokinetic and antimotility agents, opioid sparing pain management, appetite stimulants, short bowel drug therapy, iron replacement, etc.), electrolytes, fluid and recommending changes as it pertains to nutrition care for the patient
- Reevaluate patient periodically to transition patient to a lower level of support, as appropriate (eg. Return to oral diet or transition from TPN to tube feeds)
- Coordinate transition to home or facility (when applicable including proper patient transport and providing guidance to other institutions for making TPN with their available products and vice versa)
- Manages patients receiving parenteral nutrition at home

For patients who require parenteral support after discharge, the NSS-TPN Team plays an integral role in evaluating the adult patient for appropriate therapy and providing guidance to discharge planners to request financial approval and home health services. The NSS-TPN Team provides support for Home Total Parenteral Nutrition (HTPN) patients by:

- Coordinate training to the patient and/or caregiver to be independent with the therapy in the home environment
- Monitor patient clinical condition for response to therapy. This is accomplished by weekly to monthly labs, reports from home nursing visits and clinical assessment via telephone or at clinic visits. Amount of intervention is dependent on patient stability and guidelines for this therapy
- Adjust TPN therapy, medications and diet as appropriate
- Goals are determined by collaborating with the Duke attending and primary care providers. Goals include weight gain, weight loss, avoiding complications of TPN therapy, preparation for surgery, transplantation, GI rehabilitation with diet and drug therapy such as Teduglutide an analog of glucagon-like peptide-2 (GLP-2), and fluid, electrolyte and nutrition maintenance
- Wean TPN therapy when nutrition therapy can be attained enterally
- Document all interventions in the electronic medical record.

The education of future nutrition support practitioners is facilitated through mentoring of pharmacists, dietitians, students, residents and other multidisciplinary staff



## Major Accomplishments

- Continued quarterly evaluation process of safety recorded events (SRS) related to TPN therapy. All SRS events from July 2018 to June 2019 were evaluated. Events were collated to examine the location, month, attributable causes and severity. Emphasis is placed on events depending on likelihood of causing harm, and frequency of occurrence. Focus is placed on identifying the sequence of events that resulted in a deviation from intended care then analyzing and implementing steps to deliver intended care.
- Continued to lead the monthly multidisciplinary Nutrition Council meetings to assist with the development and maintenance of skilled Nutrition Support practitioners for adults and pediatrics. Participants from several disciplines come together to discuss ways to provide safer, more effective TPN therapy. Multidisciplinary professional continuing education topics of presentation for the 2018-2019 year included: Nutrition and Fluid Optimization in Adults with Short Bowel Syndrome, Use of Vitamin D in Critical Illness, Enteral Nutrition to Treat IBD and EoE, Ethical Issues and Nutrition Therapy, Copper, Zinc, and Vitamin C.
- Duke has stopped TPN prior to surgery for 40 years over concerns for surgery site infections and possible electrolyte toxicity and paucity of research on this practice. Over concern for developing nutrition deficits, an initiative to continue TPN through surgery was implemented with approval from the Pharmacy and Therapeutics Committee (P&T) with the conditions that hourly blood glucose monitoring occur during surgery and chemistries followed after surgery to avoid/ identify patient complications. Process changes include nursing, physician and pharmacy education, changes in standing orders for the new policy, and using intra-op anesthesia “Active Reminders” to prompt anesthesiology to provide hourly glucose monitoring for the surgical case. Practice influence on glucose and electrolyte changes and compliance with new process is monitored to provide feedback to P&T on the safety of practice.
- Continued to build on the nutrition support forum. The forum provides resources for nutrition therapy and is located on the Pharmacy Department website.
- To support best practice and familiarize staff with the most up-to-date recommendations, topics discussed at Nutrition Council, when appropriate, launch the development of practice consensus guidelines on the management of the nutrition topic. So far, guidelines on management of copper, zinc and selenium are developed.

*Implemented new process  
to allow TPN to continue  
before surgery*





### **Overview of services**

Oncology pharmacy specialists at Duke provide patient care to adult and pediatric cancer populations in both the inpatient and outpatient settings. Clinical services are tailored to patient care needs and include but are not limited to pharmacotherapeutic medication management, therapeutic drug monitoring, pharmacokinetic dosing, nutrition support, drug information, symptom management, supportive care, and patient education. The pharmacy team is also responsible for safely compounding and dispensing chemotherapy. Pharmacists work collaboratively with other health care providers to provide safe, efficacious, and cost-effective drug therapy to optimize outcomes in patients with malignant diseases. Oncology practitioners are involved in the development, support, and management of research/investigational protocols. Additionally, the education of future pharmacy practitioners is facilitated through mentoring of pharmacy students and residents in a variety of clinical settings.

### **Locations and Hours of Operation**

Currently, oncology pharmacists practice in the following areas:

- Ambulatory Oncology Clinics
  - Hematologic Malignancies, Genitourinary, Gastrointestinal, Thoracic, Breast, Sarcoma, Brain Tumor, Adult Bone Marrow Transplant (BMT), GYN and Head and Neck
- Inpatient Oncology Services
  - Hematologic Malignancies, Solid Tumors, Adult BMT, Pediatric BMT, Pediatric Oncology
- Infusion Pharmacies
  - Cancer Center Infusion Pharmacy
  - North Pavilion
  - Rainbow Day Hospital
- Investigational Chemotherapy Services

### **Major Accomplishments**

- Continued support and development of standard of care Beacon templates supporting standardization and enhanced safety with chemotherapy regimens
- Continued development of standardized chemotherapy patient education materials
- Continued the Duke Oncology Pharmacy Oral Chemotherapy Management Program
- Contribute to maintenance of URAC Accreditation of Duke Cancer Center Specialty Pharmacy
- Continuation of call back program for patients at high risk for chemotherapy induced nausea and vomiting
- Continuation of regular oncology pharmacy meetings
- Six clinical pharmacist practitioners (CPP's) within the oncology group
- Participation in the Duke Oncology Network Pharmacotherapy Updates in Cancer Series
- Creating and sending a quarterly newsletter to oncology practitioners across Health system
- Support of PGY2 Oncology residency program and residents

*300+ Beacon  
chemotherapy  
regimens reviewed  
and developed*

**Oncology Pharmacist Team**





**Overview of services**

Population health pharmacy services are integrated with the Duke Population Health Management Office (PHMO) DukeWELL care management services. The Duke PHMO was officially developed November 1<sup>st</sup>, 2016 to bring together different population health services into a single entity. The goal of the Duke PHMO is to facilitate higher-quality care that results in a greater return on healthcare dollars. The PHMO is responsible for cost and quality for approximately 250,000 patients served by Duke Health and other providers that participate in the Duke Connected Care (DCC) and Northern Piedmont Community Care (NPCC) networks.

Specific population health pharmacy services include:

- Supporting DukeWELL care management with medication reviews and education
- Serving as an education and pharmacy resource for providers
- Communicating Medicaid policy changes to providers and community pharmacies
- Conducting pharmacy technician home visits for select patients with medication management or adherence concerns
- Collaborating with specialists in endocrinology, geriatrics, nephrology, palliative care, and cardiology to conduct chart reviews in DukeWELL rounding sessions to provide recommendations to providers and care management
- Utilizing PHMO reports to address medication-related quality measures or medication management improvement opportunities
- Collaborating with payer pharmacists and DukeWELL care management to develop strategies to improve medication-related quality measure performance
- Collaborating with external community resources, including community pharmacies, to improve medication management for DukeWELL eligible patients

**Locations and Hours of Operation**

- Our team is located in the PHMO offices at 718 Rutherford Street and at the NC Mutual Building at 411 W Chapel Hill St. We are available during normal business hours Monday through Friday by calling DukeWELL at 660-9355

**Major Accomplishments**

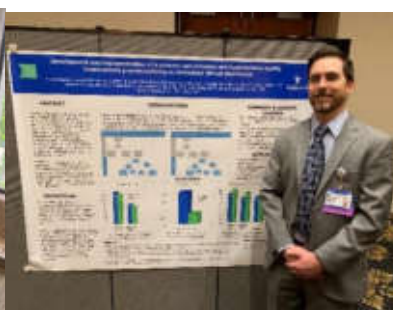
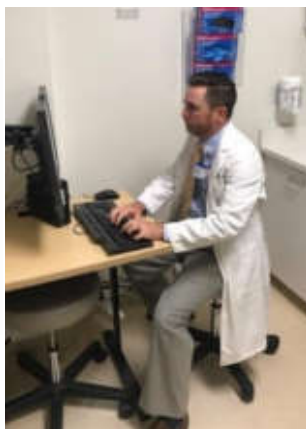
- Implemented new Maestro Care documentation that utilizes smart data elements for intervention tracking
- Successfully expanded staff with the hire of an additional Population Health Pharmacy Technician
- Successfully contributed to completion of the Duke Connected Care (DCC) annual Medicare Shared Savings Program (MSSP) quality reporting to the Centers for Medicare and Medicaid Services
- Expanded geographic service area for pharmacy technician home visits
- Implemented pilot referral program with DUH Gen Med teaching team for post-discharge pharmacy technician home visits
- Transitioned Medicaid documentation to Virtual Health platform. Increased Medicaid documentation in Maestro Care
- Expanded monthly PHMO Pharmacy Care Management CE In-service to additional Duke Health staff external to PHMO

*Expanded geographic service area for pharmacy technician home visits*

- Poster highlighting impact of embedded PHMO clinical pharmacist at DPC Knightdale presented at Duke Patient Safety and Quality Conference
- Contributed to Lincoln Pharmacy initiative that received the Rebecca Kirkland Award at the Duke Patient Safety and Quality Conference
- Description of pharmacy technician home visit program published in the American Journal of Health-System Pharmacy
- Collaborated with a pharmacy resident to complete a project to provide additional insight into CMS STARS medication adherence metric barriers

### **Team Members**

- Director, Population Health Pharmacy Services
- Population Health Clinical Pharmacists
- Population Health Pharmacy Technicians



## Transplant Pharmacy Programs

Matt Harris



### Overview of services

Clinical pharmacy services are provided for heart, intestine, kidney, liver, lung, pancreas, and vascularized composite tissue transplant patients across the continuum of care at Duke Hospital. Seven full time pharmacists and one PGY2 transplant resident comprise the pharmacy transplant team. Services provided include:

- Involvement in the care of patients and donors in the pre-, peri-, and post-operative settings
- Identifying, solving and preventing medication-related problems or deficiencies in the solid organ transplant population and living donors for the abdominal and thoracic transplant programs
- Documenting pre- and post-transplant immunosuppressive plans
- Providing education regarding the safe and effective use of medications in the post solid organ transplant population to patients/families and the healthcare team
- Assisting the transplant teams in medication protocol development, review, and revision on an on-going basis
- Development and management of investigator initiated research and Pharmacy Utilization Management Programs
- Training students and residents in a variety of clinical settings

### Locations and Hours of Operation

Inpatient services are provided by a Transplant Clinical Pharmacist seven days a week and all of the pharmacists are available by pager for after-hours questions or concerns. Currently transplant pharmacists practice in the following areas:

- Ambulatory Clinics
  - Abdominal Transplant
  - Thoracic Transplant
- Inpatient Coverage (CPCS)
  - Adult and pediatric abdominal transplant
  - Cardiac transplant/heart failure
  - Medical lung transplant
  - Surgical lung transplant
- Ambulatory Pharmacy
  - Duke Cancer Center Specialty Pharmacy

### Major Accomplishments

- Awarded two research grants (Duke Transplant Center Award \$20,000 and Haller Foundation Grant \$115,000) for a project titled: "The impact of a transplant video education curriculum on medication knowledge, adherence, and satisfaction in new kidney transplant recipients."
- Developed a pharmacy workflow to ensure access to HCV medications for patients receiving HCV positive organs and how to manage drug-drug interactions when selecting antiviral treatments. As well as provide counseling upon initiation and checking for adherence to completion of treatment
- Pharmacist initiated research project presented at the American Transplant Congress Annual Meeting

*Awarded two research grants for one project*

*Developed process to guide antiviral treatment for patients receiving HCV positive organs*

- Continued to encourage post-transplant prescriptions be filled at the Duke Cancer Center Specialty Pharmacy generating significant organizational revenue

**Team Members**

Matt Harris, PharmD, MHS, BCPS	Director Transplant Pharmacy Programs
Jennifer Gommer, PharmD, BCPS	Inpatient Abdominal Transplant Clinical Pharmacist
Jennifer Byrns, PharmD, BCPS	Ambulatory Abdominal Transplant Clinical Pharmacist
Mara Watson, PharmD	Inpatient Heart Transplant Clinical Pharmacist
Holly Berry, PharmD, BCACP	Ambulatory Thoracic Transplant Clinical Pharmacist
Amanda Hulbert, PharmD, CPP, BCPS	Inpatient Medical Lung Transplant Clinical Pharmacist
Kristi Beermann, PharmD, BCPS	Inpatient Surgical Lung Transplant Clinical Pharmacist

## Transitions of Care Program

Lindsey Burgess



### Overview of services

Clinical pharmacists and certified pharmacy technicians are active participants in the various transitions of care that occur during their hospitalization at Duke University Hospital (DUH). The Continuity of Care Team complete admission medication histories for patients admitted to DUH in order to enhance medication safety during the admissions process. The team is comprised of nine full time nationally certified pharmacy technicians and six pharmacy students.

Services include:

- Participate in the pharmacy admissions process by completing medication history patient interviews and documentation in our electronic medical record utilizing Best Practice Medication History (BPMH) processes for patients in the Emergency Department and non-ICU floors at DUH
- Provide training and medication history education to University of North Carolina Eshelman School of Pharmacy students and students training in the DUHS Pharmacy Technology Training Program.
- Complete medication history patient interviews in the Perioperative Anesthesia & Surgical Screening (PASS) Clinics prior to provider appointments.

### Availability:

Inpatient services are available to all admitted non-ICU patients at Duke University Hospital. Continuity of Care team members are available Monday through Friday from 7:00am to 11:30pm and 7:00am to 3:30pm on weekends and Holidays.

### Major Accomplishments

- Standardizing medication history iVent documentation through enhanced use of smart phrases
- Expanded the PASS Clinic pharmacy technician services to include the Page Road location for a total of 3 pharmacy technicians in their clinics
- Focused services on patients at high risk of readmission by utilizing the Readmission Risk scoring tool in Maestro to prioritize patients for medication histories for patients receiving our Clinical Pharmacist Discharge Medication Reconciliation Review services on General Medicine and General Surgery.
- Developed a Continuity of Care training check list to ensure standardized onboarding and training education for all new employees
- Increased training of fourth year pharmacy students to assist with the pharmacy admission process in collaboration with the COC team and pharmacy preceptors
- Successfully increased the CoC team by 3.0 FTE with the goal of providing our services to a greater number of admitted patients including more high-risk patient populations.

*Focused medication history and discharge reconciliation services to patients at high risk of readmission*

### Our Team

- Transitions of Care Pharmacy Manager; Lindsey Burgess PharmD, BCPS, BCCP
- Continuity of Care Pharmacy Technicians
  - Eleven PCTB Nationally Certified Pharmacy Technicians (8 inpatient, 3 outpatient)
  - Five student pharmacists



## **VI. Research Program**

### **Pharmacy Research Committee**

#### **Purpose**

The Pharmacy Research Committee is a scientific advisory committee designed to enhance pharmacy staff, resident and student knowledge and participation in research.

#### **Committee Function**

The scope of the committee responsibilities shall include:

- Oversee, guide and facilitate research activities to include:
  - Study feasibility assessment
  - Compliance with Investigational Review Board requirements
  - Adherence to data security requirements via review of the Research Data Security Plan
  - Compliance with institutional training requirements
- Identify and arrange extra-departmental research support resources which may include:
  - Statistical consulting services
  - Clinical Research Unit /Institutional Review Board protocol review
  - Duke Office of Clinical Research (DOCR) review
- Issue a call for research project ideas on an annual basis and maintain a directory of interested research preceptors and their areas of research interests
- Establish guidelines/timelines for research projects
- Provide assistance to preceptors in developing suitable research projects
- Review and provide feedback to study investigators on Research Project Outlines and Research Protocols (including evaluation of scientific merit, design, feasibility, relevance to internal/external audiences, resources and regulatory compliance)
- Make recommendations to the Pharmacy Senior Management Group (SMG) regarding approval of projects
- Review and provide feedback on abstracts and presentations. Specific feedback shall be provided to pharmacy residents in preparation for the Vizient meeting and Southeastern Residency Conference (SERC)
- Perform an annual assessment of the effectiveness of the resident research process
- Assess pharmacy staff and residents' learning needs regarding necessary research skills and facilitate the scheduling of research training sessions to meet these needs and those required by the institution
- Ensure that investigators maintain a regulatory file, which may be held electronically. Contents of the files could include documents such as a project staff list and training updates, all IRB communications, protocol, and if applicable, consent templates.

#### **Membership**

Meredith T. Moorman, PharmD, BCOP, CPP - Chair  
Clinical Pharmacist, Adult Hematology/Oncology Clinic  
Duke University Hospital

Amanda M. Ball, PharmD, BCPS, BCCCP  
Clinical Manager, Clinical Patient Care Services  
Duke University Hospital

Jennifer Byrns, PharmD, BCPS  
Clinical Pharmacist, Ambulatory Abdominal Transplant  
Duke University Hospital

Monique Conway, PharmD, BCPS  
Clinical Pharmacist, Clinical Patient Care Services  
Duke University Hospital

April A. Cooper, PharmD  
Clinical Pharmacy Specialist, Internal Medicine  
Co-Director, PGY2 Internal Medicine Residency  
Clinical Assistant Professor- Campbell University College of Pharmacy & Health Sciences  
Duke Regional Hospital

Matt Harris, PharmD, MHSc, BCPS  
Director of Transplant Pharmacy Programs  
Clinical Pharmacist, Abdominal Transplant  
PGY2 Transplant Residency Program Director  
Duke University Hospital

Alana Lehman, PharmD, BCOP  
Clinical Pharmacist, Inpatient Hematology/Oncology  
Duke University Hospital

Samantha (Wang) Louis, PharmD, MPH, BCPS  
Clinical Pharmacist, Clinical Patient Care Services  
Duke University Hospital

Melissa Mackey, PharmD, BCPS, BCOP  
Clinical Pharmacist, Adult Hematology/Oncology  
Duke University Hospital

Beth McLendon-Arvik, PharmD  
Manager, Duke Investigational Drug Service and Investigational Chemotherapy Service  
Director, PGY1 Pharmacy Residency  
Duke University Hospital

Doug Raiff, PharmD, BCPS  
Clinical Pharmacist, Center for Medication Policy  
Duke University Hospital

Cathy Vaughan, PharmD  
Clinical Pharmacist, Center for Medication Policy  
Duke University Hospital

Yolanda Williams, PharmD, PhD  
Clinical Pharmacist, Population Health Management Office  
Duke University Hospital

Catherine Lewis Wentz, PharmD, CACP, BCPS  
Clinical Pharmacy Specialist, Internal Medicine  
Co-Director, PGY2 Internal Medicine Residency  
Clinical Assistant Professor - Campbell University College of Pharmacy & Health Sciences  
Duke Regional Hospital

## **VII. Educational Program**

### **Pharmacy Education Committee**

#### **Purpose**

To promote and support educational activities of the department of pharmacy

#### **Committee Function**

- To establish and maintain an education committee,
- To support the educational needs of department of pharmacy staff (including residency programs offered by Duke University Hospital) and learners from affiliated schools/colleges of pharmacy through sub-committees charged with specific responsibilities and accountabilities

#### **Subcommittees**

Subcommittees for the following areas will assume accountability and responsibility for assigned educational needs:

- Pharmacy Noon Conference
- Preceptor Development
- UNC ESOP Early Immersion Clerkships
- UNC ESOP Advanced Immersion Clerkships
- UNC ESOP Advanced Immersion Research
- Campbell University COP IPPE Student Clerkships
- Campbell University COP APPE Clerkship
- Pharmacy Internship Program
- Student Rotation Requests
- Teaching Certificate Program
- Technician Professional Development Committee
- Pharmacy Technology Training Program
- Willow/ Beacon Training

#### **Membership**

Paul Bush, PharmD, MBA, BCPS, FASHP  
Chief Pharmacy Officer  
Committee Chair

Aaron Will, PharmD, BCPS  
Associate Chief Pharmacy Officer – Clinical and Patient Care Services  
Committee Co-Chair

Jenny Mando-Vandrick, PharmD, BCPS  
Clinical Pharmacist – Emergency Services  
Chair – Pharmacy Noon Conference Subcommittee

Evan Frasure III, PharmD, BCPS  
Director, Controlled Substance Diversion Prevention  
Chair – Teaching Certificate Program

Sarah Kokosa  
Clinical Pharmacist, Adult Endocrine Clinic  
Chair – Preceptor Development Subcommittee

Kristen Bova Campbell, PharmD, BCPS, AQ-Cardiology, CPP  
Clinical Pharmacist - Cardiology  
Chair - UNC ESOP Advanced Immersion Clerkships

Ann McGee, PharmD  
Director, Center for Medication Policy  
Chair - UNC ESOP Advanced Immersion Research

Kevin Helmlinger, PharmD, BCPS  
Manager, Children's Hospital Pharmacy  
Chair – UNC ESOP Early Immersion Clerkships

Nicole Panosh, PharmD, MS, BCPS  
Associate Chief Pharmacy Officer – Women's and Children's Hospital and Health Center  
Chair – Campbell University COP IPPE Student Clerkships

Dustin Wilson, PharmD, BCPS  
Clinical Pharmacist – Medicine  
Assistant Professor, Campbell University College of Pharmacy and Health Sciences  
Chair – Campbell University COP APPE Student Clerkships

Jordan T. DeAngelis, PharmD, MS, BCPS  
PGY2 Health System Pharmacy Administration Resident  
Chair – Pharmacy Internship Program

Mathew Kelm, PharmD, MHA  
Associate Chief Pharmacy Officer, Inpatient Pharmacy Services  
Chair - Pharmacy Technology Training Program

Sean Kitson, B.S., CPhT  
Pharmacy Technician II, DukeWELL  
Chair – Technician Professional Development Committee

Austin Motteler, PharmD  
Clinical Pharmacist, Patient Care Technology Education  
Chair - Willow/ Beacon Training

## VIII. Residency Programs

For over 45 years, our program has been training residents to become exceptional pharmacy practitioners and leaders. Residents who complete our program have experienced success in obtaining competitive specialty residencies, fellowships, academic, clinical and pharmacy leadership positions.

A testament to their success is the exemplary institutions that which Duke Pharmacy residents begin their post-residency careers.

We extend our gratitude to our residency program directors:

- |                              |   |
|------------------------------|---|
| ▪ Beth McLendon-Arvik        | Post Graduate Year (PGY) 1*   |
| ▪ Paul W. Bush               | PGY1-2 Health-System Pharmacy Administration*   |
| ▪ Kimberly Hodulik           | PGY2 Ambulatory Care*   |
| ▪ Kristen B. Campbell        | PGY2 Cardiology*  |
| ▪ Bridgette Kram             | PGY2 Critical Care*   |
| ▪ Ann Scates-McGee           | Drug Information (with Glaxo Smith Kline)   |
| ▪ Jennifer Mando-Vandrick    | PGY2 Emergency Medicine*  |
| ▪ Richard Drew/Dustin Wilson | Internal Medicine/Infectious Diseases/Academia<br>(with Campbell University School of Pharmacy) |
| ▪ Sally Barbour              | PGY2 Oncology*  |
| ▪ Julia (Jill) Lawrence      | PGY2 Pediatrics*  |
| ▪ Matthew T. Harris          | PGY2 Solid Organ Transplantation*   |

\*ASHP-Accredited

### **2018-2019 Residency Graduates and Current Positions**

The 2018-2019 residents successfully completed all requirements for graduation from the Duke program. These graduates include:

#### **PGY1:**

Alana Ferrari	PGY2 Oncology Residency – Duke University Hospital
Kelsey Ohman	PGY2 Critical Care Residency – Duke University Hospital
Mackenzie Magid	PGY2 Solid Organ Transplant Residency – Duke University Hospital
Mark Vestal	PGY2 Emergency Medicine Residency – Duke University Hospital

#### **PGY2 Ambulatory Care:**

Jason Funaro	Clinical Pharmacist, Infectious Diseases Clinic – Duke University Hospital
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#### **PGY2 Cardiology:**

Jennifer Cook	Clinical Pharmacist– Duke University Hospital
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#### **PGY2 Critical Care:**

Arzo Hamidi	Clinical Pharmacist, Surgical Intensive Care Unit – Massachusetts General Hospital; Boston, MA
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#### **Drug Information:**

Elyse Prather	Pharmacy Program Coordinator, Policy and Education – University of Kentucky Healthcare; Lexington, KY
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**PGY2 Emergency Medicine:**

Marcus Kaplan Clinical Pharmacy Specialist, Emergency Department – Sentara Norfolk General Hospital; Norfolk, VA

**Internal Medicine/Infectious Diseases/Academia:**

David Laurent Clinical Pharmacist – Vidant Health

**PGY1-2 Health-System Pharmacy Administration/M.S.:**

Iliana Morataya (PGY1) PGY2 Health-System Pharmacy Administration Resident – Duke University Hospital

Jordan DeAngelis (PGY2) Coordinator, Procurement & Emergency Preparedness – Duke University Hospital

**PGY2 Oncology:**

Breanna Lee Clinical Pharmacist, Stem Cell Transplant – University of Miami Sylvester Comprehensive Cancer Center; Miami, FL

Heather Morris Pharmacy Operations Manager, Outpatient Infusion Centers – Bon Secours Mercy Health; Norfolk, VA

**PGY2 Pediatrics:**

Carson Tester Clinical Pharmacist, Pediatric Cardiac Stepdown Unit – Duke University Hospital

**Chief Resident:** Jordan T. DeAngelis  
**Preceptor of the Year:** Shawn Kram  
**Residency Advocate Award:** Jennifer Mando-Vandrick



**Duke University Hospital Pharmacy Residency Class of 2018-2019**  
(Residents and Program Directors Pictured)

The 2019-2020 recruiting campaign successfully filled 19 residency positions offered at Duke. Listed below are the current residents and their College of Pharmacy or previous PGY1 residency program:

**PGY1:**

Melanie Ayarza	University of North Carolina Eshelman School of Pharmacy
Sarah Burnette	University of Tennessee School of Pharmacy
Dena Evans	University of North Carolina Eshelman School of Pharmacy
Kristen Fischer	University of Kansas School of Pharmacy
Ashley Kamp	University of Pittsburgh School of Pharmacy
Riley Scalzo	Virginia Commonwealth University School of Pharmacy
Michael Scott	University of Missouri – Kansas City School of Pharmacy

**PGY2 Ambulatory Care:**

Erin Wei	PGY1 Pharmacy Residency – University of Washington
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**PGY2 Cardiology:**

Justin Joy	PGY1 Pharmacy Residency – Emory University Hospital
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**PGY2 Critical Care:**

Kelsey Ohman	PGY1 Pharmacy Residency – Duke University Hospital
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**Drug Information:**

Shivali Patel	PGY1 Pharmacy Residency – Massachusetts General Hospital
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**PGY2 Emergency Medicine:**

Mark Vestal	PGY1 Pharmacy Residency – Duke University Hospital
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**Internal Medicine/Infectious Diseases/Academia:**

Spencer Livengood	PGY1 Pharmacy Residency – Vidant Health
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**PGY1-2 Health-System Pharmacy Administration/M.S.:**

John Awad (PGY1)	University of Connecticut
Iliana Morataya (PGY2)	PGY1 Pharmacy Residency – Duke University Hospital

**PGY2 Oncology:**

Alana Ferrari	PGY1 Pharmacy Residency – Duke University Hospital
Jessica Lewis-Gonzalez	PGY1 Pharmacy Residency – University of New Mexico Hospitals in Albuquerque

**PGY2 Solid Organ Transplant:**

Mackenzie Magid	PGY1 Pharmacy Residency – Duke University Hospital
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**PGY2 Pediatrics:**

Katherine Greenhill	PGY1 Pharmacy Residency – Memorial Health University Medical Center
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**Chief Resident**

Iliana Morataya, PharmD



**Duke University Hospital Pharmacy Residency Class of 2019-2020**

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## **IX. Milton W. Skolaut Leadership Award**

### **Overview**

The Milton W. Skolaut Leadership Award is awarded to a past resident of the Duke University Hospital Pharmacy Residency Program. This award recognizes an individual for outstanding leadership and contributions to the profession of pharmacy.

### **About Milton W. Skolaut**

Milton W. Skolaut was born in San Antonio, Texas and earned a bachelor's degree in 1941 from the University of Texas College of Pharmacy. In 1952, Skolaut became Director of Pharmacy Services at the National Institutes of Health (NIH) Clinical Center in Bethesda, Maryland. While at the clinical center, Skolaut established the pharmacy as the central supply point for drug distribution, a relatively new concept at the time but one that quickly became the norm for hospitals nationwide.

Skolaut joined the staff of Duke Hospital in 1970, where he served for 17 years as Director of Pharmacy until his retirement in 1987. During Skolaut's tenure at Duke, the pharmacy established services that included the preparation of unit dose medication packages, intravenous admixtures, and total parenteral nutrient solutions. He was also responsible for the expansion of a pharmacy within the operating room suites, supplying all materials and





medications to the Anesthesia Department. The Department of Pharmacy also instituted clinical services and a residency program under his leadership.

Mr. Skolaut was an active member of ASHP for many years, including serving as president from 1963-64. In 1968, he was one of the three visionary leaders that started the ASHP Research and Education Foundation. In 1979, Skolaut earned hospital pharmacy's highest honor, ASHP's Harvey A. K. Whitney Lecture Award.

### **Past Recipients**

**2014:** Jill S. Bates, PharmD, MS, BCOP

**2015:** James C. McAllister III, MS, FASHP

**2016:** Elizabeth Dodds Ashley, PharmD, MHS, FCCP, BCPS

**2017:** Nancy Allen LaPointe, PharmD, MHS, AACC

**2018:** Stephen F. Eckel, PharmD, MHA, BCPS

### **2019 Recipient:**

**Richard H. Drew, PharmD, MS, FCCP, FIDP**



Dr. Drew is Professor of Pharmacy (Campbell University College of Pharmacy & Health Sciences (CUCPHS, Buies Creek, NC) and Medicine (Infectious Diseases, Duke University School of Medicine [DUSOM], Durham, NC). His current roles include Vice Chair for Research and Scholarship of Pharmacy Practice (CUCPHS), Medical Co-Director of the DUSOM's Infectious Diseases Clinical Research Support Office, Consultant Pharmacist for the Duke Antimicrobial Stewardship Outreach Network (DASON) and (for the past 20 years) Co-Director for the combined CUCPHS/Duke University Hospital PGY2 Pharmacy Residency in Internal Medicine/Infectious Diseases/Academia.

Dr. Drew received his B.S. in Pharmacy from the University of Rhode Island College of Pharmacy (1980) and both M.S. in Pharmacy (1989) and PharmD (1999) from the University of North Carolina at Chapel Hill. He has completed a PGY1 Residency in Hospital Pharmacy at Duke University Medical Center (1981) and the American Association of Colleges of Pharmacy (AACCP) Academic Research Scholars Fellowship (2015). Among his professional organization leadership roles included service as Chair of the NC Society of Hospital Pharmacist's Pharmacotherapy Advisory Special Interest Group and President of the Society of Infectious Diseases Pharmacists. Dr. Drew is a Fellow of the American College of Clinical Pharmacy (ACCP) and the Society of Infectious Diseases Pharmacists (SIDP).

He is the recipient of the 2008 CUCPHS Dean's Award for Research Excellence and the 2012 inaugural recipient of the Campbell University Russ Jr/Walter Jones Jr Award for Research Excellence. In 2018, Dr. Drew was nominated for the CUCPHS Educator of the Year Award. His practice, research, presentations and publications are focused in the areas of antifungal pharmacotherapy, aerosolized antibiotics, antibiotic decision support, antimicrobial stewardship and antibacterial drug resistance.

## **X. Preceptor Awards**

**Student Preceptor of the Year – Cody Carson, PharmD, BCPS**



Presented by: Drs. Paul Bush  
and Kristen Campbell

**Resident Preceptor of the Year – Shawn Kram, PharmD, BCPS, BCCCP**



Presented by: Chief Resident  
Dr. Jordan DeAngelis

**Resident Advocate of the Year – Jennifer Mando-Vandrick, PharmD, BCPS**



Presented by: Chief Resident  
Dr. Jordan DeAngelis

## **XI. Grants and Publications**

## **XI. Grants and Publications**

### **Publications:**

**Achey TS**, Riffle AR, Rose RM, Earl M. Development of an operational productivity tool within a cancer treatment center pharmacy. *Am J Health Syst Pharm*. 2018 Nov 1;75(21):1736-1741. doi: 10.2146/ajhp170367. Epub 2018 Oct 3.

Shearin S, **Bell T**. Treatment of *Aspergillus fumigatus* infection with posaconazole delayed-release tablets. *Am J Health Syst Pharm*. 2018 Jul 1;75(13):958-961. doi: 10.2146/ajhp170534.

DeZubay J, **Drew R**, Smith J, Mills EP, **Bell T**, Holland MA. Type 2 Diabetes Mellitus in Patients with a prior history of Corticosteroid-induced hyperglycemia. *Contemp Pharm Pract*. 2019; 66(1):35-40.

Durham ME, **Bush P**, **Ball AM**. Evidence of burnout in health-system pharmacists. *Am J Health Syst Pharm*. 2018;75(suppl 4):e801-808.

Szczepanik A, **Byrns J**, Sanoff, S, Jiang Y. Kidney Transplantation in a patient with MELAS: a case report and review of the literature on medication use. *Med Case Rep J*. 2018;1(113):1-6

**DeAngelis JT**, Wolcott MD. A job analysis to define the role of the pharmacy preceptor. *Am J Pharm Educ*. 2019;83(7):Article 7196

Ng TM, DiDomenico RJ, Ripley TL, Benge CD, Buckley LF, **Campbell KB**, Hale GM, Macaulay TE, Nappi JM, Pickworth KK, Short MR. An opinion paper of the Cardiology Practice and Research Network of the American College of Clinical Pharmacy: recommendations for training of cardiovascular pharmacy specialists in postgraduate year 2 residency programs. *J Am Coll Clin Pharmacy*. 2019. Doi: 10.1002/jac5.1148

Vijayaraman P, Chung MK, Dandamudi G, Upadhyay GA, Krishnan K, Crossley G, **Campbell KB**, Lee BK, Refaat MM, Saksena S, Fisher JD, Lakkireddy D. His Bundle Pacing. *J Am Coll Cardiol*. 2018;72:927-47.

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Fuller K, **Gregory P**, Liu B, Komives E, **Smith B**. Developing and evaluating a pharmacy technician home visit program. *Am J Health-Syst Pharm* 2019; 76(5): 263-64.

Miller AG, Haynes KE, Gates RM, Zimmerman KO, **Heath TS**, Bartlett KW, McLean HS, Rehder KJ. A Respiratory Therapist-Driven Asthma Pathway Reduced Hospital Length of Stay in the Pediatric Intensive Care Unit. *Respir Care*. 2019;64(11):1325-1332.

**Hodulik KL**, **Root AG**, Ledbetter LS, Onwuemene OA. Effects of therapeutic plasma exchange on anticoagulants in patients receiving therapeutic anticoagulation: a systematic review. *Transfusion*. 2019 May;59(5):1870-1879. doi: 10.1111/trf.15191. Epub 2019 Feb 14.

**Hulbert AL**, Pavlisko EN, Palmer SM. Current challenges and opportunities in the management of antibody-mediated rejection in lung transplantation. *Curr Opin Organ Transplant*. 2018 Jun;23(3):308-315. doi: 10.1097/MOT.0000000000000537.

**Kaplan MC, Heath TS.** Evaluation of Calcium Homeostasis and Dietary Supplementation for Pediatric and Neonatal Patients Receiving Extracorporeal Membrane Oxygenation Support. *J Pediatr Pharmacol Ther.* 2019;24(1):27-33.

**Kelm M, Campbell U.** Improved Arrangement and Capacity for Medication Transactions: A Pilot Study to Determine the Impact of New Technology on Medication Storage and Accessibility. *Hosp Pharm.* 2018 Oct;53(5):338-343. doi: 10.1177/0018578718757660. Epub 2018 Mar 8.

**Kram B, Trammel MA, Schultheis J, Kram S, Wheeley S, Mancheril B, Burgess LD.** Medication Histories in Critically Ill Patients Completed by Pharmacy Personnel. *Ann Pharmacother.* 2019; 53: 596-602.

Gunn AH, Smothers ZPW, Schramm-Sapyta N, Freiermuth CE, MacEachern M, **Muzyk AJ.** The Emergency Department as an Opportunity for Naloxone Distribution. *West J Emerg Med.* 2018 Nov;19(6):1036-1042. doi: 10.5811/westjem.2018.8.38829. Epub 2018 Sep 10.

**Muzyk A,** Mullan P, Andolsek KM, Derouin A, Smothers ZPW, Sanders C, Holmer S. An Interprofessional Substance Use Disorder Course to Improve Students' Educational Outcomes and Patients' Treatment Decisions. *Acad Med.* 2019 Nov;94(11):1792-1799. doi: 10.1097/ACM.0000000000002854.

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Dunn-Pirio AM, Woodring S, Lipp E, Herndon JE 2nd, Healy P, **Weant M,** et al. Adjunctive perampanel for glioma-associated epilepsy. *Epilepsy Behav Case Rep.* 2018 Oct 9;10:114-117. doi: 10.1016/j.ebcr.2018.09.003. eCollection 2018.

**Weant MP,** Jesús CM, Yerram P. Immunotherapy in Gliomas. *Semin Oncol Nurs.* 2018 Dec;34(5):501-512. doi: 10.1016/j.soncn.2018.10.011. Epub 2018 Nov 2.

Ghassemi E, Barnes C, Cisneros R, Fuller S, McLendon A, **Wilson D.** Impact of Social Media Use on Reading Levels in Third-Year Student Pharmacists. *Curr Pharm Teach Learn* 2019;11(9):915-919.

### **Interviews:**

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Peebles, Lynne. Battling Burnout: Nearly Two-Thirds of Pharmacists Say They're Vulnerable. *Pharmacy Practice News.* March 4, 2019 Publication from Interview (Amanda Ball).

Traynor, Kate. *Pharmacists Examine Risks, Remedies for Burnout.* *Am J Health Syst Pharm.* March 11, 2019 Publication from Interview (Amanda Ball).

Wild, David. Risks and Rewards on the Road To IV Automation. *Pharmacy Technology Report*. February 28, 2018. Publication from Interview (Jerry Usher).

**Grants:**

**Bell T.** Duke Outpatient Cystic Fibrosis Pharmacist Grant: From the CF Foundation to support the Pediatric Pharmacist in the CF clinic (2019-2022).



Duke University Hospital

