

# Pharmacy Department

Shaping the Future of Cancer Care



Memorial Sloan Kettering  
Cancer Center

## **Our Vision**

To be the world's leading authority on cancer.

## **Our Mission**

Ending cancer for life.

## **Our Core Values**

Respect for the individual.





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## PHARMACY DEPARTMENT

**The Pharmacy Department is an integral part of the patient-focused mission at MSK. We strive to optimize medication delivery, quality, and safety, and we achieve that through our commitment to finding the best people in the industry.**

### Overview

Memorial Sloan Kettering Cancer Center (MSK) is the nation's premier organization dedicated to the progressive control and cure of cancer through programs of patient care, research, and education. This has been our mission since 1884. The 21st century marks an era of continued expansion at our main campus on New York City's Upper East Side and at additional sites in New York City, in Westchester County, on Long Island, and in New Jersey. Now, even more people can benefit from the best cancer care.

The great benefit to our patients is just the beginning. For someone seeking an exemplary career in a progressive environment, we are the industry leaders. We are innovators, and we set the standard for excellence. We are in the league of organizations that have a profound, positive impact on the world. For MSK employees, that makes it all the more fulfilling, rewarding, and challenging.

Growth is key at MSK, and change is a constant. Each new day brings new ideas, from the creation of new human genome technologies to the modernization and expansion of our clinical facilities and research programs. But there's one thing that will never change at MSK: the commitment of the best people in the industry. The result? *U.S. News & World Report* has consistently ranked us a leader in cancer care. Our staff puts their minds to work for all people — from patients and their families to future generations. Everyone profits from our discoveries, our learning, and our healing.

MSK's great reputation could not be maintained without the contributions of the Pharmacy Department. The Pharmacy Department's practice model is based on a multidisciplinary team approach to patient care in all phases of development (pediatric, adult, and geriatric) with dedication and concern.



Scott Freeswick, PharmD, MS  
Vice President, Chief Pharmacy Officer

The professional staff, as well as the technical and support staff, perform with the highest regard for the patients they serve by assuring therapeutic efficacy and safety.

### Scope of Practice

The Pharmacy Department's scope of practice is consistent with the medication needs of the patients, as determined by the medical staff in accordance with MSK's Pharmacy and Therapeutics Committee. Written policies and procedures governing the safe dispensing of drugs and biologicals are developed and enforced in cooperation with the medical staff, the Division of Nursing, and other professionals as necessary. Electronic records are maintained for all transactions, as required by applicable law and Joint Commission standards, to maintain adequate control and accountability of all drugs.

The Pharmacy Department provides comprehensive clinical and dispensing services in both inpatient and ambulatory care settings through a decentralized satellite pharmacy services model. The department is responsible for providing pharmaceutical care to an average of 470 inpatients per day. The pharmacy reviews 1.5 million orders per year and dispenses more than 3.5 million doses per year. The role of the pharmacist at MSK continues to be broadened through successful implementation of innovative positions focusing on improving patient discharge and medication reconciliation.

The Pharmacy Department has over 600 employees and over 300 pharmacists serving patients through a decentralized pharmacy model that includes more than 28 pharmacy satellites.



## Pharmacy Satellites

**Central Pharmacy:** The central pharmacy provides the pharmacy satellites with medications by utilizing various state-of-the-art packaging and inventory management technologies.

**Hazardous and Nonhazardous Clean Room Satellite (R5):** Pharmacists in this area critically review, enter, mix, and dispense chemotherapy agents, narcotics, and other parenteral infusions for administration in an outpatient infusion center as well as on inpatient floors.

**OR Pharmacy:** Pharmacists in the operating room satellite provide comprehensive services to 21 OR suites, as well as to preoperative and postoperative care areas.

**Surgical Day Hospital (SDH):** SDH pharmacists are responsible for providing services to 16 OR suites dedicated to same-day surgery, as well as preoperative and postoperative care areas.

**Pediatric Ambulatory Care Center (PACC):** Pharmacists in the PACC work in both the R5 and PACC satellites. They play an integral role in providing chemotherapy treatments to pediatric patients visiting the outpatient clinic as well as those on the inpatient floors.

**Urgent Care Center (UCC):** Pharmacists in the UCC provide for our cancer patients who require emergent care or who are in the process of being admitted to the hospital.

**Research Pharmacy Lab:** Pharmacists with a PhD degree in pharmaceutical chemistry work a lab devoted to drug development. They help determine the compatibility and stability of drugs, contributing to the FDA approval of medications, and at the same time improve pharmacy operations.

The inpatient satellites are divided among the following services:

- M4** Neurology and Neurosurgery Service
- M5** Genitourinary Service
- M8** Bone Marrow Transplant Service
- M9** Pediatric Service
- M10** Gynecology and Breast Services
- M11** Intensive Care Unit
- M12** Leukemia Service
- M14** Lymphoma and Hematology Services
- M15** Medical and Surgical
- M16** Gastrointestinal Service
- M17** Head and Neck Service, Melanoma, and Sarcoma
- M18** Thoracic Surgery and Step-Down Surgery
- M19** Medical and Surgical

In addition to our Manhattan locations, we also have pharmacies at our outpatient treatment locations in New York City, in Westchester County, on Long Island, and in New Jersey.

## NEW YORK CITY OUTPATIENT FACILITIES



David H. Koch Center for Cancer Care at Memorial Sloan Kettering Cancer Center: Interior View

### New York City Outpatient Facilities

**The David H. Koch Center for Cancer Care** offers nearly every aspect of outpatient cancer care across many specialties, so most patients can get all their treatments in one place. The David H. Koch Center for Cancer Care has been designed to help restore patients' health and well-being, and offers chemotherapy, immunotherapy, radiation therapy, blood and marrow transplants, clinical trials, rehabilitation services, and much more.

**The Evelyn H. Lauder Breast Center** delivers pioneering, breast cancer care, all under one roof. Our team of breast cancer experts offers the most-advanced services in breast cancer prevention, diagnosis, and treatment, as well as a wide range of services to support patients through treatment. The MSK specialty pharmacy is also housed at this site.

**The Sidney Kimmel Center for Prostate and Urologic Cancers** is a state-of-the-art treatment center focused entirely on genitourinary cancers (tumors of the prostate, kidney, bladder, or testicle). Our multidisciplinary DMT are dedicated to providing patients with the most-effective care available today — from the initial detection and diagnosis of disease to progressive treatment, rehabilitation, and follow-up care.

**The Rockefeller Outpatient Pavilion (also called MSK 53rd Street)** offers outpatient radiology and chemotherapy services in a comfortable, supportive setting. This includes multidisciplinary physician practice suites and treatment spaces, which are organized by disease teams. Our outpatient clinics specialize in dermatology, gastrointestinal oncology, genitourinary oncology, gynecology, plastic and reconstructive surgery, thoracic oncology, and cardiology and pulmonary services. They also provides radiological services, including MRI, ultrasound, CT scans, mammography, bone densitometry, and general radiology.

This location also has a full service specialty pharmacy where highly experienced pharmacists can review and dispense virtually every commercially available oral chemotherapy medication.

**The Josie Robertson Surgery Center** sets a new standard for outpatient cancer surgery at Memorial Sloan Kettering, with a first-of-its-kind freestanding facility on Manhattan's Upper East Side. The operating rooms and care areas have been specifically designed for specialty procedures, which include surgery for breast cancer and reconstruction as well as head and neck, gynecologic, and urologic cancers.

**The Ralph Lauren Center** offers cancer prevention, diagnosis, treatment, and support services. Since its founding in 2003, the RLC has served the Harlem community and surrounding neighborhoods by providing high-quality diagnostic and treatment services in a warm, welcoming, and culturally sensitive environment.

### Outpatient Treatment Centers Outside of New York City

There are several outpatient regional sites dedicated to giving treatments to our patients who prefer to be cared for closer to home. The different areas are listed below:

**MSK Basking Ridge**

**MSK Bergen**

**MSK Monmouth**

**MSK Commack**

**MSK Nassau**

**MSK Hauppauge**

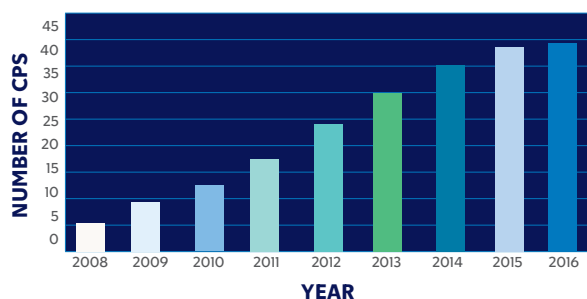
**MSK Westchester**



## CLINICAL SERVICES

### Overview

The clinical program began in 2007 with the Pharmacy Department's recognition of the need for advanced clinical training in oncology pharmacy practice. The program has successfully expanded from two adult clinical specialists to more than 40 specialists covering multiple Adult and Pediatric Services within Leukemia, Bone Marrow Transplant, Lymphoma, Multiple Myeloma, Thoracic, Neuro-oncology, and Phase I clinics. We also have Clinical Pharmacy Specialists (CPS) in ancillary services, such as infectious disease, geriatrics, and pain and palliative care. During the next three to five years, we are committed to continuing our expansion to support more solid tumor services, with the ultimate goal of providing fully integrated clinical pharmacists to all the inpatient and outpatient medical oncology services.



### Clinical Pharmacy Specialists

Clinical Pharmacy Specialists serve on the multidisciplinary team as experts in the therapeutic use of medications, and they act as liaisons between the Pharmacy Department and physicians, nurses, and other hospital personnel. Clinical Pharmacy Specialists are registered clinical pharmacists who assume primary responsibility and accountability for the provision of safe and effective medication therapy.

### Clinical Pharmacy Specialist Qualifications and Requirements

In addition to a doctorate of pharmacy (PharmD), clinical pharmacy specialists are required to complete two years of residency training and to obtain board certification in their applied specialty.

- Doctorate of Pharmacy (PharmD)
- Residency Training (two years)
  - PGY1: Pharmacy practice
  - PGY2: Oncology, pediatrics, infectious disease, or other as applicable
- Board Certification
  - Oncology, ambulatory care, or other as applicable



Richard Tizon, PharmD, BCOP  
Associate Director, Clinical Pharmacy Practice

### Clinical Interventions

Inpatient Clinical Pharmacy Specialists act as fully integrated members of the service team. Routine comprehensive inpatient care activities include:

- optimization of medication therapy
- design, implementation, and monitoring of patient-specific drug regimens
- the delivery of information and education to the medical service regarding safe medication use
- admission and discharge medication counseling

As on the inpatient services, clinical pharmacists have developed an essential role in the ambulatory clinics. Although dependent upon service-specific needs, the coordination of pharmacy services has been focused on clinic patients who meet the following criteria:

- new patient consultation
- chemotherapy education
- complex medication history
- protocol eligibility screening

### Collaborative Drug Therapy Management

In 2011, the New York State legislature approved a law granting limited prescribing rights to qualified pharmacists in collaboration with a physician. This law, titled Collaborative Drug Therapy Management (CDTM), allows for management of a patient's current medication therapies to optimize the physician's treatment plan and prevent medication errors. This includes renal dose adjustments, drug level monitoring, and discontinuing duplicate therapy. Clinical Pharmacy Specialists are granted CDTM privileges once credentialed by the medical board as associate members of the medical staff. CDTM also allows clinical pharmacists to participate in e-prescribing, as recently required by New York State law.

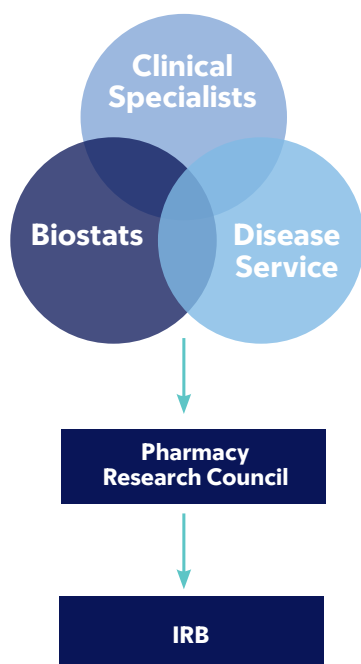
## RESEARCH DIVISION

### Overview

Research is a vital component of growth and development within the Pharmacy Department at MSK. Our goal is to provide relevant and robust contributions to the body of oncology literature with the aim to act as a source of expertise for oncology clinicians. Our team has been successful in speaking at national meetings and publishing original work in leading journals, such as the *Journal of Clinical Oncology* and *Bone Marrow Transplantation*. Clinical specialists are encouraged not only to conduct retrospective and prospective work as a primary investigator but also to collaborate with their colleagues in other disciplines.

### Collaboration

The Clinical Specialist's Disease Service is the most utilized resource for collaboration outside of the pharmacy Department. Additionally, the Center for Mechanism-Based Therapies is an institution-wide weekly seminar to discuss new scientific findings that lead to ideas for novel strategies for therapy and the implementation of the institution's research goals in early clinical trials. The Pharmacy Department also works with the Department of Biostatistics to provide statistical analysis on ongoing research. Collaboration within the department is essential as well; the Pharmacy Research Council is a pre-IRB committee in which clinical specialists review and approve protocols initiated by the Pharmacy Department as well as foster ideas for innovative research.



Stephen Harnicar, PharmD, BCOP  
Manager, Clinical Pharmacy Practice and Research

### Clinical Care

The Early Drug Development Service is a phase I clinic that specializes in taking care of patients enrolled in trials exploring novel therapies. These clinical specialists are at the front lines of oncology therapy, helping to ensure that there is a safe investigational drug process, assess drug dosing, and manage adverse drug reactions for these high-risk patients enrolled in phase I trials.

Clinical specialists are also in the unique position to collaborate with physician primary investigators and industry representatives to streamline the design, toxicity management, and drug interaction information of early drug trials.

### Areas of Research

Apart from service-oriented areas of research, such as supportive care, drug utilization, and financial analyses like cost-benefit or cost-effectiveness, we are in a unique situation to produce research for a specific patient population in which the principles of ADME can be complex. In partnership with research labs at Sloan Kettering Institute, trials with pharmacokinetic (PK) end points can be spearheaded by Pharmacy and analyzed using drug assays procured by the research labs. Also, our clinical specialists use pharmacokinetic software in order to facilitate trials with PK end points. By becoming leaders in pharmacokinetic trials, we hope to attract biotechnology companies in the interest of mutual benefit.



## RESEARCH

**Our Clinical Pharmacy Specialists are active researchers within their services. Below are examples of recent research abstracts.**



### Hematology

**Ryan J. Daley, PharmD, BCOP** worked with the Leukemia group to study pegaspargase use in acute lymphoblastic leukemia (ALL) patients  $\geq 40$  years of age. Given the favorable outcomes in the young adult and adolescent population, pegaspargase is now more commonly incorporated into chemotherapy regimens in adult patients up to age 39, however an upper age limit for safe administration of pegaspargase remains ill-defined, and the rates of toxicity to pegaspargase appear to increase with age.

The objective of Dr. Daley's study was to evaluate the tolerability and toxicity of pegaspargase in adult ALL patients  $\geq 40$  years of age, based on incidence and severity of adverse effects. Grade 3/4 asparaginase-related toxicities identified with  $\geq 10\%$  incidence included: hyperbilirubinemia, hyperglycemia, hypertriglyceridemia, hypoalbuminemia, hypofibrinogenemia, and transaminitis. 63% of patients (38 of 60) received all intended doses of pegaspargase, with the most common reasons for discontinuation noted as hypersensitivity (12%), hyperbilirubinemia/transaminitis (8%), and hematopoietic transplantation in complete remission (10%). Dr. Daley's study suggests that while hepatotoxicity and other known adverse effects are common, with careful monitoring and dose modifications, pegaspargase can safely be administered to adults with ALL age  $\geq 40$ .

### Novel Therapy

**Dazhi Liu, PharmD, BCOP** worked with the Early Drug Development service to study the on-target adverse events caused by TRK inhibitor therapy. The TRK pathway controls appetite, balance, and pain sensitivity. While these functions are reflected in the on-target adverse effects (AEs) observed with TRK inhibition, these AEs remain under-recognized, and pain upon drug withdrawal has not previously been reported. As TRK inhibitors are approved by multiple regulatory agencies for TRK or ROS1 fusion-positive cancers, the goal of Dr. Liu's study was to characterize these AEs and corresponding management strategies.

Ninety-six patients with 15 unique cancer histologies who received a TRK inhibitor were identified. Weight gain was observed in 53% of patients and increased with time on TRK inhibition. Pharmacologic intervention, most commonly with GLP-1 analogs or metformin, appeared to result in stabilization or loss of weight. Dizziness, with or without ataxia, was observed in 41% of patients. TRK inhibitor dose reduction was the most effective intervention for dizziness. Pain upon temporary or permanent TRK inhibitor discontinuation was observed in 35% of patients; this was more common with longer TRK inhibitor use. TRK inhibitor re-initiation was the most effective intervention for withdrawal pain. Dr. Liu's research describes the unique safety profile of TRK inhibitors relative to other anticancer therapies and warrants careful monitoring. These on-target toxicities are manageable with pharmacologic intervention and dose modification.



## Research Education Initiatives

MSK's Clinical Pharmacy Specialists are experts in what they do and therefore have the opportunity to teach research pharmacotherapy principles to new protocol investigators.

Conducting safe, high-quality clinical research necessitates accounting for on- and off-target drug effects and how drugs reach those targets across a diverse cohort. Principal investigators must apply crucial pharmacotherapeutic concepts when designing clinical cancer research to ensure protocols direct efforts to manage intra- and inter-patient differences in drug exposure and maximize safety.

We teach pharmacotherapy principles in two different courses:

- Master's program in Clinical and Translation Cancer Research
  - Pharmacokinetics & Drug Transporters
  - Pharmacodynamic Considerations
  - Pharmacogenomics & Drug Interactions
  - Pharmacotherapy Principles in Special Populations
- PhD program in Cancer Engineering
  - Pharmacokinetics & Drug Transporters
  - Pharmacodynamic Considerations & Drug Delivery
  - Pharmacogenomics
  - Drug Development from Bench to Bedside



## ADULT ONCOLOGY RESIDENCY PROGRAM

The PGY2 Adult Oncology Residency Program provides advanced training in clinical therapeutics for the adult cancer patient with the end goal of developing and building the knowledge and clinical skills required for each resident to practice independently.



Lisa Modelevsky, PharmD, BCOP  
Manager, Adult Clinical Pharmacy Practice  
Oncology Residency Program Director

### Program Overview

Our ASHP accredited oncology specialty residency focuses on the development of clinical skills in oncology pharmacy practice. The main objective of this training program is to develop problem-solving skills in cancer therapy and to establish a firm knowledge base in cancer diseases and treatment options, as well as antineoplastic pharmacology and pharmacokinetics. The rotations are designed to increase the resident's depth of clinical knowledge and expertise in oncology medication therapy management. These include medical oncology, hematologic malignancies, bone marrow transplant, pain management, pediatrics, and investigational drug management. The resident's interests and educational goals are incorporated into the curriculum design. In addition, residents will become familiar with supportive care management in cancer patients, including anemia and neutropenia management, anti-emetics, pain management, and nutrition.

### Who's Who

**Residency Program Director (RPD):** The RPD oversees the entire adult oncology residency program. The RPD works with residents to develop a customized residency plan and schedule to ensure that residents are on track to accomplish the goals and objectives outlined for the year, and to facilitate residents' overall progress throughout the program.

**Residency Program Coordinator (RPC):** The RPC works with the RPD to support the residency program. RPC responsibilities include ongoing feedback for the resident's educational lectures, oncology didactic lecture coordination, and assistance with residency recruitment and interviewing.

**Preceptors:** Each rotation has a pharmacy preceptor who guides the resident's learning experiences in order to meet the program goals and objectives while considering the resident's interests and skills. Actionable feedback is provided by preceptors throughout rotation and experiences are tailored to meet the needs of the resident. At the end of the rotation, the resident will meet with the preceptor to summarize lessons learned. A sign-out to the next rotation occurs once the final evaluation is complete.

A report assessing each resident is prepared based on the ASHP Oncology Residency Learning Objectives. PharmAcademic is used to document evaluations.

**Research Project Advisor:** The research project advisor for each resident has the primary responsibility of guiding the resident through their required research projects. The advisor assists the residents in selecting and defining the scope of each project to ensure appropriate design, adequate planning, timely completion, and thoughtful implementation. Residents are required to present the results of their projects at the Hematology/Oncology Pharmacy Association annual meeting. The resident and research project advisor are supported by the Residency Research Subcommittee.

**Resident Mentor:** Each resident is matched with a mentor to guide them throughout the residency and provide professional support and advice.



## Residency Program Learning and Teaching Opportunities

Several learning opportunities are available in addition to the residents' rotational experiences. These activities help to enrich the residents' training experience as well as offer teaching opportunities throughout the year.

### Journal Club

The pharmacy residents are responsible for scheduling, designing, and coordinating the journal club meetings. The main objective of the journal club is to expand residents' knowledge of how to critique a journal article, considering both the clinical and the statistical points of view. Residents are required to prepare two journal club presentations per year.

### Pharmacy Department Newsletter

Residents contribute to the newsletter as authors and editors. The newsletter provides the pharmacy staff with up-to-date clinical and departmental news, including formulary additions and deletions, new oncologic discoveries (treatment or disease related), announcements of new employees, and Joint Commission updates.

### Clinical Presentations

Clinical presentations are designed to discuss new clinical topics and patient-related cases with pharmacy staff. These presentations involve patients currently being treated at MSK. The meetings are organized in a way that allows pharmacists to participate in the discussion. In addition to case presentations, residents will present didactic lectures and participate in a structured debate with a co-resident.

### Continuing Education Presentation

The Pharmacy Department is an approved ACPE provider and offers monthly continuing education (CE) programs for pharmacists and technicians. Each resident is required to provide one CE presentation (one contact hour) to the pharmacy staff during the residency year.

## Oncology Didactic Lectures

These are biweekly lectures during the residency year that play a major role in the oncology residency. The goal of these didactic lectures is to enhance residents' knowledge of antineoplastic agents and the treatment of various cancer diseases. These meetings are limited to the residents and one or two clinical preceptors who facilitate these sessions. It is expected that residents research the topic assigned prior to the discussion. The oncology didactic lectures serve as a review for board certification after residency training is complete.

### Pharmacy Operations

Residents are expected to staff one weekend and two evening shifts per month. Additionally, there is a week of half-day staffing required during the month of December. Staffing helps residents develop professional practice, dispensing, and distribution skills. This experience provides residents with a full understanding of the medication use process, with enhanced focus on safely dispensing antineoplastic medications.

## Application Process for the Oncology Residency Program

Interested candidates should submit the following through Pharmacy Online Residency Centralized Application (PhORCAS):

- Letter of interest explaining career goals
- Three letters of recommendation (standard PhORCAS format)
- Academic transcript
- Curriculum vitae

**For information regarding the application process please contact the residency program director:**

### Lisa Modelevsky, PharmD, BCOP

Manager, Adult Clinical Pharmacy Practice  
Adult Oncology Residency Program Director  
Phone: 646-888-6602  
Email: modelevl@mskcc.org

## PEDIATRIC ONCOLOGY RESIDENCY PROGRAM

**MSK's PGY2 in pediatric oncology strives to work with each resident to establish a firm knowledge base in pediatric cancer conditions and treatment options, and to develop the skills to optimize outcomes through evidence-based, patient-centered medication therapy as an integral member of an interdisciplinary team.**



Jennifer Thackray, PharmD, BCPS, BCPPS  
Manager, Pediatric Clinical Pharmacy Practice  
Pediatric Oncology Residency Program Director

### Program Overview

Our Pediatric Oncology Specialty Residency focuses on the development of clinical skills in pediatric oncology pharmacy practice. The main objective of this training program is to develop problem solving skills in cancer therapy and to establish a firm knowledge base in pediatric cancer diseases and treatment options, as well as antineoplastic pharmacology and pharmacokinetics. The learning experiences available will broaden the resident's clinical skills and knowledge base in pediatric oncology. These include Pediatric Solid Malignancies, Pediatric Hematologic Malignancies, Pediatric Bone Marrow Transplant, Infectious Diseases, and Investigational Drug Management. In addition, residents will become familiar with supportive care management in cancer patients, including neutropenia management, anti-emetics, and pain management. Elective rotations are designed to meet the interests of the residents.

### Who's Who

**Residency Program Director (RPD):** The RPD oversees the entire Pediatric Oncology Residency Program. The RPD works with the resident to develop a customized residency plan and schedule, ensures that the resident is on track to accomplish the goals and objectives outlined for the year, and facilitates the resident's overall progress throughout the program.

**Residency Program Coordinator (RPC):** The RPC works with the RPD to support the residency program. RPC responsibilities include ongoing feedback for the resident's educational lectures, oncology didactic lecture coordination, and assistance with residency recruitment and interviewing.

**Preceptors:** Each rotation has a pharmacy preceptor who guides the resident's learning experiences in order to meet the program goals while considering the resident's interests and skills. In the middle of the rotation, the resident and preceptor review the resident's performance, at which time the rotation can be further customized to their needs. At the end of each rotation, the resident will meet with the preceptor to assess the resident's progress throughout the month in achieving the goals and objectives outlined for the rotation. Residents will be formally evaluated by their preceptor at the end of each rotation based on the ASHP Oncology Residency Learning Objectives. PharmAcademic will be used to document evaluations.

**Research Project Advisor:** The research project advisor for each resident has the primary responsibility for guiding them through their required research project. The advisor assists the resident in selecting and defining the scope of each project to assure appropriate design, adequate planning, timely completion, and thoughtful implementation. The resident is required to present the results of their project at the Hematology Oncology Pharmacy Association (HOPA) annual meeting. The resident and research project advisor are supported by the residency research subcommittee.

### Residency Program Learning/Teaching Opportunities

Several learning opportunities are available in addition to the resident's rotational experiences. These activities help to enrich the resident's training experience as well as offer teaching opportunities throughout the year.

## Journal Club

The pharmacy residents are responsible for scheduling, designing, and coordinating the journal club meetings. The main objective of the journal club is to expand the resident's knowledge of how to critique a journal article considering both the clinical and the statistical points of view. The resident is required to prepare two journal club presentations per year.

## Pharmacy Department Newsletter

The resident will contribute to the newsletter as an author and editor. The newsletter provides the pharmacy staff with up-to-date clinical and departmental news, including formulary additions/deletions, new oncologic discoveries (treatment or disease related), announcements of new employees, and Joint Commission updates.

## Clinical Presentations

The Clinical presentations meetings are designed to discuss new clinical topics as well as patient-related cases with pharmacy staff. These presentations involve patients currently treated at MSK. The meetings are organized in a way to allow the pharmacists to participate in the discussion. These clinical presentations can cover a broad range of topics from supportive care issues to disease state presentations, and the topics are not limited to oncology. The resident will be required to present five per year. In addition to clinical presentations, residents will also participate in a structured debate with a co-resident.

## Continuing Education Presentation

The pharmacy department is an approved ACPE provider and offers monthly continuing education (CE) programs for pharmacists. Each resident will be required to provide one CE presentation (one contact hour) during the residency year.

## Oncology Didactic Lectures

These are weekly lectures that play a major role in the oncology residency. The goal of these didactic lectures is to enhance the resident's knowledge of antineoplastic agents and the treatment of various cancer diseases. These meetings will be limited to the residents and one or two clinical preceptors who facilitate these sessions. It is expected that the resident researches the topic assigned prior to the discussion. The oncology didactic lectures serve as a review for board certification after residency training is complete.



## Pharmacy Operations

Residents are expected to staff one weekend and two evening shifts shift per month. Additionally, there is a week of half-day staffing required during the month of December. Staffing helps residents develop professional practice skills as well as dispensing/distribution skills. This experience will provide the resident with a full understanding of the medication use process with enhanced focus on safely dispensing antineoplastic medications. The resident is expected to practice as a pharmacist in a designated area throughout the residency year. The resident will also participate in clinical responsibilities as a part of our weekend on-call program during staffing.

## Application Process for the Pediatric Oncology Residency Program

Interested candidates should submit the following through Pharmacy Online Residency Centralized Application (PhORCAS):

- Letter of interest explaining career goals
- Three letters of recommendation (standard PhORCAS format)
- Academic transcript
- Curriculum vitae

**For information regarding the application process please contact the residency program director:**

### Jennifer Thackray, PharmD, BCPS, BCPPS

Manager, Pediatric Clinical Pharmacy Services  
PGY2 Oncology (Pediatrics) Residency Program Director  
Memorial Sloan Kettering (MSK) Kids  
646-888-6601  
thackraj@mskcc.org



## INFECTIOUS DISEASES RESIDENCY PROGRAM

**MSK's PGY2 in Infectious diseases (ID) helps the resident become a confident ID pharmacy specialist and antimicrobial steward with an additional focus on immunocompromised patients. The resident will be an integral member of an interdisciplinary health care team and collaborate with multiple disciplines on antimicrobial stewardship projects, guideline development and education.**

### Program Overview

Infectious diseases pharmacy residency program at MSK provides the resident training in antimicrobial pharmacotherapy for a variety of medical and surgical patients, both adult and pediatric, in mostly the inpatient setting with some outpatient experiences. The antimicrobial stewardship component would allow opportunity to improve leadership skills and collaborate with multiple disciplines on quality improvement projects, guideline development and implementation as well as education. Infections in immunocompromised patients are a particular strength of the training at MSK.

Longitudinal involvement with the Antimicrobial Subcommittee of the Pharmacy and Therapeutics Committee and completion of a research project are required. The program will provide the resident with a broad range of clinical and research opportunities, allowing flexibility to accommodate the professional goals of the resident. After completing this residency, the resident will have gained the knowledge and experience to be a competent Infectious Diseases Pharmacy Practitioner.

### Who's Who

**Residency Program Director (RPD):** The RPD oversees the Infectious Diseases residency program structure, quality and facilitates the resident's development throughout the year.

**Residency Program Coordinator:** Works with the residency program director to assure the training schedules are maintained, and preceptorship and evaluations for each rotation are provided routinely based on established learning objectives.



Additionally, the Residency Program Coordinator assures the proper documentation of resident activities.

**Preceptors:** Each rotation has a pharmacy preceptor who guides the resident and develops objectives and experiences to suit the residents needs and individual goals. Formal meetings with preceptors will be conducted prior to, midpoint and at the end of each rotation. Residents will be evaluated by their preceptor at the end of each rotation based on the ASHP Residency Learning Objectives. PharmAcademic will be used to document evaluations.

**Research Project Advisor:** The research project advisor has the primary responsibility to guide the resident through their required research project. Advisor will assist in selection, design, obtaining approval and best data collection and analysis strategies as well as manuscript revision. The resident is required to present the results of their research at a national meeting (ASM Microbe, ASHP, IDSA) and have the manuscript prepared for publication.

### Residency Program Teaching Opportunities

Teaching opportunities are available throughout the year. MSK is a site for pharmacy students on their advanced clinical rotations and the resident will be working side by side with the Infectious Diseases fellows. Antimicrobial Stewardship education and training is also an integral part of our program.



### Journal Club

The pharmacy residents are responsible for scheduling, designing, and coordinating the bimonthly journal club meetings. The objective of the journal club is to review recent publications and to critique a journal article including study design, statistical analysis and applicability of the results. The resident is required to prepare 1 journal club.

### Pharmacy Department Newsletter

The resident will contribute to the newsletter as an author and editor. The newsletter provides the pharmacy staff with up-to-date clinical and departmental news, including formulary additions/deletions, new oncologic discoveries (treatment or disease related), announcements of new employees, and Joint Commission updates.

### Continuing Education Presentation

The pharmacy department is an approved ACPE provider and offers monthly continuing education (CE) programs for pharmacists. Each resident will be required to provide one CE presentation (one contact hour) during his or her residency.

### Weekend Coverage

The resident is expected to work one weekend per month beginning in September. The weekend coverage will help the resident gain experience working independently. Duties include ASP approval requests and follow-ups, and rounds with the infectious disease service.

### Application Process for the Infectious Disease Residency Program

Interested candidates should submit the following through Pharmacy Online Residency Centralized Application (PhORCAS):

- Letter of intent explaining career goals and interests
- Three letters of recommendation (standard PhORCAS format)
- Academic transcript
- Curriculum vitae

**For information regarding the application process please contact the residency program director:**

#### **Nina Cohen Orsini, PharmD, BCPS, BCIDP**

Clinical Pharmacy Specialist Infectious Diseases  
Infectious Diseases Residency Program Director  
1275 York Avenue, New York, NY 10065  
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## MEDICATION-USE SAFETY AND POLICY RESIDENCY PROGRAM

The resident will be prepared to assume a leadership position as a medication safety officer, implement sustained medication use and quality improvement strategies in adult and pediatric patients, manage medication use guidelines and policies, and oversee regulatory and accreditation compliance.



Amelia Chan, PharmD, MBA, MS, BCOP  
Assistant Director, Drug Policy Management, Quality & Safety  
Medication-Use Safety and Policy PGY-2 Residency Program Director

### Program Overview

Memorial Sloan Kettering is pleased to offer a 12-month postgraduate training program that provides advanced training in medication use and quality assessment. The selected candidate will focus on the evaluation and assessment of high-alert medications including cancer chemotherapy, opioid infusions, anticoagulants, insulin, sedative infusions, and hypertonic electrolytes.

The resident will use our fully integrated electronic medical record and a library of comprehensive drug guidelines for virtually all medications that are used in patients with cancer. The resident will also utilize our robust electronic reporting system to dissect actual events and trend improvement efforts that enhance the care of our patients. The resident will interact with our experienced pharmacy staff, clinical pharmacy specialists, pharmacy leadership, medical and nursing leadership, Department of Quality & Safety, and Informatics and Technology Team. The resident will also learn about the medication use challenges in one of the largest investigational drug programs in the world with an NCI-supported research pharmacy. The resident will attend several interdisciplinary institutional committees including Pharmacy and Therapeutics, Pharmacy Quality Assessment, and Medication Management.

#### Required Educational Rotations include:

- Medication Safety Leadership
- Medication Event Evaluation and analysis
- Drug Policy I & II
- Transitions of Care
- Material Management
- Clinical including Pain management, Pediatric Oncology, Geriatrics, and Critical Care Services

### Who's Who

**Program Director:** The residency director oversees the entire Medication-Use Safety and Policy Residency Program. The director works with the resident to develop a customized residency plan and schedule, ensures that the resident is on track to accomplish the goals and objectives outlined for the year, and facilitates the resident's overall progress throughout the program.

**Residency Program Coordinator (RPC):** The RPC works with the RPD to support the residency program. RPC responsibilities include ongoing coordination for the resident's educational lectures and assistance with residency recruitment and interviewing.

**Preceptors:** Each rotation has a pharmacy preceptor who guides the resident's learning experiences in order to meet the program goals while considering the resident's goals, interests, and skills. In the middle of the rotation, the resident and preceptor review the resident's performance, at which time the rotation can be further customized to his or her needs. At the end of the rotation, the resident will meet with the preceptor to summarize lessons learned. A computerized report assessing each resident is prepared based on the (ASHP) Oncology Residency Learning Objectives. PharmAcademics is used to document evaluations.

**Project Advisor:** The project advisor for each resident has the primary responsibility for guiding him or her through their required research projects. The advisor assists residents in selecting and defining the scope of each project to assure appropriate design, adequate planning, timely completion, and thoughtful implementation. Residents are required to present the results of the projects at the Hematology Oncology Pharmacy Association (HOPA) annual meeting or at the Medication Safety Corroborative session at the ASHP Summer Meeting.



## Residency Program Learning/Teaching Opportunities

Several opportunities are available. Below is a summary of all the activities that will enrich learning as well as offer periodic teaching experiences.

### Pharmacy Operations

The resident is expected to staff approximately 250 hours throughout the year and become a proficient pharmacist. Staffing helps the resident develop professional practice skills as well as dispensing/distribution skills. This experience will provide the resident with a full understanding of the medication use process with enhanced focus on safely dispensing antineoplastic medications and all high-alert medications used at MSK. The resident is expected to practice as a pharmacist in a designated area throughout the residency year.

### Rotation at ISMP

The resident will train for 4 weeks with the Institute of Safe Medication Practices (ISMP).

### Committee Participation

The resident will track and trend medication events and adverse drug reactions (ADR) reports throughout the year and present reports to an interdisciplinary Pharmacy QA committee. The resident will also attend and participate in monthly Pharmacy and Therapeutics Committee meetings.

### Pharmacy Department Newsletter

The resident will contribute to the newsletter as author and editor. The newsletter provides the pharmacy staff with up-to-date medication-safety information and departmental news, announcements of new employees, and Joint Commission updates.

## Journal Club

The pharmacy residents are responsible for scheduling, designing, and coordinating the quarterly journal club meetings. The main objective of the journal club is to expand the resident's knowledge of how to critique a journal article considering both the clinical and the statistical points of view. The resident is required to prepare four journal club presentations per year.

## Continuing Education Presentation

The pharmacy department is an approved ACPE provider and offers monthly continuing education (CE) programs for pharmacists. Each resident will be required to provide one CE presentation (one contact hour) during his or her residency.

## Application Process for the Medication-Use Safety and Policy Program

Interested candidates should submit the following through Pharmacy Online Residency Centralized Application (PhORCAS):

- Letter of interest explaining career goals
- Three letters of recommendation (standard PhORCAS format)
- Academic transcript
- Curriculum vitae

**For information regarding the application process please contact the residency program director:**

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## FREQUENTLY ASKED QUESTIONS



### When did the residency programs start?

**Adult:** The Pharmacy Department recognized the value and need for an oncology specialty residency for pharmacists seeking a career in oncology practice and started the oncology residency program in July 2007.

**Pediatric:** Understanding the specific needs of the pediatric patient population and the unique training opportunity available within the pediatric department at Memorial Sloan Kettering, the Pharmacy Department developed a residency program with focused training in pediatric oncology. The pediatric residency program enrolled the first class of residents in July 2011.

**Infectious Diseases:** Infectious Diseases residency program at Memorial Sloan Kettering began in 2018. Clinical pharmacy specialists presence in infectious disease and stewardship has been long standing. Research opportunities focus in the areas of Infectious Diseases and antimicrobial stewardship in immunocompromised hosts.

**Medication-Use Safety and Policy:** Medication-Use Safety and Policy PGY-2 Residency Program Director began in July 2016.

### How many residents will be accepted?

The programs at MSK are designed to accept two to four adult oncology residents, one to two pediatric oncology residents, one medication-use safety and policy resident, and one infectious diseases resident.

### Are the residencies accredited by ASHP?

**Adults:** The ASHP surveyors conducted the initial program survey in April 2008. The ASHP Commission on Credentialing granted our program full accreditation. In 2017 the program completed a re-accreditation survey and the ASHP Commission on Credentialing granted the program full accreditation status for 8 years.

**Pediatric:** Our PGY2 Oncology Residency with a focus in pediatric oncology was initially surveyed by ASHP in June 2012. The ASHP Commission on Credentialing granted our program full accreditation. In 2017 the program completed a re-accreditation survey and the ASHP Commission on Credentialing granted the program full accreditation status for 8 years.

**Infectious Diseases:** The Infectious Diseases PGY-2 Residency program received full 8 year accreditation by the ASHP Commission on credentialing in 2020.

**Medication-Use Safety and Policy:** The program is accredited.

### What rotations are required in each residency program?

**Adult:** Two to 4 week core experiences are required in Bone Marrow Transplant, Leukemia, Lymphoma, Gastrointestinal, Breast, Gynecology, Thoracic, Genitourinary, Early Drug Development, Neuro-Oncology, Infectious Diseases, Cellular Therapy, and Investigational Drug Services.

**Pediatric:** Hematology/Oncology & Transplant and Cellular Therapy (TCT), and Adult Leukemia. Outpatient Rotations: TCT, Hematologic Malignancies, Neuro-Oncology, Neuroblastoma, Sarcoma.

**Infectious Diseases:** ID Consult Services include: Solid Tumor/Lymphoma, Leukemia/Bone Marrow Transplant. Other core rotations include Intensive Care, Antimicrobial Stewardship and Infection Control.

**Medication-Use Safety and Policy:** Infectious Diseases clinic is longitudinal rotation and the resident is scheduled to once a week afternoon clinic. It provides the resident with experience in management of long term treatment and follow up of bacterial, mycobacterial, fungal, viral and HIV infections, as well as prevention of infections and vaccinations of travelers and stem cell transplant recipients. In addition the resident will complete an outside ambulatory care one month rotation in the HIV and hepatitis clinic.

### What elective rotations are available?

Many opportunities are available. The rotations will be tailored to meet the goals and interests of the individual resident.

### What ambulatory care clinics are available?

**Adult:** There are opportunities in Breast, Gynecologic, Thoracic, Gastrointestinal, Leukemia, Lymphoma, Early Drug Development, and BMT clinics. Each can be designed to meet the resident's interests.

**Pediatric:** There are opportunities in Transplant and Cellular Therapy, Hematologic Malignancies, Neuro-Oncology, Sarcoma and Neuroblastoma clinics.

**Infectious Diseases:** Infectious Diseases clinic is longitudinal rotation and the resident is scheduled to once a week afternoon clinic. It provides the resident with experience in management of long term treatment and follow up of bacterial, mycobacterial, fungal, viral and HIV infections, as well as prevention of infections and vaccinations of travelers and stem cell transplant recipients. In addition the resident will complete an outside ambulatory care one month rotation in the HIV and hepatitis clinic.

### What teaching opportunities are there for residents?

The resident may have the opportunity to teach and mentor students, but limited to no more than one student per month. The residents have many opportunities to teach through planned teaching experiences such as Case Presentations, Journal Clubs, and Oncology Didactic Lectures.

Additionally, our PGY2 Oncology Residents have the opportunity to teach both a didactic lecture and/or a case recitation session at the Ernest Mario School of Pharmacy at Rutgers, The State University of New Jersey. This is an optional teaching opportunity for residents interested in academia.

### What are the other components of the residency?

In addition to daily clinical responsibilities during rotations, the oncology residents are required to discuss various topics in oncology with their preceptors on a daily basis. One ACPE-accredited CE program presentation to the entire pharmacy department is required from each resident. Residents are also responsible for publication of the monthly departmental newsletter. In addition, a major research project is a required component of the residency program. The resident is encouraged to develop his or her own research ideas, however a list of options based on current department needs and research goals can be provided at the start of the residency year. Pharmacy operations is an integral part of the residency program and requires all residents to staff at least one weekend per month.

### What are the benefits?

The residents will each be provided with office space, a telephone, a computer terminal, and full privileges at the Memorial Library.

Fully funded meeting attendance at:

- American Society of Health-System Pharmacist (ASHP) Midyear Clinical meeting.
- Hematology Oncology Pharmacy Association (HOPA) meeting.

The resident will be compensated with an annual salary of \$65,000 with an additional housing allowance of \$13,300. Additionally, a comprehensive benefits package is provided which includes medical/dental insurance and 15 paid days off during the year.

Hospital housing is available for residents. Amenities include a doorman, elevator building with on-site laundry.





## Contacts

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For more residency information please visit our website:

<https://www.mskcc.org/hcp-education-training/pharmacy-pgy-2-residencies>



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