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INTRODUCTION

Oncology pharmacy is a specialty practice that requires a range of expertise. Over the past two decades, the landscape of oncology pharmacy has undergone a dramatic transformation. Advancements in targeted therapies, immuno-oncology agents, and cell and gene therapies have fundamentally altered the complexity and scope of pharmaceutical care in cancer treatment.[1] Simultaneously, the volume of patients has increased substantially due to improved screening programs, earlier detection methods, an aging population at higher risk for cancer, and enhanced survival rates across multiple cancer types. These convergent trends have created unprecedented demands on oncology pharmacy services and have led to new and exciting roles.

Oncology pharmacist providers (OPPs) are licensed independent practitioners who design, implement, and adjust anticancer treatments. OPPs treat a wide range of malignancies, including solid tumors (eg, breast, lung, colorectal) and hematologic cancers (eg, leukemia, lymphoma, multiple myeloma), each requiring tailored pharmacologic protocols and toxicity management strategies to manage both disease-specific and patient-specific factors.[2] Oncology pharmacists are highly trained to prevent, manage, and identify complications associated with cancer and its treatment as part of team-based care.[3] Their expertise also allows them to support patients across the care continuum of general medicine, infectious disease, palliative care, and to support patients during active treatment, palliative care, and survivorship.

In addition to delivering traditional clinical care, OPPs play a broader role in supporting oncology patients across multiple aspects of care. OPPs contribute to prevention measures through immunization, lifestyle counseling, and screening recommendations. During survivorship, they actively manage long-term health issues, such as late toxicities and treatment-associated secondary malignancies. By focusing on health maintenance and quality of life improvements, they ensure ongoing disease management across the patient care continuum.[3] Additionally, OPPs are also experts in hazardous medication compounding and safe handling for both malignant and non-malignant indications (eg, classical hematology indications, autoimmune diseases).[2] These increasing demands necessitate careful examination of how a pharmacist's role in oncology should be structured and organized.

As illustrated above, the patient populations served by OPPs are extensive and continuously expanding. OPP's comprehensive understanding and application of personalized care principles are crucial to ensuring that patients receive the right medication, dose, and timing tailored to their unique needs, ultimately advancing patient outcomes and treatment safety.[4,5] Previous HOPA Scope of Practice documents have focused on the evolution of the profession and common roles for oncology pharmacists.[1,6] As the profession and healthcare continue to evolve, this scope of practice document focuses specifically on oncology pharmacists as direct patient care providers.

Care Settings and Specialization Models

OPPs practice in a variety of roles and care settings. As health care moves towards more team-based care, the scope and professional responsibilities of the pharmacist have subsequently evolved. Many of the changes in pharmacy practice have shifted the pharmacist's role from medication dispensing to patient-centered care.[7] However, these changes are heterogeneous, increasingly specialized, and vary widely depending on the site of care (inpatient vs ambulatory care, academic vs community cancer center), geographic location, and availability of resources.

Care Settings

An academic medical center is a healthcare institution that integrates clinical care, medical education, and research, and is often affiliated with a university or medical school. In many academic medical centers, oncologists specialize in an oncologic disease site for both patient care and research. OPPs may align with these specialties, or they may cover several oncologic disease sites. Additionally, OPPs who work within an academic medical center may have roles across a variety of settings, including inpatient, outpatient, infusion centers, and retail or specialty pharmacies. Subspecialized pharmacists who are dedicated to pain, anticoagulation, infectious disease, or palliative care may also provide supportive oncology care exclusively to oncology patient populations. In academic medical centers, the OPP will often spend time interacting with the larger health care team, either through patient rounds in inpatient roles or by answering questions directly from the care team in disease-state-specific clinics or infusion settings. Additionally, the academic OPP often participates in clinical trial engagement, offering deeper insight into emerging therapies and personalized medicine approaches.

Community cancer centers are healthcare facilities that deliver comprehensive cancer care, including diagnostics, treatment, and supportive services at the local or regional level. There are some community cancer centers that mirror the academic model, with sub-specialized care. Others are independent or physician-owned practices that prioritize care close to patients' homes. In contrast to academic medical centers, which have an emphasis on research, teaching, and complex multidisciplinary care, community cancer centers offer convenient patient-

centered care, especially for patients in rural or underserved areas. Compared to academic medical centers, community oncology practices tend to have providers who practice with a generalist approach, managing a broad spectrum of oncologic disease sites rather than focusing on subspecialties.[8] Similar to oncologists, the community OPP team member is expected to maintain a generalist skillset to meet daily patient care demands. For example, in addition to being a pan-tumor expert, the community OPP often possesses expertise in drug procurement, IV compounding, dispensing oral medications, and leadership responsibilities.

In both community and academic medical centers, the OPP may provide patient education, assist with treatment planning, answer questions from the larger healthcare team, verify orders, and teach trainees or other healthcare professionals. Although academic medical centers place greater emphasis on teaching learners, OPPs in both settings engage in teaching and mentoring, fostering a culture of continuous learning. Furthermore, the OPP may have a variety of additional roles and tasks within their purview. These tasks can include building regimen order sets, curating policies, formulary management, and overseeing other essential operational functions. OPPs in both settings may also face significant challenges in managing new and novel therapies. While OPPs in academic medical centers may routinely practice with certain complex medication types (eg, bispecific agents, T-cell engagers), OPPs in both settings must navigate complex treatment protocols to ensure patient safety and optimal outcomes. Additionally, due to organizational, regional, and national standards, OPPs who have infusion pharmacy roles or tasks must rigorously adhere to safety and regulatory standards, such as USP <797> and <800>.[9,10] Regardless of the care setting, generalist and specialized models of oncology pharmacy practice exist and must continually evolve to meet the demands of their environment.

Contemporary Oncology Roles

Oncology pharmacy has evolved significantly since its emergence as a distinct specialty in the 1980s. Initially focused on anticancer therapy preparation, administration, safety, and toxicity management, early practitioners operated as generalists, supporting patients across all cancer types and treatment modalities. Like the broader medical profession, oncology pharmacy has evolved in response to increasing complexity in knowledge, technology, and patient care needs. The introduction of targeted therapies in the late 1990s, such as imatinib and trastuzumab, marked a shift toward sub-specialization, requiring disease-specific knowledge and monitoring protocols that extended beyond traditional paradigms of anticancer therapy management. This evolution accelerated with the rise of immuno-oncology and the proliferation of novel therapeutic options, reshaping the scope and depth of oncology pharmacy practice. As cancer therapies evolve and treatment protocols become more nuanced, oncology pharmacists are required to synthesize advanced clinical knowledge with operational expertise, patient advocacy, and administrative oversight. For most OPPs, their responsibilities encompass a broad array of responsibilities, including direct patient care, medication safety, regulatory compliance, and financial navigation. These roles continue to expand to include leading quality improvement initiatives, educating healthcare professionals and patients, and managing intricate transitions of care. (*Appendix 1*). As such, new OPP roles are being created to meet these additional demands. Some positions demand broad generalist competencies, while others require deep subspecialty expertise. This dynamic landscape reflects the growing complexity of cancer care and the need for adaptable pharmacy professionals who can navigate both comprehensive and highly specialized oncology care environments. Current practice models vary widely across healthcare settings, with specialization approaches often tailored to institutional needs, patient populations, and available resources.

Contemporary Specialization Roles

As the field has matured, oncology pharmacy roles have increasingly shifted toward specialization. Specialization models are commonly organized around treatment modality (eg, oral vs intravenous therapy), oncologic disease site, or phase of care (eg, transplant, survivorship). Each model supports the delivery of high-quality, patient-centered care by aligning pharmacist competencies with the unique demands of specific clinical contexts.

Modality-Based Roles in Oncology Pharmacy Practice

Specialization in oncology pharmacy is increasingly organized around treatment modalities, reflecting the distinct clinical and operational demands of different therapeutic approaches. One prominent example is the emergence of pharmacist-led oral anticancer therapy clinics. While a definitive national count is unavailable, many institutions have implemented programs where pharmacists play a central role in managing oral anticancer therapy. In a 2018 survey by a working group of the Vizient cancer care committee, 71% of respondents stated that their institution had an established oral anticancer therapy management program, and 68% indicated that pharmacists played the primary role in providing these services. Furthermore, the core responsibilities of these clinics include ensuring safety, effectiveness, and patient adherence to oral anticancer agents.[11]

On the other end of the spectrum, intravenous (IV) anticancer therapy represents another modality requiring specialized pharmacy expertise. Infusion center pharmacists are responsible for the oversight of sterile compounding of cancer

treatments and supportive care medications and may also practice as an OPP.[3] Their role includes managing medication safety, mitigating side effect, ensuring appropriate treatment selection per evidence-based guidelines, selecting biosimilars based on insurance coverage, educating nurses, and ensuring compliance with rigorous standards for sterile preparation, environmental controls, and regulatory requirements. In recognition of the increasing complexity of sterile compounding, the Board of Pharmacy Specialties (BPS) introduced a dedicated certification in sterile compounding.[12]

Some institutions organize oncology pharmacy services around treatment modalities rather than oncologic disease state. This model typically separates oral anticancer therapy management from IV anticancer therapy services, recognizing the distinct skill sets required for each. Oral anticancer specialists focus on adherence counseling, drug interaction management, toxicity monitoring, dose modification, ensuring appropriate treatment selection per evidence-based guidelines and often coordinate with specialty pharmacies. Infusion center-focused pharmacy specialists concentrate on acute toxicity management, compounding protocols, compatibility assessments, and administration procedures in infusion centers.

This modality-based organization of oncology pharmacy reflects a broader trend toward specialization that enhances the safety, efficiency, and quality of cancer care. By aligning pharmacist roles with the unique demands of oral and IV anticancer therapies, organizations can better leverage pharmacist expertise to optimize treatment outcomes.

Disease Site Specialization

Oncology pharmacists are increasingly transitioning into roles that emphasize disease-specific specialization, developing focused expertise in areas such as hematologic malignancies, blood and marrow transplant, breast cancer, lung cancer, or gastrointestinal cancers. This model mirrors the subspecialty structure seen in medical oncology fellowship training, enabling pharmacists to gain in-depth knowledge of disease-specific treatment protocols, supportive care strategies, and emerging therapies. In these specialized roles, pharmacists often contribute to treatment planning, provide patient education, and may engage in independent clinical decision-making, including evaluating patients and prescribing treatments under collaborative practice agreements. These pharmacists are frequently embedded within oncology clinics, working closely with other providers, nurses, and additional members of the care team. Their integration into the clinical setting enhances multidisciplinary collaboration and supports high-quality personalized care.

This model allows the pharmacist to have deep-disease state knowledge spanning both oral and IV anticancer therapies and to address medication needs holistically for patients receiving combination oral/IV treatment regimens.

Phase of Care Specialization

In some institutions, certain oncology pharmacy services are organized around phases of care, such as specialists in hematopoietic stem cell transplant (HSCT), cellular immunotherapy, palliative care, and survivorship. This approach acknowledges that pharmaceutical care needs vary significantly across the cancer care continuum and often require distinct areas of expertise. For example, oncology pharmacists play a critical role in HSCT, monitoring complex therapeutic regimens essential to successful transplant outcomes, and contributing to the preparation and administration of therapy. Their involvement ensures safe and effective implementation of medication protocols, addresses potential drug-drug interactions, provides pharmacokinetic drug monitoring and dose adjustments, and helps reduce the risk of complications.[4] Like the OPP with a disease site specialization role, the OPP with a specialization around phases of care exemplifies their value in multidisciplinary care teams, where they enhance therapeutic outcomes and support clinical decision-making. As cancer treatment becomes increasingly personalized and complex, phase-based specialization allows oncology pharmacists to deliver more targeted, high-quality care tailored to the unique demands of each stage in the patient journey, from intensive treatment to long-term survivorship.

Contemporary Generalization Models

The generalist oncology pharmacist serves as a comprehensive expert across the full spectrum of pharmaceutical care in cancer treatment, sometimes referred to as a pan-tumor expert. This approach recognizes that oncology itself is a specialized field that requires deep knowledge that transcends individual tumor types. Many roles within oncology pharmacy demand a generalist background, requiring mastery of cancer pharmacotherapy while maintaining competency across disease states, treatment modalities, and phases of care. Generalists are often adept at recognizing toxicity patterns that span multiple cancers and understanding how therapeutic principles developed in one area may apply to others. This broad perspective enables them to identify clinical opportunities and safety concerns that may be overlooked by subspecialists focused on narrower disease areas.

Two more contemporary examples of this generalist model include pharmacists providing precision medicine/pharmacogenomics and phase I clinical services. As oncology shifts toward molecular-targeted therapies and histology-agnostic drug development, pharmacists must understand how medications behave across diverse patient populations and disease contexts. Treatments approved based on molecular characteristics, rather than tumor origin, require pharmacists with broad expertise to guide therapy decisions that optimize efficacy and minimize adverse effects.[5] Basket trials, such as those evaluating pembrolizumab for microsatellite instability-

high tumors, larotrectinib for NTRK gene fusion-positive cancers, and selpercatinib for RET-altered malignancies, exemplify this trend. These studies and their clinical applications demand pharmacists who can anticipate how targeted agents will perform across various tumor types, patient populations, and treatment settings. Similarly, phase I clinical trial pharmacists work directly with patients enrolled in early-phase studies, which frequently involve novel mechanisms of action, innovative drug combinations, and diverse patient populations with varied cancer types and treatment histories. The complexity of early-phase research demands a broad oncology knowledge base to anticipate drug interactions, identify monitoring requirements, and provide informed recommendations across heterogeneous clinical scenarios.

The contemporary landscape of oncology pharmacy is defined by a dynamic interplay between specialization and generalization. While specialized roles allow pharmacists to develop deep expertise in specific modalities, diseases, states, or phases of care, generalist roles remain essential for integrating knowledge across the cancer continuum. As cancer care continues to advance, the ability of oncology pharmacists to navigate both specialized and comprehensive roles will be critical to improving patient outcomes and shaping the future of oncology practice.

OPP Scope of Expertise

In all practice models, OPPs must maintain a robust and evolving knowledge base to meet the demands of modern cancer care. Their scope of expertise spans pharmacotherapeutics, clinical decision making, regulatory compliance, and patient-centered care. Whether functioning as generalists or subspecialists, OPPs are expected to understand the pharmacology and kinetics of anticancer agents, manage complex drug regimens, and anticipate adverse effects across diverse patient populations. Oncology pharmacists have solidified their role as integral members of the multidisciplinary care team, contributing far beyond the traditional boundaries of order verification.[13]

In clinical practice, OPPs contribute to or independently manage treatment planning, toxicity monitoring, and therapeutic adjustments based on patient-specific factors such as organ function, comorbidities, and genomic markers. Their expertise also extends to supportive care, including the management of nausea, pain, neutropenia, and other treatment-related complications.[14] Additionally, OPPs often conduct cancer therapy teaching sessions for patients and their families and, in some institutions, perform anticancer therapy consents to ensure patients are fully informed about their treatment plans and associated risks.

The breadth and complexity of responsibilities managed by OPPs, ranging from clinical decision-making and patient education to operational oversight and administrative duties, make it essential to identify opportunities for non-pharmacist team members to contribute through their own expertise and skill sets. Optimizing the use of pharmacy technicians, administrative staff, and other support personnel becomes increasingly important as demand for the specific expertise of OPPs and ongoing physician shortage continues to grow. Utilizing these non-pharmacist resources for non-clinical or protocol-driven tasks can help alleviate workload burdens and allow pharmacists to concentrate on high-value clinical activities that directly impact patient outcomes. **Table 1** outlines common responsibilities within oncology pharmacy practice that may be performed by other trained team members, thereby enhancing workflow efficiency and enabling pharmacists to devote more time to patient-centered care. Engaged support from pharmacy and medicine leadership will be crucial for this step, as well as the incorporation of new technologies, such as artificial intelligence. Example daily duties of an ambulatory or inpatient OPP are listed in Appendix II.

This shift in task distribution reflects a broader movement in pharmacy practice: transitioning some pharmacist roles away from routine verification and operational tasks towards more patient-facing roles that involve independent clinical decision making. In some hospital and outpatient settings, dedicated support staff help manage drug procurement, hazardous material handling, prior authorization, reimbursement, and/or financial assistance processes. This allows oncology pharmacists to focus more on clinical responsibilities such as medication therapy management, toxicity monitoring, prescribing and ordering treatments, and direct patient counseling. Emerging technologies that can automate certain tasks based on specific patient criteria or the use of artificial intelligence, which can help automate prior authorizations, offer promising solutions, but adoption remains uneven across care settings, and the associated cost to implement these tools may be a burden for certain health care organizations.[15] Ultimately, enabling oncology pharmacists to practice at the top of their license requires intentional staffing models, workflow redesign, technology integration, and institutional support.

OPP Care Services

Utilizing oncology pharmacists in expanded clinical roles can significantly reduce the administrative burden across the healthcare team. As cancer care becomes more complex and patient survival improves, physicians and advanced practice providers (APPs) are managing increasingly more patients.[16] This shift has led to mounting time pressures and reinforced the need for efficient, team-based care models. Physician shortages in oncology are well-documented and have contributed to rising burnout rates. In a 2023 survey conducted by the American Society of Clinical Oncology (ASCO), 59% of medical oncologists reported experiencing one or more symptoms of burnout, up from 34% in 2013.[17] Respondents emphasized

Table 1: Oncology Pharmacy Task Delegation

Task Type	Experienced/Advanced Oncology Pharmacist Activities*	Operations Pharmacist Activities (With or Without Oncology Experience)	Non-Pharmacist** Activities
Patient care and treatment	Provide and care for scheduled clinic or infusion-room patients or assigned inpatients, using CPAs/protocols as institutions/states allow (eg, supportive care, survivorship, anticancer therapy management)	Verify anticancer and related orders	Perform patient medication history
	Lead and/or participate in interdisciplinary team rounds (inpatient or outpatient)	Verify intravenous product preparation	Use tech-check-tech as able (eg, supportive care meds, oncology treatments)
	Participate in molecular oncology tumor board and/or leadership of precision oncology and pharmacogenomics efforts	Manage patient follow-up appointments and/or calls for infusion and/or oral anticancer therapy.	Schedule patient follow-up appointments and/or calls for infusion and/or oral anticancer therapy.
	Curate anticancer therapy template (ie, order set development and management)	Assist with anticancer therapy template curation (ie, order set development and management)	
		Monitor pharmacokinetics	
Education	Educate patient and caregiver about anticancer and related drug therapies	Assist with patient education about anticancer and related drug therapies	
	Act as oncology pharmacy residency or fellowship program director	Assist with pharmacy student and residency education and management of program	
	Provide and/or oversee staff education about oncology drug therapies (eg, providers, nursing, pharmacy, trainees)	Ensure certification and training of other infusion pharmacists	
Research	Participate in research and quality work as lead, principal investigator, co-investigator or mentor.	Assist with clinical trial/investigational drug handling, dispensing auditing	Assist with project, research, or residency program paperwork and maintenance.
Operations	Provide information or oversight for complicated clinical, operational, and logistical situations	Implement technology to advance operations (eg, gravimetric compounding)	Ensure daily regulatory and safety compliance
	Participate and/or lead organizational committees and programs (Cancer Committee, IRB, residency program, etc.)	Assist pharmacy technician with USP <800> and <797> and associated duties	Perform USP <800> and <797> and associated duties
			Procure drugs
			Manage drug inventory (eg, adding to dispensing cabinet, on-site delivery, appropriate storage, patient-specific storage, ordering)
Financial		Assist and/or oversee payor approval processes and patient access	Obtain prior authorization and reimbursement (use of AI to assist with letter generation as able
			Assist or perform financial assistance and/or procure free drug for patients
			Perform billing tasks including charge reconciliation

*Intended to maximize the experience of the highly trained oncology pharmacist expert.
**Examples include pharmacy technicians, medical assistants, scheduling staff.

the need for increased administrative and clinical support, including expanded roles for other healthcare professionals such as oncology pharmacists.[16] Additionally, a recent survey of oncology pharmacists sought to understand the value of tasks and professional satisfaction. By shifting oncology pharmacists' activities to direct patient care and working within the interdisciplinary patient-care team, enhanced job satisfaction and retention may be appreciated.[18]

OPPs are well-positioned to assume expanded patient management responsibilities. Their structured, patient-centered process of care integrates clinical expertise with evidence-based practices to optimize treatment outcomes. This approach, adapted from the Pharmacists' Patient Care Process, enables OPPs to contribute meaningfully across all phases of cancer care, from diagnosis and treatment planning to symptom management, education, and advocacy.[19]

Collaborative practice agreements (CPAs) offer a practical solution to this challenge by enabling pharmacists to take on tasks such as care coordination, routine lab ordering, and documentation within the electronic medical record. These agreements also increase pharmacist-patient interaction, allowing pharmacists to manage treatment directly, prescribe medications, and maintain routine contact with patients. CPAs support all members of the care team in practicing at the top of their license, improving efficiency and care quality. They are highly adaptable and have been implemented across inpatient units, infusion centers, ambulatory care clinics, and oral anticancer therapy programs, enhancing pharmacist roles in academic medical centers, community practices, and rural healthcare environments.[20]

OPPs in these settings often provide services such as anticancer therapy toxicity monitoring, supportive care, medication adherence, malignant pain control, gastrointestinal symptom management, myelosuppression prophylaxis, mucositis treatment, palliative and hospice care, and precision oncology practices.[14] In delivering these services, pharmacists may participate collaboratively or independently in the diagnostic process, ensuring accurate and timely diagnoses that improve patient outcomes.[201] This is achieved through routine collection and assessment of patient data, ordering or interpreting diagnostic tests, and integrating findings into comprehensive care plans.[212]

Numerous studies have demonstrated the effectiveness of CPAs in oncology pharmacy. A review by Johnson and colleagues[23] examined 41 publications from 2008 to 2023 and found consistent improvements in patient outcomes, medication adherence, and overall satisfaction across pharmacist-prescribing models. While initial reservations were noted among patients and physicians, follow-up surveys revealed high satisfaction with pharmacist-led care.

CPAs have been successfully implemented across a wide range of oncology pharmacy roles, including subspecialized disease-specific pharmacists, generalist OPPs managing multiple cancer types, and dedicated oral anticancer therapy clinics. A study by Andrick and colleagues[24] evaluated the impact of a full-time bone marrow transplant (BMT) pharmacist practicing under a CPA in a rural Pennsylvania center. For over two years, the pharmacist managed medication therapy for 40 allogeneic transplant patients, documented nearly 2,900 clinical interventions, and maintained a therapeutic immunosuppression range of 73.9%. Patient and caregiver surveys reflected high satisfaction with the pharmacist's involvement.

In another pilot study, Jackson and colleagues[25] assessed the use of a CPA for managing chemotherapy-induced nausea and vomiting (CINV) in outpatient oncology clinics. Over the course of the year, pharmacists made 188 clinical interventions for 45 patients, resulting in improved MASCC symptom scores and increased pharmacy service revenue. This CPA model demonstrates how generalist OPPs can effectively manage referred patients within a structured framework.

A third study by Indorf and colleagues[16] focused on a pharmacist-prescribing CPA in an oral anticancer clinic, specifically targeting immunomodulatory drugs (IMiDs) such as lenalidomide and pomalidomide. Pharmacists conducted comprehensive patient evaluations, ordered laboratory tests, managed REMS requirements, and prescribed supportive care for IMiD-related toxicities. While patients continued routine oncology visits, pharmacists assumed full responsibility for IMiD management. Among 295 patients enrolled in the program, adherence remained high post-intervention (95.55%, CI 0.6%–2.02%; P = 0.003), and the care team saved approximately 250 hours per month by centralizing these tasks.

These studies illustrate the expanding scope and value of oncology pharmacists in direct patient care. By taking on more comprehensive patient management tasks, pharmacists can address not only medication-related needs but also broader health concerns that influence treatment outcomes. Their ability to integrate clinical interventions, ranging from symptom management, mitigation of adverse effects, and nonpharmacologic lifestyle recommendations, enhances the effectiveness of pharmacologic therapy and supports patients' quality of life. As collaborative practice continues to evolve, pharmacists have demonstrated that they can contribute meaningfully to diagnosis, treatment planning, and ongoing care, ultimately improving patient experiences and relieving pressure on the broader oncology care team.[26]

OPPORTUNITIES TO SUPPORT OPP EXPANDED SCOPE

Credentialing and Competency

To execute prescribing authority, OPPs must undergo a formal credentialing process. The criteria for credentialing vary by state and institution but generally involve verification of qualifications that demonstrate a pharmacist's readiness to provide direct patient care.[27] Many states allow pharmacists to practice drug therapy management under provider status, and institutions often have protocols enabling pharmacists to order laboratory tests and prescribe medications within their scope of practice.

Credentialing serves as documented evidence of a pharmacist's qualifications, which may include diplomas, licenses, certifications, and other professional credentials.[27] Before beginning the credentialing process, pharmacists must obtain a National Provider Identifier (NPI) through the Department of Health and Human Services. Those intending to prescribe controlled substances must also secure a Drug Enforcement Administration (DEA) number.

The next step is entering into a CPA, which enables pharmacists to exercise prescribing authority within a defined scope. Collaborative prescribing is governed by state-specific laws and regulations, which vary widely across the United States. A comprehensive review by Sachdev and colleagues[28] highlighted the diversity of CPA frameworks. Presently, there is a large ongoing effort to modernize legislation, close regulatory gaps, and expand pharmacist access to prescribing privileges in a variety of states. State CPA regulations are listed in Appendix III.[29-49]

Most states permit pharmacists to initiate drug therapy under CPA laws. However, many restrict prescribing to medications explicitly listed in the CPA or tied to diagnoses outlined in the therapeutic plan. In seven states, pharmacists are not authorized to initiate therapy, limiting their role to adjusting existing medications. Additionally, several states prohibit or restrict the prescribing of controlled substances. Florida allows pharmacists to prescribe from a predefined list, though most items are over-the-counter medications. More restrictive CPA regulations may prohibit therapeutic substitution, require prescriber notification within 24 hours of any medication change, or delay changes until after the first three months of therapy.[28] These variations underscore the importance of understanding local laws and institutional policies when implementing CPAs.

Several states have implemented provisions for advanced pharmacist licensure, as outlined in Appendix IV.[28,49] In California, Montana, New Mexico, and North Carolina, pharmacists may obtain an Advanced Practice Pharmacist (APP) designation, which grants an expanded scope of practice under a collaborative practice agreement. These designations allow pharmacists to engage in enhanced clinical activities, such as prescribing medications and ordering laboratory tests. However, the requirements to obtain APP status can be substantial, and the scope of practice varies across states. For example, New Mexico offers one of the most expansive APP models, permitting pharmacists not only to prescribe but also to perform physical examinations. In contrast, California requires pharmacists to meet one of several criteria to qualify: additional certification, completion of a residency program, or at least 1,500 hours of practice under a CPA or protocol within the past 10 years.

Within the Veterans Affairs Health System, Oncology Clinical Pharmacist Practitioners can work within a scope of practice as direct patient care providers to manage drug therapies (oral and injectable), manage supportive care therapies, order labs, and submit consults for additional care as applicable.[50] Another emerging model is the Standard of Care regulatory model, which allows pharmacists to practice independently based on their training, expertise and widely accepted standards/guidelines rather than adhering to strict rules about what is and is not allowed, which is typical of pharmacy practice acts.[51] Idaho has adopted this regulatory model, which allows for flexibility of practice as advancements occur, such as with direct care provision. While these designations formalize advanced practice, in many cases, particularly outside of Idaho, New Mexico and the Veterans Affairs Health System, the activities permitted under APP status are not significantly different from those allowed in states without such designations. The value proposition of an added designation for direct patient care/APP needs to be considered. If federal legislation allowing pharmacists to serve as providers were in place, an additional designation like this at the state or institutional level would not be needed.

Although specialized training is not strictly required to initiate clinical pharmacy services, residency training or equivalent experience in managing oncology-related conditions is highly recommended. Given the increasing complexity of oncology therapeutics and the nuanced care required for patients with cancer, postgraduate year 1 (PGY1) pharmacy residency training, postgraduate year 2 (PGY2) oncology specialty residency training, or comparable clinical experience are strongly encouraged. Additional credentials, such as Board Certification in Oncology Pharmacy (BCOP) through BPS, further demonstrate clinical expertise and support progression to OPP roles. However, it is important to note that certifications and formal training do not replace the value of hands-on patient

care experience. To prepare for OPP roles, it is suggested that pharmacists meet one of the following experience thresholds:

- Completion of PGY1 and PGY2 in oncology
- Completion of PGY1 and a minimum of 2 years of oncology pharmacy clinical experience
- A minimum of 4 years of oncology pharmacy clinical experience

Credentialing is a foundational step in enabling pharmacists in OPP roles, including collaborative prescribing. While the process may vary across institutions and states, it ensures that pharmacists meet rigorous standards of education, training, and professional competency. By completing credentialing and required competency, pharmacists are formally recognized as qualified healthcare providers, capable of contributing meaningfully to patient care through prescribing, diagnostic support, and clinical decision-making. Furthermore, these pathways help ensure that pharmacists entering collaborative or independent practice roles possess the depth of knowledge and clinical judgement necessary to deliver high-quality oncology care. As the role of oncology pharmacists continues to expand, robust processes will remain essential to maintain quality, safety, and trust within multidisciplinary care teams.

Multidisciplinary Support

Oncology-trained pharmacists bring a high level of specialized education, certification, and clinical expertise that uniquely qualify them to participate in direct patient care. Despite this, some nurse practitioners, physician assistants, and physicians may initially express reservations about extending provider status to oncology pharmacists. These concerns often arise from historical perceptions of pharmacists as primarily safety-oriented gatekeepers rather than independent clinical decision-makers. Even when pharmacists hold provider status, institutional safeguards remain in place: all orders entered by the OPP are still verified by another pharmacist, ensuring a dual-check system that minimizes risk. Mid-level providers, in particular, may worry that expanding pharmacists' authority could encroach upon their established roles or create uncertainty around professional identity and autonomy. However, OPPs bring specialized expertise in anticancer therapy dosing, toxicity management, and supportive care, which complements, not replaces, the role of prescribers and mid-levels. Evidence demonstrates that integrating pharmacists in this capacity improves treatment accuracy, reduces adverse events, and optimizes patient outcomes.

Additional hesitation may stem from questions about liability, reimbursement structures, and whether pharmacists possess sufficient training to autonomously manage complex oncology regimens. In reality, oncology pharmacists undergo rigorous postgraduate residency training, often complete additional oncology-specific fellowships, and achieve credentials that validate their advanced competency in anticancer therapy management, supportive care, toxicity monitoring, and evidence-based therapeutic decision-making. Their expertise allows them to safely assume responsibilities such as treatment adjustments, symptom management, and adherence counseling.

Many of these concerns can be effectively addressed by establishing clear workflows for interdisciplinary care coordination and by educating colleagues about the pharmacist's robust clinical training and capacity for independent decision-making. Rather than diminishing the roles of other providers, collaborative oncology pharmacy practice alleviates workforce strain, reduces provider burden, and enhances the quality and timeliness of patient care while maintaining a shared commitment to safety, effectiveness, and optimal clinical outcomes

OPPs as providers can enhance patient care without compromising safety or collaboration. This collaborative approach allows OPPs to manage complex medication regimens efficiently while maintaining accountability and reinforcing interprofessional trust.

Reimbursement for Services

Billing for pharmacy services has been a limitation based on current regulations. Historically, pharmacists in ambulatory care have faced billing limitations primarily because the Centers for Medicare & Medicaid Services (CMS) did not routinely recognize them as providers.[52] The Health Resources and Services Administration (HRSA) defines a Licensed Independent Practitioner (LIP) as "a physician, dentist, nurse practitioner, nurse midwife, or any other individual permitted by law and the organization to provide care and services without direction or supervision, within the scope of the individual's license and consistent with individually granted clinical privileges." This allows state licensing laws to permit individuals to practice independently of physician supervision. However, the federal government does not have any such recognition.[53] Unlike most LIPs, pharmacist LIPs typically do not incorporate physical examination and assessments into their services. This differentiation prevents them from billing for services under the current US billing structure, which follows CMS billing for evaluation and management (known as "E/M") services.[54] The key components to billing for these services include documentation of chief complaint, history, physical examination, and medical decision-making. Although pharmacists do not routinely diagnose problems, they do use physical examination findings to manage medication-related problems.[55-57]

Opportunities for reimbursement of pharmacy services are now expanding with many states creating legislation allowing pharmacists to bill as providers under state Medicaid programs or private insurance plans. However, some restrictions may still apply (such as the ability to bill on the same day as

another provider), and this still doesn't allow for billing through Medicare plans.[55] Thus, even when pharmacists are considered providers, they are still not able to bill for their services on the same day as the treating oncologists, thus supporting the need to recognize and give OPP autonomy. Evolving methods of reimbursement of pharmacy care services, such as value-based care, patient-centered medical homes, and vertically integrated healthcare models, are also possible mechanisms for reimbursement, although historically have focused on chronic diseases outside of oncology care.[58]

Preparing Future Workforce

To help advance the field of pharmacy, pharmacy school accreditation standards now require diagnosis and prescribing, particularly for self-care disease management.[59] Some schools of pharmacy have already taken the steps to train pharmacy students in diagnosis and prescribing, paving the way to advancing the profession.[20] As such, the next generation of pharmacy graduates will have additional knowledge, skills, and competency as it relates to diagnosis and prescribing. Opportunities also exist to train practicing pharmacists through ACPE certification programs like those offered for immunization, medication therapy management, and contraception prescribing.

It is also essential to invest in the training of pharmacy technicians and other non-pharmacist staff. By equipping these team members to safely perform appropriate tasks that have traditionally been managed by clinical pharmacists, OPPs can significantly expand their capacity to deliver direct patient care. This approach increases opportunities for pharmacists to focus on higher-level clinical activities while enhancing overall care for oncology patients. This can be accomplished by sharing best practices from institutional training programs and developing dedicated continuing education opportunities for oncology pharmacy support personnel.

Conclusion

As medication experts with advanced training and expertise, oncology pharmacists can and do function as independent providers. Supporting this role of the OPP will not only benefit the provider workforce, which is experiencing a shortage, but can also improve patient care outcomes. Continued efforts are needed, however, to support this expanded scope of the OPP. This includes training oncology pharmacists to be proficient in diagnostic and prescribing skills and having institutional administrative support. Furthermore, recognition as independent providers at the institutional, state, and federal level and appropriate reimbursement mechanisms are essential.

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APPENDICES

1. Roles and Responsibilities of the Oncology Pharmacist
2. Example Days in the Life of OPPs
3. U.S. States with Pharmacist CPA Regulations
4. U.S. States With APP Regulations

Appendix I: Roles and Responsibilities of the Oncology Pharmacist

Inpatient Clinical Oncology Pharmacist*	Ambulatory Clinical Oncology Pharmacist*
Clinical • **Verify Regimen Appropriateness** Ensure anticancer orders comply with NCCN/ASCO guidelines and patient-specific factors such as pharmacogenomic data and targeted molecular mutations (eg, next generation sequencing). Ensure informed consent/assent is documented. • **Comprehensive Patient Review** Perform ongoing assessments for regimen appropriateness, adherence, and toxicity management and adjust therapies as appropriate. Review drug-drug interactions (including supplements), manage anticancer-related adverse events (eg, nausea/vomiting, neuropathy, infections), adjust TPNs as needed, and perform antimicrobial stewardship. • **Participate in Multidisciplinary Rounds** Provide medication-related recommendations, answer drug information questions, and collaborate on symptom management and dose adjustments. • **Prescribe Under Protocol** Initiate or adjust anticancer medications and supportive care medications as permitted. • **Therapeutic Drug Monitoring** Monitor and adjust doses for drugs requiring pharmacokinetic oversight (eg, busulfan, tacrolimus). • **Medication Reconciliation and Continuity of Care** Oversee reconciliation at admission and discharge; ensure continuity of care during transitions from inpatient to outpatient. • **Clinical Trial Assessment** Evaluate patient eligibility for clinical trials. • **Facilitate Medication Access** Coordinate prior authorizations, insurance approvals (including off-label indications), and work with specialty pharmacies and financial counselors. • **Coordinate Therapy Administration** Collaborate with nursing staff to ensure accurate and timely administration of anticancer therapy. • **Transition of Care Support** Assist with transitions between outpatient and inpatient settings for high-risk patients (eg, induction therapy, HSCT, CAR-T, bispecific antibodies).	**Clinical** • **Verify Regimen Appropriateness** Ensure anticancer orders comply with NCCN/ASCO guidelines and patient-specific factors such as pharmacogenomic data and targeted molecular mutations (eg, next generation sequencing). Ensure informed consent/assent is documented. • **Comprehensive Patient Review** Perform ongoing assessments for regimen appropriateness, adherence, and toxicity management and adjust therapies as appropriate. Review drug-drug interactions (including supplements), manage anticancer-related adverse events (eg, nausea/vomiting, neuropathy, infections), and address medication refills as needed. • **Symptom Management** Manage anticancer-related toxicities (eg, nausea/vomiting, neuropathy, infections) and provide symptom control strategies. • **Bone Marrow Transplant, Bispecific, or CAR T-Cell Preparation** Review patients prior to inpatient admission, including conditioning regimen dose calculation, immunizations, drug acquisition, lab review, drug interactions, and patient education. • **Prescribe Under Collaborative Practice Agreements** Initiate or adjust anticancer medications and supportive care medications as permitted. • **Therapeutic Drug Monitoring** Monitor and adjust doses for drugs requiring pharmacokinetic oversight (eg, tacrolimus). • **Clinical Trial Assessment** Evaluate patient eligibility for trials. • **Facilitate Medication Access** Coordinate prior authorizations, insurance approvals (including off-label indications), and work with specialty pharmacies and financial counselors. • **Transition of Care Support** Assist with transitions between outpatient and inpatient settings for high-risk patients (eg, induction therapy, HSCT CAR-T, bispecific antibodies).

Inpatient Clinical Oncology Pharmacist* continued

Education

- **Patient Education**
  Provide structured education on anticancer therapy, supportive care, adherence, safe handling, and disposal. Include drug names (generic and brand), dosing, schedule and develop treatment calendars, adverse effects, fertility considerations, treatment goals, and financial aspects.
- **Healthcare Team Education**
  Deliver ongoing education to physicians, APPs, nurses, and other disciplines on clinical updates, policies, and toxicity management.
- **Preceptorship**
  Mentor pharmacy residents and students in clinical oncology practice.

Administration / Non-Clinical Responsibilities

- **Treatment Plan Development**
  Collaborate with physicians, nurses, and informatics to create or update electronic treatment plans, ensuring premedication and supportive care are embedded.
- **Drug Shortage Management**
  Implement strategies to minimize impact on patient care and maintain medication safety.
- **Documentation and Reporting**
  Maintain accurate EMR documentation of orders, interventions, and patient encounters; report medication errors and adverse drug events.
- **Policy and Guideline Development**
  Contribute to institutional policies, drug monographs, and participate in hospital committees (eg, P&T, IRB, safety committee).
- **Tumor Boards and Care Teams**
  Actively participate in multidisciplinary oncology care teams, tumor, and molecular boards
- **Patient Education Material Development**
  Assist in creating standardized education and follow-up materials.

Ambulatory Clinical Oncology Pharmacist* continued

Education

- **Patient Education**
  Provide structured education on anticancer therapy, supportive care, adherence, safe handling, and disposal. Include drug names, dosing, schedule and develop treatment calendars, adverse effects, fertility considerations, treatment goals, and financial aspects.
- **Patient Follow-Up and Reassessment**
  Systematically assess adherence and toxicities for anticancer therapies; perform reassessment of oral anticancer therapies within 14 days, including labs, medication start date, drug interactions, tolerance, and acquisition issues.
- **Healthcare Team Education**
  Deliver ongoing education to physicians, APPs, nurses, and other disciplines on clinical updates, policies, and toxicity management.
- **Preceptorship**
  Mentor pharmacy residents and students in ambulatory oncology practice.

Administration / Non-Clinical Responsibilities

- **Treatment Plan Development**
  Collaborate with physicians, nurses, and informatics to create or update electronic treatment plans, ensuring premedication and supportive care are embedded.
- **Drug Shortage Management**
  Implement strategies to minimize impact on patient care and maintain medication safety.
- **Documentation and Reporting**
  Maintain accurate EMR documentation of orders, interventions, and patient encounters; report medication errors and adverse drug events.
- **Policy and Guideline Development**
  Contribute to institutional policies, drug monographs, and participate in hospital committees (eg, P&T, IRB, QOPI, safety committee).
- **Tumor Boards and Care Teams**
  Actively participate in multidisciplinary outpatient oncology care teams and tumor boards.
- **Patient Education Material Development**
  Assist in creating standardized education and follow-up materials

Specialty Pharmacy Oncology Pharmacist

Clinical

- **Optimize Anticancer Orders & Comprehensive Review**
  Ensure anticancer orders comply with NCCN/ASCO guidelines and patient-specific factors. Perform ongoing assessments for regimen appropriateness, adherence, and toxicity management and adjust therapies as appropriate. Review drug-drug interactions (including supplements) and supportive care needs. Manage anticancer-related adverse events (eg, nausea/vomiting, neuropathy, infections) and address medication refills as needed.
- **Medication Access Coordination**
  Work closely with financial counselor, pharmacy technicians, and manufacturers to ensure timely access to anticancer therapies.

Education

- **Patient Education**
  Provide structured education on anticancer therapy, supportive care, adherence, safe handling, administration, and disposal. Include drug names, dosing, schedule, adverse effects and management strategies, fertility considerations, treatment goals, duration, and financial aspects.
- **Follow-Up and Reassessment**
  After initial oral dispensation, systematically assess adherence and toxicities; perform reassessment within 14 weeks, including labs, medication start date, drug interactions, tolerance, and acquisition issues.

Administration / Non-Clinical Responsibilities

- **Policy and Guideline Development**
  Assist with creating and updating policies, guidelines, and education materials, including hazardous drug handling processes.
- **Compliance and Accreditation**
  Ensure record-keeping meets accreditation standards (eg, URAC).
- **Medication Safety Reviews**
  Lead root cause analysis of oral chemotherapy medication errors and implement corrective actions.

Infusion Center or Decentralized Hospital Oncology Pharmacist

Clinical

- Verify Regimen Appropriateness
- Ensure anticancer orders comply with NCCN/ASCO guidelines and patient-specific factors. Ensure informed consent / assent is documented.
- **Optimize Anticancer Orders & Comprehensive Review**.
- Perform ongoing assessments for regimen appropriateness, adherence, and toxicity management and adjust therapies as appropriate. Review drug-drug interactions (including supplements) and supportive care needs.
- Medication Verification and Preparation Check
- Validate dose calculations, total volume, expiration date, diluent type and volume, administration fluid and tubing, lifetime dose (if applicable), compatibility with other infused drugs, and auxiliary labeling.
- **Therapeutic Drug Monitoring**
  Monitor and adjust doses for drugs requiring pharmacokinetic oversight.
- **Final Verification Before Administration**
  Verify antineoplastic agents and premedications prior to release to nursing staff.

Education

- **Preceptorship**
  Mentor pharmacy residents and students in oncology practice.
- **Nursing Education**
  Educate nurses on safe handling, administration, and toxicity management of anticancer medications.

Administration / Non-Clinical Responsibilities

- **Supervision and Compliance**
  Supervise pharmacy technicians and ensure compounding safety aligns with state and federal regulations (eg, Joint Commission, USP 797/800).
- **Policy and Guideline Development**
  Assist with creating and updating policies, guidelines, and drug monographs.
- **Committee Participation**
  Serve on institutional committees (eg, shared governance).
- **Medication Safety and Reporting**
  Enter medication errors and adverse drug events into reporting systems; lead safety initiatives for anticancer therapy.
- **Regulatory and Program Compliance**
  Ensure adherence to 340B Drug Pricing Program requirements (eg, biosimilar interchange) and uphold anticancer safety and quality standards.

Practice Management Oncology Pharmacist

Operational Oversight

- **Personnel and Facility Management**
  Oversee staffing, workflow, and physical pharmacy operations to ensure efficiency and compliance.
- **Inventory and Budget Control**
  Manage drug inventory, monitor budgets, update chargemaster, and ensure cost-effective operations while maintaining patient safety.
- **Contract and Financial Management**
  Negotiate manufacturer and payer contracts, manage approvals for high-cost medications, and review investigational drug pipelines for budget impact (eg, 340B Drug Pricing Program).

Leadership

- **Committee Participation and Decision-Making**
  Serve on key committees (eg, P&T, Medication Safety, Clinical Practice) to influence institutional policies and clinical standards.
- **Service Development and Implementation**
  Guide creation and execution of pharmacy services, policies, and SOPs, including those aligned with QOPI metrics.
- **Practice Certification and Accreditation**
  Collaborate with stakeholders to certify pharmacy sites and ensure compliance with regulatory and accreditation standards.

Policy and Compliance

- **Policy Development**
  Establish formal policies for ordering, receiving, storing, and handling anticancer agents following USP<800> and <797> guidelines.
- **Guideline Review and Workflow Optimization**
  Continuously review updated clinical guidelines and implement practice-changing workflows.
- **Regulatory Compliance**
  Ensure adherence to state, federal, and accreditation requirements for oncology pharmacy operations.

ASCO, American Society of Clinical Oncology; CAR, chimeric antigen receptor; EMR, electronic medical record; HSCT, hematopoietic stem cell transplantation; IRB, institutional review board; NCCN, National Comprehensive Cancer Network; P&T, Pharmacy & Therapeutics; QOPI, Quality Oncology Practice Initiative; SOP, standard operating procedures; TPN, total parenteral nutrition; USP, United States Pharmacopeia.*Some responsibilities overlap between Ambulatory and Inpatient Clinical Oncology Pharmacists and infusion center or decentralized hospital pharmacists. Institutions typically define where double-checks are required, so role-specific duties may vary.

Appendix II. Example Days in the Life of OPPs

Example of a Day in the Life of an Ambulatory OPP

- Participate in morning team meetings
- Conduct independent visits with patients receiving anticancer therapy; providing direct patient care through treatment planning and comprehensive assessment
    - Order upcoming imaging (eg, ECHO, ECG, DXA) or labs needed for active treatment patients
    - Order or arrange for subsequent follow-up visits (eg, face-to-face, video, phone)
    - Order genetic testing as applicable and if not already completed
    - Assess for clinical trial eligibility*
    - Provide symptom management caused by treatments or oncologic disease*
    - Assess and manage compliance and drug-interactions*
    - Educate about anticancer therapy and toxicities
    - Use collaborative multidisciplinary approach to patient care to ensure care continuity and enhance patient outcomes
        - Place referrals to other disciplines (eg, social work, genetics counselor, cardio-oncology, integrative medicine)
        - Consult with other providers regarding therapy changes, new at-risk findings (eg, significant infection, worsening of chronic conditions, emergent clinical findings)
- Conduct follow-up with patients receiving active treatment or on surveillance who have had new imaging and/or laboratory results that impact treatment/surveillance plan
- Coordinate transitions of care

Additional activities could include:

- Answer drug information questions from the healthcare team*
- Conduct comprehensive health history and physical assessment of referred patients with hematologic abnormalities, cancers, +/- family history of the same and/or known suspected hereditary blood disorder or cancer predisposition syndrome and refer to appropriate provider for E/M
- Conduct or participate in research and scholarly activities (eg, publications, professional speaking)*
- Create and maintain EMR reports that promote direct patient care activities and improved patient outcomes*Create survivorship plan for patients, including cancer surveillance and/or preventative care treatments (eg, immunizations, colonoscopies, mammograms/breast MRI)
- Lead or participate in anticancer and supportive care treatment plan creation and maintenance*
- Lead or participate in precision oncology team meetings*
- Lead or participate in quality improvement or accreditation meetings (eg, COC, ASCO QOPI)*
- Participate in cancer conferences or tumor boards*
- Participate in investigational review board*
- Participate in local, regional or national meetings to advance the improvement of patient care or healthcare*
- Participate in oncology pharmacy and therapeutics committee*
- Precept pharmacy or medical students and/or residents and fellows*
- Provide education to healthcare team*
- Provide insight or assist with challenging cases regarding*:
    - Drug shortage situations and procurement
    - Optimizing technology to advance operations
    - Order verification
    - Prior authorization and financial assistance

*indicates activities that can be done in advancing practices that do not allow for scheduled direct patient-care visits

Example of Day in the Life of an Inpatient OPP

- Participate in team meetings
- Participate in patient "rounds"
- Prepare by reviewing events occurring overnight, new labs and diagnostic test results, clinical situation, drug therapy plan
- Order medications/labs/diagnostic tests and communicate expert drug therapy recommendations to the team
- Assess* and manage patients receiving anticancer therapies within the hospital
    - Order necessary labs and imaging (eg, ECHO, ECG, DXA)
    - Provide symptom management caused by treatments or oncologic disease
    - Assess and manage drug-interactions
    - Consult with other providers regarding therapy changes, new at-risk findings (eg, significant infection, worsening of chronic conditions, emergent clinical findings)
    - Assess for clinical trial eligibility
- Assess and manage acutely ill oncology patients
    - Order and provide management of necessary labs
    - Provide symptom management caused by treatments or oncologic disease
    - Assess and manage drug-interactions
    - Consult with other providers regarding therapy changes, new at-risk findings (eg, significant infection, worsening of chronic conditions, emergent clinical findings)
    - Assess for clinical trial eligibility
    - Communicate care with oncology outpatient clinic as applicable
- Prepare for new admissions, discharges, and coordinate transition of care
    - Write discharge medication prescriptions
    - Educate the patient / family on the next steps of care (eg imaging, treatment continuation, lab monitoring, follow-up)
- Review and plan for the next day's anticancer therapy administration schedule

Additional activities could include:

- Answer drug information questions from the healthcare team
- Conduct or participate in research and scholarly activities (eg, publications, professional speaking)
- Create and maintain EMR reports that promote direct patient care activities and improved patient outcomes
- Lead or participate in anticancer and supportive care treatment plan creation and maintenance
- Lead or participate in precision oncology team meetings
- Lead or participate in quality improvement or accreditation meetings (eg, COC, ASCO QOPI)
- Participate in cancer conferences or tumor boards
- Participate in investigational review board
- Participate in local, regional or national meetings to advance the improvement of patient care or healthcare
- Participate in oncology pharmacy and therapeutics committee
- Precept pharmacy or medical students and/or residents and fellows
- Provide education to healthcare team
- Provide insight or assist with challenging cases regarding:
    - Drug shortage situations and procurement
    - Optimizing technology to advance operations
    - Order verification

Appendix III. U.S. States with Pharmacist CPA Regulations[29-49]

CPA Restriction	States With Restrictions
Requires additional qualifications or requirements beyond licensing	CA, CO, DC, FL, GA, MA, MD, ME, MO, NJ, NH, NM, NY, NC, RI TX, WV
Is not allowed in community pharmacy or only allowed in hospital settings	NY
Requires application to the State Board of Pharmacy or Board of Pharmacy oversight	AL, AK, AR, FL, GA, LA, ME, MD, MS MO, NC, NJ, NM, NY, WV
Does not allow pharmacist to initiate therapy	LA, NJ, WV
Does not allow ordering of or limits changes for controlled substances	IA WV
Does not allow therapeutic substitution	LA
Requires notification of ordering provider within 24 hr	CT
Does not allow changing a medication in first 3 months of therapy	ME
Pharmacist not allowed to perform a physical exam other than vital signs	WV

CPA, collaborative practice agreement. Compiled December 2025.

Appendix IV. U.S. States With APP Regulations[28,49]

Regulation Components	California Advanced Practice Pharmacist (APh)	New Mexico Pharmacist Clinician (PC)	Montana Clinical Pharmacist Practitioner (CPP)	North Carolina Clinical Pharmacist Practitioner (CPP)
Requires active pharmacy license	X	X	X	X
Qualification criteria	Meet 2 of 3 criteria: 1. Possess current certification in relevant practice area 2. Completion of US postgraduate residency 3. 1500 hr of clinical experience under CPA or protocol to patients ≤ 10 yr of application where clinical experience includes initiating, adjusting, modifying or discontinuing drug therapy	Meet all the following: 1. Possess current certification 2. Submit a log of relevant patient encounters with number of contact hr 3. CPA with a collaborating provider	Complete the yr of experience that meet BPS certification requirements and hold ≥ 1 following active certifications: • BPS certification • Nationally recognized certification equivalent to BPS certification standards • CPA with a collaborating provider	Meets 1 of the following: 1. Earned BPS certification; certified geriatric pharmacist as certified from the Commission for Certification in Geriatric Pharmacy, or has completed an accredited residency program with 2 yrs of clinical experience 2. Holds a PharmD, has 3 yr of clinical experience, completed a NCCPC- or ACPE-approved certificate program in practice area practice covered by the CPP agreement 3. Holds a BS-Pharmacy degree, has five yr of ACPE- approved certificate programs with ≥ 1 program in practice area practice covered by CPP agreement Has a signed CPA with a collaborating provider
Certification requirements	30 hr of self-study modules 8 hr live seminar Comprehensive final examination	60-hr board approved physical assessment course 150-hr, 300 patient contact preceptorships physician- (or other practitioner with prescriptive authority) supervised with hr counted only during direct patient interactions	Provide drug therapy management including initiating, modifying, or deprescribing Identify and manage drug-related problems or order tests under prescriber direction/ supervision	Provide drug therapy management, including CS, under the licensed physician direction/ supervision
Authorized activities	Perform patient assessments Order and interpret drug therapy-related tests Refer patients to other HCPs Participate in E/M of diseases and health conditions in collaboration with other HCPs Adjust, initiate, and discontinue drug therapy under accordance with physician or facility protocol	Initiate, modify, or discontinue therapies Identify and manage drug-related problems Perform physical exams Order tests under direct prescriber supervision		

ACPE, Accreditation Council for Pharmacy Education; BS, Bachelor of Science; BPS, Board of Pharmacy Specialties; CPA, collaborative practice agreement; CPP, clinical pharmacist practitioner; CS, controlled substances; E/M, evaluation and management; HCPs, health care providers; NCCPC, North Carolina Center for Pharmaceutical Care; PharmD, Doctor of Pharmacy.