



SHIELDS
HEALTH SOLUTIONS



WHITE PAPER

Optimizing Oncology Outcomes:

The Impact of Pharmacist-Led Interventions

KEY CONCEPTS

- Preventable medication-related issues negatively impact patient outcomes.
- Proactive monitoring by an integrated specialty pharmacy care team with access to the electronic medical record (EMR) enables early intervention.
- Pharmacist-led interventions in an integrated Health System Specialty Pharmacy (HSSP) improve clinical outcomes, enhance patient and provider satisfaction, and lower healthcare costs.
- High-impact patient engagement, in the form of diligent monitoring, education, support, and intervention, is particularly impactful for patients with cancer being treated with oral oncolytics.

INTRODUCTION

Cancer is not just a clinical diagnosis — it's a life-altering event that touches every aspect of a patient's world. From the moment treatment begins, patients face a cascade of challenges: physical side effects, emotional strain, financial burdens, and the complexity of managing multiple medications and appointments. For those prescribed oral oncolytics, the path can be especially difficult; unplanned emergency visits and hospital stays are common.^{1,2}

Key Problem

Therapy complications can result in sub-optimal outcomes and ER/hospital visits that increase the cost of care. In a non-integrated pharmacy care model, the pharmacist does not have access to valuable information related to the patient's health status; this limits the ability of the pharmacist to optimize care and intervene when necessary.

Complexity of Oral Oncolytic Therapy



High cost of medications



High-risk medications with severe toxicity profiles



Risk of drug interactions and organ function deterioration



Polypharmacy and complicated dosing schedules



Frequent dose modifications and therapy interruptions based on response and side effects

Proposed Solution

An integrated model that supports close clinical monitoring of patients on oral oncolytic therapy, particularly early in treatment, combined with timely, patient-centered pharmacist engagement and interventions to support proper medication use, can help to:



Prevent adverse events



Address medication issues, such as drug interactions



Overcome adherence barriers



Optimize treatment



Reduce costs

Through high-impact patient engagement characterized by clinical prescreening, frequent proactive outreach, and ongoing patient support, these interventions enhance care coordination, reduce hospital utilization, and drive substantial cost savings.³



APPROXIMATELY
1 in 10

unplanned hospitalizations of patients with cancer are associated with an adverse drug event (ADE).⁴

THE ROLE OF PHARMACIST-LED CLINICAL INTERVENTIONS IN ONCOLOGY CARE

In an integrated health system pharmacy setting, clinical pharmacists have access to the health record and are connected to the rest of the patient's care team. This integration enables pharmacists to play a pivotal role in multidisciplinary care teams, leveraging their expertise in medication management and patient care to optimize medication use and enhance patient outcomes. Integration into the care team creates the opportunity for pharmacists to seamlessly assess the need for and recommend clinical interventions.

What Are Clinical Interventions, and Why Are They Important?

A clinical intervention is any action focused on improving a patient's health or outcomes. Pharmacist-led interventions in an integrated HSSP framework involve proactive and ongoing identification of medication-related issues by pharmacists, along with management of these issues in collaboration with other clinicians.⁶

In an oncology setting, an intervention can be as significant as a dose change or drug change to mitigate major adverse drug events (ADEs), or as simple, yet impactful, as guiding a patient toward supportive medications, such as anti-nausea or anti-diarrheal drugs, to support adherence, comfort, and quality of life. Interventions may also include lifestyle modifications and other non-pharmacological mitigation strategies.

For patients taking oral oncolytics, clinical interventions have been shown to support adherence and persistence, despite the adverse effects that can occur during treatment with these powerful drugs.³ These strategies support better outcomes, reduced hospital admissions and ER visits, and reduced cost of care. Improving adherence and resolving the challenges of side effects are particularly notable for helping to avoid costs.



56%

of patients with cancer have at least one comorbidity⁵



Types of Clinical Interventions

- › Adherence
- › Administration
- › Care Coordination
- › Education
- › Lab Monitoring
- › Side Effect Management

Most Frequent Outcomes for Clinical Interventions in Oncology*

In the specific case of Shields Health Solutions and its nationwide network of health system partners, preventing therapy complications, improving therapy adherence, and resolving side effect challenges were the most commonly observed intervention outcomes in the oncology setting during a recent three-year period. The most commonly intervened-on oral oncolytics were capecitabine, abiraterone acetate, and venetoclax.

Clinical interventions for the top three outcomes resulted in cost avoidance of over \$75 million over this three-year period, with an average provider acceptance rate of 91%. Preventing therapy complications resulted in the highest cost avoidance, making up approximately 58% of the total.



Potentially Improved Therapy Adherence*

Capecitabine
Abiraterone
Venetoclax
Abemaciclib
Temozolomide



Prevented Therapy Complication*

Capecitabine
Abiraterone
Venetoclax
Zanubrutinib
Palbociclib



Resolved Side Effect Challenges*

Capecitabine
Abiraterone
Abemaciclib
Venetoclax
Zanubrutinib

Source: Shields Network, April 2022 – April 2025

*From Most to Least Frequent



\$75M

in Cost Avoidance

Over a three-year period, Shields' pharmacist-led clinical interventions for the top three outcomes helped **avoid more than \$75 million in healthcare costs.**

The Benefits of Clinical Interventions

Pharmacist-led clinical interventions are a high-impact form of patient engagement that improves the quality of care delivery. Through frequent, proactive touchpoints, specialized clinical pharmacists can identify and resolve issues earlier. This delivers significant incremental benefits, including:



Improved Patient Outcomes: An abundance of pharmacy touchpoints allows problems to be identified and resolved earlier. Frequent check-ins with patients are highly effective in promoting adherence to treatment plans, helping to prevent premature discontinuation.



Enhanced Patient and Provider Satisfaction: Pharmacist interventions foster trust and collaboration among patients and healthcare providers. Integrated specialty pharmacy can **dramatically increase patient satisfaction.**



Cost Avoidance and Financial Benefits: When clinical interventions resolve problems sooner, cost avoidance and cost savings follow.

THE SHIELDS HEALTH SOLUTIONS APPROACH

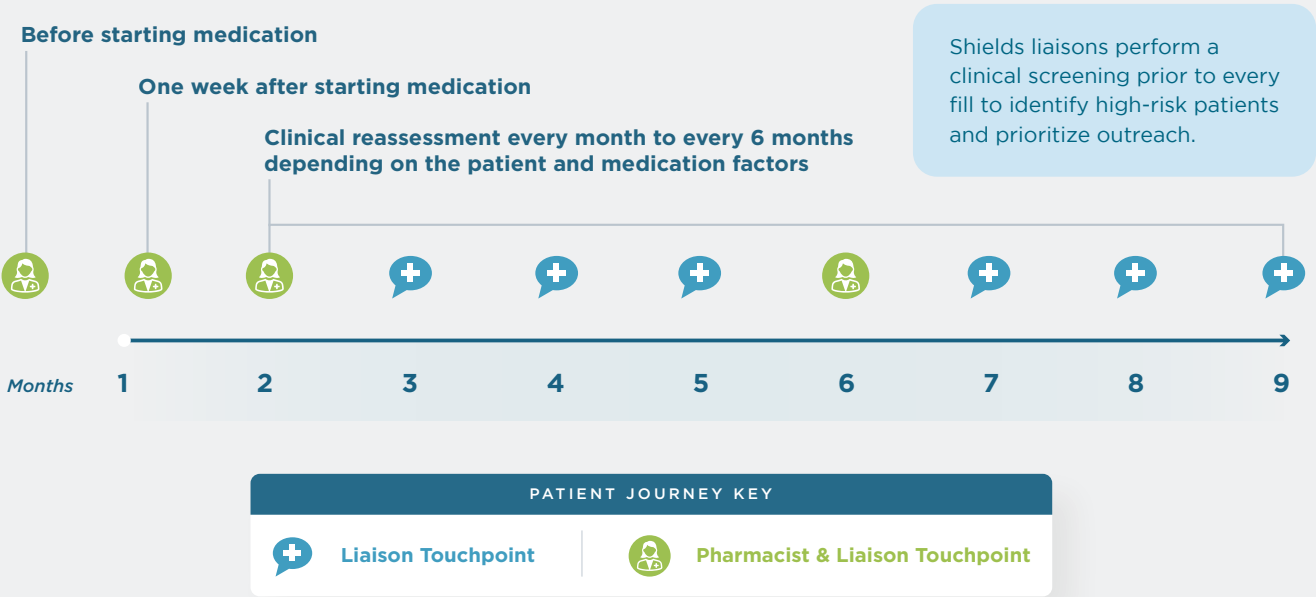
The Shields Care Model is built to support specialty patients throughout their treatment journey through consistent engagement, coordination, and timely clinical interventions. Exceeding national standards, our model includes monthly check-ins, virtual monitoring, a 24-hour help line, and proactive pharmacist follow-ups. With a nationwide network of remote and on-site certified clinical pharmacists, Shields removes geographic barriers to care — enabling access to top-tier talent with diverse expertise and advanced credentials. This scalable approach enables health system partners to serve more patients, perform more interventions, and drive better outcomes.

Shields is uniquely positioned to leverage pharmacist-led clinical interventions on behalf of its health system partners:

- Most Shields clinical pharmacists have advanced certifications (97% are CSP-certified), enabling rapid problem identification and resolution.
- The increased number of touchpoints in the Shields model also reduces time to problem identification.
- Pharmacy liaisons help to triage high-risk patients by conducting clinical screenings with each patient prior to every fill, forwarding answers that suggest risk to a pharmacist for further action.
- The strong relationships and trust that Shields builds with patients and providers increases the likelihood that the suggested clinical interventions will be accepted.
- Patients and providers are happy with the Shields approach; across the entire Shields network in 2024, provider satisfaction was 89.8 (Average Provider Score) and the patient Net Promoter Score was 82.7.

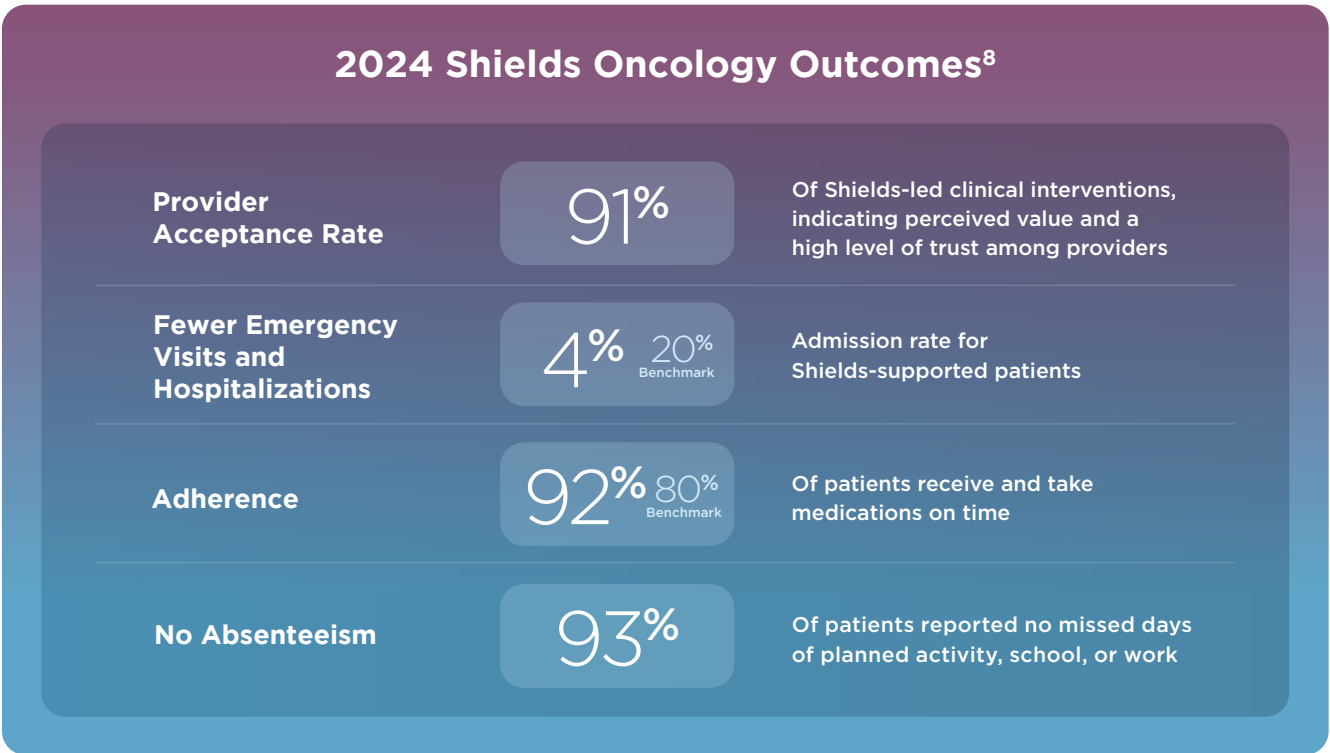
The Shields Oncology Patient Journey

Shields uses a proactive approach to manage patients on complex oncology medications with a carefully designed cadence of clinical pharmacist assessments. Patients receive at least two clinical pharmacist touchpoints within the first week of therapy. Clinical reassessments depend on patient-specific factors and medication risk, but on average, patients receive at least three and as many as 14 touchpoints annually, starting one week after therapy begins.



Demonstrated Success With Clinical Interventions

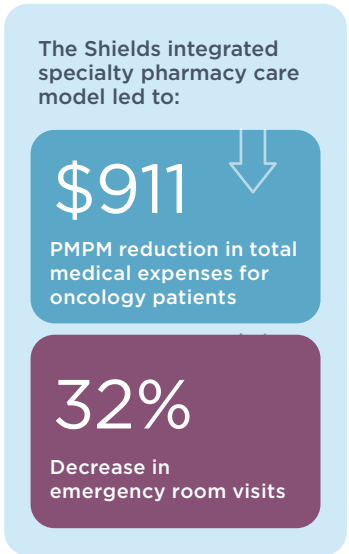
Shields tracks interventions across its partner health systems to measure against benchmarks and measure success over time. Among the information tracked are rates of absenteeism and adherence (measured by proportion of days covered), which are key to addressing care gaps, enabling timely interventions, and improving health outcomes. The methodology for cost avoidance determination was developed by an internal standard process that reflects clinical best practices, aligns with external standards, and references data published in the literature. When multiple costs are identified through review of references, the lower figure is utilized in calculating cost avoidance. Cost avoidance calculations are reviewed and updated regularly to align with recent literature. The cost avoidance calculated from associated pharmacist interventions supports the \$1200 per member per month savings in specialty patients who utilized an integrated specialty pharmacy.⁹



Demonstrated Cost Savings

In a joint analysis with Optum of Medicare Advantage patients, Shields found an overall 13% lower risk-adjusted cost of care among the integrated specialty pharmacy intervention group, as compared to the control group. In oncology, specifically, after normalizing for patient risk, the Per Member Per Month (PMPM) medical expense savings were \$911 (p<0.05), resulting from fewer hospital outpatient visits, fewer freestanding physician visits, and fewer ER visits. Annually, this translates to \$10,932 total cost-of-care savings per patient.⁷

In 2024, Shields pharmacist-led clinical interventions resulted in more than \$150 million in cost savings for partners across the Shields network. Shields pharmacy liaisons also helped patients secure financial assistance to reduce the out-of-pocket cost of medications. Network-wide, Shields helped patients access \$2.3 billion in financial assistance through patient assistance programs in 2024.



Patient Stories

“ Medication Reconciliation Prevents Regorafenib and Phenytoin Interaction

During an initial assessment for a patient with colon cancer scheduled to begin regorafenib, a Category X drug-drug interaction was identified between regorafenib and phenytoin, an anti-seizure medication. Although phenytoin was listed as a historical medication in the EMR, a full medication reconciliation performed by the pharmacist revealed that the patient was still taking phenytoin daily. The patient was advised to hold regorafenib therapy.

The oncologist subsequently transitioned the patient to levetiracetam for seizure control. Regorafenib was then initiated. This case underscores the importance of thorough medication reconciliation, interdisciplinary collaboration, and proactive patient engagement in preventing serious adverse drug interactions.

“ Pharmacist Alerts Provider to Capecitabine-Associated Cardiotoxicity

A patient undergoing treatment with capecitabine for approximately four days reported experiencing intermittent chest heaviness approximately one hour following each dose. The symptoms were self-limiting, resolving within 2–3 hours, and were not initially perceived by the patient as severe. However, given the temporal relationship to capecitabine administration, the symptoms were identified as a potential manifestation of capecitabine-induced cardiotoxicity.

The clinical pharmacist promptly communicated with the provider. Following this, the provider contacted the patient directly, discontinued capecitabine, and initiated an alternative therapeutic regimen. This case highlights the importance of early recognition and interdisciplinary communication in managing adverse drug reactions.

CONCLUSION

As Shields has demonstrated through its partnerships with major health systems, pharmacist-led interventions transform oncology care by improving outcomes and reducing costs. As a commonplace and costly therapeutic area, oncology is a particularly impactful starting point for health systems as they begin to implement or enhance clinical intervention programs.

Integrated specialty pharmacy programs incorporating pharmacist-led interventions provide a tangible, scalable solution for enhancing patient care, improving adherence, mitigating adverse effects, reducing the fragmentation of treatment, and reducing healthcare expenditures.

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ABOUT SHIELDS HEALTH SOLUTIONS

Shields Health Solutions (Shields) is the premier specialty pharmacy accelerator in the country. The Shields Performance Platform, an integrated set of solutions, services and technology, is intentionally designed to elevate payer and drug access for specialty pharmacies, elevate health outcomes for complex patients, and elevate growth throughout the entire health system. As the foremost experts in the health system specialty pharmacy industry, Shields has a proven track record of success including access to over 75 percent of all limited distribution drugs (LDDs) and most (health insurance) payers in the nation; and a clinical model proven to lower total cost of care by 13%. In partnership with more than 80 health systems across the country through national-scale collaboration, Shields has a vested interest in delivering measurable clinical and financial results for health systems.



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