Volume 32 • Issue 3S • April 2026 (Supplement)

**CAPhO Conference 2026 Abstract Book**

# JOURNAL OF ONCOLOGY PHARMACY PRACTICE

Official Publication of the International Society of Oncology Pharmacy Practitioners

CAPhO Canadian Association of Pharmacy in Oncology Association canadienne de pharmacie en oncologie ACPhO

journals.sagepub.com/home/opp
ISSN: 1078-1552

Mary Ann Liebert

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**CAPhO Conference 2026 Abstract Book**

**Abstracts**

JOURNAL OF ONCOLOGY PHARMACY PRACTICE

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J Oncol Pharm Practice
2026, Vol. 32(3S) 2–23

DOI: 10.1177/10781552261433745
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## Administration

### 1
### Cost Comparison of Pembrolizumab Infusions: Hospital Outpatient vs Private Infusion Clinics in Ontario

**Davidson Dalangin[1], Alan Birch[1]**
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**Objective:** To compare direct infusion delivery costs for pembrolizumab administered in hospital outpatient oncology clinics versus a private infusion setting in Ontario, with the aim of identifying cost efficiencies that support patient access and resource optimization.

**Background:** Pembrolizumab, an intravenous immunotherapy, is primarily administered in hospital outpatient oncology units where institutional overhead and staffing costs can drive up per-dose delivery expenses. Private infusion clinics have emerged as an alternative for non-chemotherapy oncology treatments, offering flexible scheduling and potential system-level savings. However, Canadian data comparing infusion costs across these settings remain limited. Pharmacists, as medication experts and care coordinators, play a critical role in evaluating delivery models, ensuring safe administration, and advocating cost-effective strategies that maintain quality and accessibility.

**Methods:** A retrospective cost analysis was conducted using real-world data in Ontario for patients receiving pembrolizumab in 2025. Hospital outpatient costs were sourced from standardized provincial data; private infusion clinic costs were obtained from an Ontario infusion provider. The analysis focused exclusively on infusion-related delivery costs, excluding drug acquisition and monitoring. Descriptive statistics and cost ratio calculations were applied to compare mean and median per-infusion costs and estimate potential savings. Pharmacist considerations included workflow implications, patient scheduling flexibility, and integration with supportive care services.

**Results:** Private infusion clinics demonstrated substantially lower direct delivery costs compared to hospital outpatient settings. The mean cost per infusion was $537.66 in hospitals versus $327.83 in private infusion clinics—a 39% reduction. When extrapolated across multiple treatment cycles, cumulative savings can be up to $7000 per patient per treatment course. These efficiencies may alleviate hospital resource pressures, reduce wait times, and improve patient access. By understanding these findings, pharmacists can advocate policy changes that enable private infusion clinic administration as an option for patient care, ensuring future models maintain safety, accessibility, and cost-effectiveness. Further analysis is underway to assess regional variability and applicability to other oncology therapies.

**Conclusion:** Private infusion clinics may offer a cost-efficient alternative for selected oncology treatments such as pembrolizumab, without compromising care quality. Pharmacists are uniquely positioned to champion sustainable infusion models, ensuring safety, continuity of care, and economic stewardship. Collaboration among hospitals, payers, and private providers will be essential to scale these models across provinces. Future research should evaluate quality metrics, patient satisfaction, and long-term system impacts to inform national oncology care strategies.

### 2
### Calculating the Real-World Incremental Cost-Effectiveness Ratio for Daratumumab in Combination with lenalidomide-Dexamethasone for the Second-Line Treatment of Relapsed Refractory Multiple Myeloma

**Jane De Lemos[1], Jelena Mucvic[1], Fiona Chen[2], Annie Zeng[2], Brandon Whitmore[3], Stuart Peacock[1], Christopher Venner[1]**
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**Introduction:** Daratumumab in combination with lenalidomide-dexamethasone (DRd) for second-line treatment of relapsed refractory multiple myeloma

(RRMM) was recommended for public funding in Canada in 2019. The Canadian Drug Agency (CDA) estimated incremental cost-effectiveness (ICER) of approximately $165K-$594K per quality adjusted life year (QALY) derived from the POLLUX trial results. While this modelled estimate informed price negotiation decisions, the real-world ICER has not been reported. Therefore, the value of daratumumab in real-world practice is uncertain. Such information may help inform future price negotiations in this treatment space and identify actual value achieved with daratumumab in this setting.

**Objective:** To calculate the real-world ICER associated with daratumumab for second-line treatment of RRMM in combination with lenalidomide-dexamethasone in a Canadian province.

**Methods:** We conducted a retrospective cohort study comparing patients treated with daratumumab-lenalidomide-dexamethasone (DRd) between February 1st 2019 to March 31st 2022 and patients treated with lenalidomide-dexamethasone (Rd) between July 1st 2014 to June 30th 2017.

Clinical outcomes, baseline characteristics: age, sex, refractory to first-line therapy, receipt of lenalidomide maintenance therapy, ECOG performance status, ISS, ISS-Revised, eGFR <60ml/min (all at diagnosis) and adverse events leading to treatment discontinuation were collected, with data censored at October 31,2023.

Descriptive cohort characteristics, unadjusted Kaplan-Meier estimates for PFS, 24-month PFS rates and overall survival (OS) are reported.

Further survival and economic analysis are on-going. To account for baseline differences between historical and contemporary cohorts, inverse probability of treatment weighting will be applied to the dataset, following multiple imputation of missing baseline covariates. Transition probabilities for progression free survival (PFS) and post-progression survival (PPS) will be derived from fitted parametric survival curves. Finally, a three-state (progression-free, progressive disease, death) Markov model with a 20-year horizon and monthly cycles, will be used to estimate life-years and QALYs.

**Results:** After exclusions, 248 patients received DRd and 232 received Rd. Median age (range) was 69 yrs (30-80) and 70 yrs (35-88) in DRd and Rd cohorts respectively. Baseline covariate missing data ranged from 4% (renal function) to 25% (ISS-R) and 53% (ECOG). During early calendar years of the historical cohort cytogenetic testing was not available for patients older than 70 yrs. Also in this cohort, 29% of initially missing ECOG performance status was imputed following scoring from contemporaneous medical notes.

In the DRd cohort, after a median follow-up of 25.7 months, median PFS was not reached (NR) with 46% of patients experiencing a progression or death event. Median OS was 38.97 months (95% CI 31.65-43.80). In the Rd cohort, with a median follow-up of 44 months, median PFS was 25.97 months (95% CI 20.1-35.4), median OS 36.97 months (95% CI 31.3-44.3). The 24-month PFS rates were 67.3% (95% CI 60.3-73.9) for DRd and 53.0% for Rd (95% CI 45.6%-60.0%). Treatment discontinuation due to an adverse drug event was 7.2% and 19.8% in DRd and Rd cohorts respectively.

**Conclusion:** For context, 24-month DRd PFS rates are similar to reported in the POLLUX trial (67.3% vs.70.3%) while for Rd, rates are higher (53.0% vs.45.0%). Final adjusted survival and economic analyses are on-going.

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## 3
## Description of Pharmacist On Call Service for the First Year at the Arthur J.E. Child Comprehensive Cancer Centre

**Frances Folkman[1], MIchelle Dowhan[2], Kyia Hynes[2], Patrick Yau[2], Nikki Blosser[2]**
*[1]Alberta Health Services, Calgary, Canada, [2]Cancer Care Alberta, Calgary, Canada*

**Introduction:** The Arthur J.E. Child Comprehensive Cancer Centre (AJECCC) opened with four inpatient units and a total of 94 beds in November 2024.

Pharmacists at AJECC have been on call since its opening.

**Objective:** To describe the first year of the pharmacist on call service at the AJECCC with respect to types and duration of calls, time of day and trends identified.

**Study design:** Retrospective review of pharmacist on call records from November 2024 to October 2025.

**Results:** A total of 177 calls were recorded from November 2024 to October 2025. Almost one third of calls occurred over the first 2 months. Eighty-four percent (148/177) could be managed by telephone consult, and 16% (29/177) required a return to the AJECCC site. The average pharmacist time per telephone call was 23 minutes, and the average time for being called in to the AJECCC was 81 minutes. There were 17.5 percent (31/177) of calls relating to clinical issues, 68.9% (122/177) involving medication supply questions, 6.8% (12/177) involving both clinical and supply issues and 6.8% (12/177) classified at "other reason for call". Most calls occurred prior to 10 pm (73.4% or 130/177).

**Discussion:** For the first year of pharmacist on call service at the AJECC, there were a total of 177 calls, with the majority of calls involving medication supply issues and most calls occurring prior to 10 pm.

**Conclusion:** The results provide a description of an acute care oncology pharmacy on call service for a centre with 94 inpatient beds.

## 4
## Mesna Utilization in Current Cancer Care Alberta Regimens versus Established Guidelines: A Cost-Minimization Analysis

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**Introduction/Objectives:** Ifosfamide is a cytotoxic antineoplastic agent associated with dose-dependent hemorrhagic cystitis (HC), mitigated by prophylactic mesna. Standard mesna dosing regimens substantially reduce HC incidence (1); however, mesna dosing at Cancer Care Alberta (CCA) currently exceeds established guideline recommendations without evidence for added clinical benefit (2-4), resulting in unclear financial and operational impacts.

The primary objective of this study was to quantify potential cost savings associated with aligning CCA mesna dosing with standard intravenous (IV) guideline recommendations. The secondary objective assessed further potential cost and chair time implications from transitioning CCA mesna dosing regimens to standard IV/oral regimens.

**Methods:** This retrospective chart review included patients $\geq$ 18 years old who received intermittent IV mesna for ifosfamide-induced HC prophylaxis across CCA sites between January 1, 2023, and December 31, 2024. Patients on continuous mesna infusions or already receiving guideline-concordant mesna dosing were excluded. Differences in drug utilization and chair time were estimated by comparing actual CCA doses and regimens to hypothetical standard IV and IV/oral dosing strategies. A cost-minimization analysis was then completed using Canadian drug market pricing alongside institutional administration time and nursing costs.

**Results:** Of 129 patients screened, 90 met inclusion criteria. Aligning current IV regimens with standard IV dosing yielded a median drug cost savings of $3,290.23 per patient, corresponding to a projected savings of $168,606.53 across CCA. However, this approach increased chair time by a median of 13.75 hours per patient, or a cumulative 877.7 hours for all outpatients across CCA. In contrast, transitioning to standard IV/oral dosing resulted in a median savings of $1187.29 per patient and $67,029.49 annually, while also reducing chair time by a median of 15 hours per patient, or a total of 1,098.8 hours across all CCA outpatients.

**Discussion:** The findings demonstrate that aligning the mesna dosing currently employed at CCA with guideline-concordant regimens offers meaningful reductions in drug costs, without evidence of clinically significant differences in outcomes. Beyond cost savings, reduced mesna utilization may support broader sustainability goals by decreasing unnecessary medication manufacturing and waste and potentially preventing drug shortages.

The analysis also highlights that standard IV-only dosing may increase chair time, whereas a standard combined IV/oral strategy offers a more balanced and operationally feasible approach to cost reduction. Prior studies have demonstrated comparable uroprotective efficacy between the two routes of administration, supporting the interchangeability of these strategies (5).

Due to its retrospective design and the assumption, based on existing evidence, of equivalent uroprotective efficacy between standard and higher-dose regimens, this study is subject to notable limitations. Nevertheless, it leverages

local utilization data and patient-important outcomes to support pragmatic protocol optimization across CCA. The methodology may also serve as a framework for other institutions evaluating the economic and operational impact of their current dosing practices.

**Conclusion:** Current CCA mesna regimens are more costly than standard protocols and expose patients to higher-than-recommended cumulative mesna doses, supporting protocol revision toward guideline-concordant dosing strategies.

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## 5

## Turning Insight into Action: How a Collaborative Review of BC Cancer's Serious Adverse Drug Reaction (ADR) Reporting Process for Health Canada Led to Enhanced Patient Support


**Tonya Ng[1], Stephanie Woo[1], Anika Patel[1], Megan Crosby[1], Hamze Jomaa[2], Susan Ellard[1], Brandon Bernard[1], Alison Pow[1], Yuna Jang[1], Anne Tremblay[1], Darren Frew[3], Hilary Horlock[3], Stephanie Townsend[1]**

*[1]BC Cancer, Canada, [2]Provincial Health Services Authority, Canada, [3]Patient Partner, Canada*


**Background:** This quality improvement (QI) project was part of a continued plan-do-study-act (PDSA) cycle to support serious adverse drug reaction (ADR) documentation and reporting. Organizational policies and federal legislation stipulate serious ADRs must be documented in a patient's chart and reported to Health Canada. Previous QI work highlighted unclear serious ADR-related definitions, documenting and reporting requirements, plus unmet patient communication needs as challenges (1).

**Objectives:** 1) Clarify discrepancies relating to ADR documenting and reporting workflows; 2) Develop and implement ADR documenting, reporting, nursing follow-up protocols to address previously identified concerns; 3) Review protocol implementations and determine whether protocols require further clarity.

**Methods:** PDSA cycle: 1) Formed working group to clarify gaps identified from the previous ADR PDSA cycle, and create serious ADR documentation, reporting and follow-up protocols; 2) Conducted a retrospective chart review of serious ADRs reported through Patient Safety Learning System (PSLS) to evaluate protocol implementation 6 months post-launch (Feb to July 2025); 3) Reviewed results with patient partners, Medication Safety Subcommittee, Professional Practice Nursing; 4) Reported to Systemic Therapy Program.

**Results:**

1. Working group: i) clarified differences between health record documentation and Health Canada reporting requirements; ii) defined practical discipline-specific documentation and reporting responsibilities based on clinical workflows; iii) identified separate documentation workflows for infusion and non-infusion reactions; iv) developed a patient telephone follow-up process for grade 3-4 infusion reactions.
2. Review: In the first three months, 3 serious ADRs were reported, which was lower than expected. Leadership explored causes and identified change management needs. Serious ADR reporting improved by the fourth month. Overall, ADRs were reported for 25 patients and reviewed in the 6 months post-protocol launch. 80% (20/25) were infusion-related reactions. Most key requirements were documented correctly (85%, 17/20). 80% (8/10) of patients, who required a follow-up call, received a phone call within 48 hours.
3. Sharing results: i) provided leadership with positive feedback to share with frontline staff, alongside clarifications to further support staff; ii) generated discussion on strategies to improve ADR reporting, leading to new relationships with other teams engaged with ADR-related QI work.

**Conclusion:** The new ADR protocols improved documentation and patient support 48 hours post-infusion reaction, compared to the previous PDSA cycle findings. While overall ADR reporting remained low, ADR reporting improved with frequent assessment and leadership engagement to support ongoing change management needs. Subsequent sharing of the QI project results facilitated new collaboration opportunities to better identify the incidence of serious ADRs in our oncology patients.

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## Pharmacy Practice (Non-Research Based)

### 6
### Measuring Inpatient Clinical Pharmacy Workload in a Tertiary Comprehensive Cancer Centre

**Nikki Blosser[1], Kyia Hynes[1], Michelle Dowhan[1], Jodi Delday[1], Kristine Ferguson[1], Frances Folkman[1]**
*[1]Arthur Child Cancer Centre, Calgary, Canada*

**Background:** In November 2024, four inpatient units at Arthur Child Cancer Centre (ACCC) were opened and serviced by Intensive Palliative Care (IPCU), Hematology, BMT and Medical Oncology/Radiation Oncology (MO/RO) teams. The number of beds on each unit ranged from 22-25, with two units shared by IPCU and MO/RO services, and the other two units shared by hematology and BMT services. A total of 4.0 FTE was funded for inpatient clinical pharmacy services with 1.0 FTE assigned to each service. The AHS Pharmacy Service Inpatient Clinical Practice Model indicates the target ratio for patients on oncology, hematology and BMT services is 1.0 FTE for every 10-15 patients to provide integrative care. Due to the high ratio and complexity of patients, clinical pharmacists on the hematology service developed a triage system to prioritize patients, assigning patients a category of 1-3 (with 1 being highest acuity and 3 not requiring further pharmacist follow-up). This triage system was implemented on a trial basis for all services in February 2025, with the plan to collect data on pharmacist workload based on the triage system classification.

**Objectives:** This project aimed to describe the workload of the inpatient clinical pharmacy teams. It also evaluated the utility of the triage system in helping pharmacists prioritize patients and aimed to identify gaps in clinical pharmacy services.

**Methods:** Data related to unit census, admissions, and patient acuity was prospectively recorded by inpatient clinical pharmacists at ACCC during February 2025. Pharmacy Clinical Practice Leaders obtained workload data from the iVent system within the Epic EMR.

**Results:** IPCU had the lowest mean number of patients per day at 15 (range 10-19), while MO/RO had the highest at 26 (18-45). Hematology and BMT were comparable at 22 (17-28) and 22 (19-27), respectively. The number of admissions followed a similar trend with IPCU noting 5-10 new admissions per week, whereas MO/RO recorded 5-35 new weekly admissions. With respect to workload, pharmacists covering hematology, BMT and MO/RO services, on average, recorded a minimum of 75% of a full shift (5.8 hours), whereas the average clinical time recorded on the IPCU service was lower (3.9 hours). While the percentage of patients in triage Category 1, 2, 3 varied for hematology (65, 27, 8) and MO/RO (59, 28, 13) services, all patients on the BMT and IPCU services were in Category 1 or 2.

**Discussion:** IPCU tends to fit the target ratio of 10-15 beds per 1 FTE, whereas the other services had patient: pharmacist ratios that were above this target, making it challenging to provide integrative care with current FTE. Categorization of patients using the triage system allowed prioritization of patients on the hematology and MO/RO services, but there was less variety of acuity in BMT and IPCU.

**Conclusion:** Based on workload, patient numbers and new admissions, the MO/RO service should be prioritized for additional clinical FTE, followed by BMT and hematology. While the triage tool is effective for hematology and MO/RO services, another way to prioritize patients should be investigated for BMT and IPCU.

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### 7
### Optimizing Booking Times for the Treatments in the Outpatient Oncology Clinic

**Sabiha Delawala[1], Lindsay Greaves[1]**
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**Background:** The Outpatient Oncology Clinic has faced significant operational challenges due to the increasing complexity of oncology treatments and rising patient volumes. An important factor contributing to inefficiencies was the inconsistency and misalignment of treatment booking times with Cancer Care Ontario (CCO) standards. This misalignment led to prolonged patient wait times, suboptimal chair utilization, increased staff workload, and unnecessary clinical resource consumption. To address these issues, a quality improvement initiative was launched at William Osler Health System's outpatient oncology clinic to standardize booking practices and enhance workflow efficiency.

**Aim:** The primary objective of the initiative was to align treatment booking times with CCO standards. This alignment aimed to improve overall operational efficiency, enhance the patient experience, and optimize resource utilization. Success metrics included an increase in the number of treatment bookings per day, improved chair turnover and utilization, and reduced patient wait times.

**Methods:** A multidisciplinary quality improvement (QI) approach was adopted, incorporating several key steps:

- Gemba walks were conducted to observe the real-time booking and treatment processes.
- A Fishbone Analysis was utilized to identify the root causes of misaligned booking times, such as workflow variation, technological barriers, and staffing patterns.
- Plan-Do-Study-Act (PDSA) cycles were implemented to test and refine standardized booking tools and workflows continuously.
- Comprehensive engagement with key stakeholders —including nursing, pharmacy, clerical teams, and leadership guided the design and implementation process. Booking protocols were developed in accordance with CCO recommendations and were rolled out in a phased manner (Phases 1–5). Throughout the project, weekly huddles and continuous feedback loops ensured responsiveness to frontline insights and operational constraints.

**Results:** The implementation of the first four phases resulted in measurable improvements in the clinic's performance. The average monthly number of treatment bookings increased by approximately 20%, rising from 1,473 in the 2022–2023 period to 1,763 in the 2024–2025 period. Alongside these quantitative improvements, the clinic also reported qualitative enhancements, such as improved chair turnover and utilization, better resource management, and reduced patient wait times.

**Discussion**The initiative will move forward with Phase 5, which involves interdisciplinary planning, further refinement of protocols, and ongoing evaluation of resource requirements to maintain the increased treatment volumes. Continuous monitoring and adjustments will be essential to ensure that the system adapts to evolving patient and operational demands.

**Conclusion:** The standardization of treatment booking times, achieved through a structured, multidisciplinary quality improvement approach, led to significant operational gains in the Outpatient Oncology Clinic. By aligning booking practices with CCO standards, the initiative improved treatment capacity, optimized chair utilization, increased staff efficiency, and enhanced the overall patient experience. Ongoing iterative improvements will be crucial to sustaining adaptability and meeting future increases in patient volume.

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## 8
## Establishing a Pharmacist-Led Post-Transplant Re-Immunization Clinic

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*[1]The Ottawa Hospital, Ottawa, Canada*

**Introduction:** Hematopoietic cell transplant (HCT) patients require re-immunization post-transplant to regain immunity and protect against vaccine-preventable illnesses.

Prior to this project, re-immunization post-HCT at The Ottawa Hospital (TOH) relied on paper logs and manual tracking, without involvement of a pharmacist. Vaccination records in the EPIC electronic medical system (EMR) were limited, restricting the ability to confirm administration, monitor safety, and evaluate the program. Vaccine funding eligibility was not reviewed prior to administration, resulting in additional cost to TOH for any non-publicly funded vaccinations.

In September 2025, the TOH Transplantation and Cellular Therapy (TCT) program finalized an updated policy and schedule for re-immunization of TCT patients.

**Objective:** To develop a standardized post-HCT re-immunization process, utilizing TCT-trained pharmacists for vaccine ordering, assessment of funding and eligibility, and patient education.

**Methods:** It was identified that specialized TCT pharmacists would be essential in aligning TOH processes with the updated re-immunization policy. A medical directive was developed to authorize vaccine prescribing by TCT pharmacists. Required workflow components included EPIC EMR-based identification of eligible patients using ambulatory referrals, standardized therapy plans to support vaccine ordering and scheduling, and structured documentation templates. Educational resources for patients and nursing were also developed to support delivery of the program.

**Results :** Through an internal TOH grant, 0.1 FTE pharmacist time was obtained to fund this project.

Patients are referred through the new ambulatory referral in EPIC EMR. Two therapy plans were produced (months 0-12 for inactivated vaccines and 18-20 for live vaccines), which include vaccine orders, appointment requests, infectious serologies, and prescriptions for non-publicly funded immunizations. Using the medical directive, pharmacists order the therapy plan, which allows for confirmation of re-immunization eligibility and funding criteria. TCT pharmacists developed pharmacy-specific EMR tools, including patient tracking lists, reminder systems, and standardized documentation templates. Pharmacists also developed patient education sheets and provided in-person counseling during the first visit. Since subsequent visits are managed by nursing staff, pharmacists offer nursing education to ensure consistent understanding of the processes, documentation requirements, and vaccine handling.

**Conclusion:** Implementation of a pharmacist-led post-transplant re-immunization clinic will standardize care at TOH. EPIC EMR supports vaccine review, safety monitoring, and program evaluation, with expected benefits including enhanced monitoring, improved patient education, and reduced institutional costs.

## 9
## Auditing Outpatient Antibiotic Prescriptions from Oncology Clinics: A Quality Improvement Project

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**Background:** Oncology patients are at increased risk of infection due to treatment-related immunosuppression. Previous projects have demonstrated high rates of antibiotic prescribing in our ambulatory oncology population; however, antibiotic appropriateness has not been systematically assessed. Inappropriate prescribing contributes to antimicrobial resistance and adverse patient outcomes, underscoring the need to evaluate feasible methods for assessing antibiotic appropriateness in ambulatory oncology practice.

**Objectives:** 1a) To describe user experience with a structured antibiotic auditing process in the outpatient oncology setting; 1b) To assess its potential integration into routine antimicrobial stewardship (AMS) work; 2) To evaluate the appropriateness of outpatient antibiotic prescriptions at BC Cancer Prince George.

**Methods:** This mixed-methods quality improvement project represents an initial Plan-Do-Study-Act (PDSA) cycle to assess the proposed auditing process.

Part 1 – Retrospective descriptive analysis: A single reviewer evaluated outpatient antibiotic prescriptions issued at BC Cancer Prince George between October 1, 2024, and January 31, 2025. Prescriptions were evaluated for appropriateness with respect to indication, dose, frequency, duration, and contraindications using a standardized auditing process informed by a hierarchical review of local and international guidelines and resources.

Part 2 – User experience assessment: User experience and reflections on the audit process were documented through user log entries and a subsequent open-ended questionnaire. Data were analyzed using thematic analysis focusing on usability and feasibility to assess the role of the auditing process within the AMS program.

**Results:** Part 1: Among the 56 prescriptions reviewed, 96.4% (54/56) were prescribed empirically, and 3.6% (2/56) prescribed in response to culture results. Overall, 44.6% (25/56) were appropriate, 53.6% (30/56) were inappropriate, and 1.8% (1/56) were unable to be assessed. Among the inappropriate prescriptions, the most common indications were urinary tract infections (UTIs) (26.7%, 8/30) and lower respiratory tract infections (LRTIs) (26.7%, 8/30). For UTIs, reasons for inappropriateness included inappropriate antibiotic selection (100%, 8/8) and duration (87.5%, 7/8). For LRTIs, inappropriate antibiotic selection (100%, 8/8) and duration (50.0%, 4/8) were also most common.

Part 2: Three themes emerged: 1) The audit process was resource-intensive, with time and labour burden amplified

by limited infectious diseases expertise, documentation insufficiencies, and extensive guideline verbiage; 2) Guideline rigidity limited applicability in the context of clinically complex oncology patients; 3) Gaps and discrepancies across guidelines complicated appropriateness assessments. Despite being resource-intensive, this process was valuable in identifying less apparent inappropriate prescribing patterns, including guideline deviations beyond broad-spectrum antibiotic use.

**Conclusion:** Over half of outpatient oncology antibiotic prescriptions were inappropriate, primarily due to antibiotic selection and duration, highlighting clear opportunities for AMS intervention. Although the structured audit process provides a standardized framework, its feasibility for routine use is limited by operational capacity, documentation quality, and limitations of existing guidelines. Nonetheless, this approach was valuable in highlighting less obvious inappropriate prescribing patterns to inform prioritization of future AMS initiatives. Next steps include reviewing results with prescribers and exploring the role of oncology-specific infectious diseases guidelines to better support outpatient oncology AMS initiatives. For future audits, we may adopt a more focused approach, targeting inappropriate prescribing trends identified from this PDSA cycle.

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## 10
## Beyond Irritant, Not Quite Vesicant? Irritant with Vesicant Properties: An Updated Approach to Extravasation Hazard Classification

**Amy Lim[1], Nadine Badry[1], Mario de Lemos[1]**
*[1]BC Cancer, Vancouver, Canada*

**Introduction/Objectives:** Intravenous oncology drugs are traditionally classified by their extravasation hazard as "vesicant", "irritant", or "none" (non-irritant/non-vesicant). However, this classification does not adequately capture irritant drugs that have been reported to cause tissue damage in rare cases, leading to uncertainty and inconsistent guidance for extravasation risk management. Some guidelines have introduced an additional category, "irritant with vesicant properties", but it is poorly defined. This review aims to clearly define "irritant with vesicant properties" by developing classification criteria and to refine the definitions of existing extravasation hazard categories at BC Cancer.

**Methods:** Definitions and classification from existing BC Cancer extravasation guidelines were compared with major oncology practice guidelines (ASCO/ONS, ESMO/EONS, NHS, NSW/eviQ). Drugs classified as irritants with vesicant properties were identified, and their extravasation data were evaluated for the severity and likelihood of tissue damage. A literature search was conducted using MEDLINE, CINAHL, PubMed, and Google scholar with search terms extravasation, vesicant, necrosis, and individual drug names. Additional data sources included product monographs and post-marketing reports. Clinical data were used to define of the new category, "irritant with vesicant properties" and develop its classification criteria, as well as refine the definitions of existing extravasation categories.

**Results:** There was no standard definition of "irritant with vesicant properties" and wide variability existed between drugs included in this category. Based on the reported tissue damage, we defined "irritant with vesicant properties" as a drug that typically behaves as irritant (i.e., causes burning sensation or pain) but in rare cases may cause tissue damage following extravasation. Tissue damage ranged from superficial injury (e.g., exfoliation, blistering) to necrosis. Two key criteria were developed to distinguish "irritant with vesicant properties" from "vesicant": (1) low potential to cause tissue necrosis, based on rare and inconsistent reports of necrosis or (2) low likelihood of serious complications following extravasation, based on reports of damage limited to superficial tissue (e.g., blistering or exfoliation) only, with no reports of necrosis. Absence of reported tissue damage was used as the key criterion to distinguish "irritant" from "irritant with vesicant properties". No major changes were required to the definition of "none" category.

**Discussion:** We have established a clear definition of "irritant with vesicant properties" by developing

classification criteria supported by clinical reports on the severity and likelihood of tissue damage following extravasation. The updated criteria reduce the uncertainty and inconsistency of extravasation risk management. This classification can guide reclassification of existing drugs and evaluation of emerging oncology drugs. A limitation of this review is that the updated criteria have not yet been applied to all existing vesicants and irritants; this validation is currently underway at BC Cancer.

**Conclusion:** A new category, "irritant with vesicant properties," has been developed with clear delineation from the "vesicant" and "irritant" categories. The updated classification can better support the development of extravasation prevention and management policies and enhance the safe administration of intravenous oncology drugs.

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## 11

## Navigating Funding and Establishing Coverage for Oral Anticancer Medications in Ontario: How Long till I Get My Drug

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**Introduction/Objectives:** Oral anticancer medications (OAMs) are a rapidly expanding group of therapies becoming the standard of care for several cancer types, but are associated with high drug costs. OAMs are listed on formularies based on recommendations from Canada's Drug Agency (CDA), often requiring the patient to meet clinical criteria for funding eligibility. In Ontario, OAMs are funded through a mix of public drug programs (e.g. Ontario Drug Benefit, "ODB"), private plans, and manufacturer-sponsored patient assistance programs. Ontario does not have universal public drug funding for OAMs, requiring some patients to apply for ODB via the Trillium Drug program. This mix of payers, plus administrative applications and processing times, contributes to challenges in ensuring timely access to OAMs for cancer patients. The process is coordinated by oncologists, pharmacy personnel, drug access navigators (DANs) and the patient. The objective of this pilot study is to create a baseline data set describing the time to establish OAM coverage (TEC) for patients at an academic cancer Centre in Ontario.

**Methods:** This was a retrospective study to determine the TEC for OAMs as part of a larger continuous quality improvement project. We documented the timeline from intent-to-treat (date medication requested by prescriber) to the date coverage was established, capturing the period from December 15, 2025 to January 21, 2026. We logged requests for medications requiring special access (not listed on general formularies), and retrospectively gathered descriptive characteristics. We used the Mann-Whitney U test (two-sided alpha=0.05) to test for factors associated with longer times to coverage ascertainment.

**Results:** We analyzed 38 medication referrals ("cases"). At baseline, 58% of cases had public drug funding, 10% of which were via Trillium, and 8% had no drug insurance. The median TEC was 16 days (range 0 – 159 days). Once coverage was established, 74% of cases had public coverage, with 29% accessing via Trillium. The median TEC was significantly longer for those cases involving Trillium (26 days, p=0.01). A DAN was involved in 71% of cases. Two or more payers for drug coverage were required for over 47% of cases, and 45% of cases required enrolment in a compassionate/patient support program.

**Discussion:** Due to the high cost of OAMs, the initiation of OAM therapy depends upon coordinating funding. Despite having target treatment start timeframes set by the Ministry of Health for parenteral systemic therapies, no such targets exist for OAMs. The process of securing public drug coverage via Trillium requires additional

processing time. Thus, Ontario Cancer Centres should consider proactive measures to secure OAM funding as the use of these medications continues to increase.

**Conclusion:** Coordinating drug coverage for OAMs is a complex process, requiring advance lead time and the assistance of multiple parties to investigate and ensure drug funding. The next phase of this study is to examine each step of the process and evaluate factors that impact TEC, so that oncology teams can work to improve this metric.

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## 12
## Pharmacist Impact on Patients Initiating Multiple Myeloma Therapy

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**Introduction:** Oral therapies have improved overall survival for patients with multiple myeloma (MM) in recent decades, and MM can be considered a chronic disease (1). Most MM care is delivered in the outpatient setting, requiring patients and care partners to assume greater responsibility for disease and often complex medication management. In the community setting, specialized oncology pharmacies can offer early pharmacist involvement through prescription verification, medication review, and patient counselling. At treatment start, pharmacists with expertise in myeloma can identify drug therapy problems (DTPs) early and make necessary interventions. In 2021, 14 ambulatory oncology clinical pharmacy key performance indicators (AOcpKPIs) were identified by Canadian oncology pharmacist expert consensus as evidence-based services that oncology pharmacists perform that impact patient care and outcomes in the outpatient setting (2). The study objective was to describe the impact of early pharmacist involvement for patients starting MM therapy by measuring of DTPs and AOcpKPIs identified during the initial patient interaction.

**Methods:** A retrospective descriptive cohort study was conducted in a specialized community oncology pharmacy. Patients with MM initiated on lenalidomide, pomalidomide, or selinexor between April 28, 2025 and September 5, 2025 were included. Standardized pharmacist documentation was reviewed, and data were extracted by co-investigators. Outcomes measured were: 1) Number of DTPs and AOcpKPIs identified during initial patient interaction, patient counseling and follow up (cycle 2); 2) Mean DTP and mean AOcpKPIs identified per initial dispense, patient counseling, and follow up (cycle 2); and 3) Types of DTPs and AOcpKPIs were also categorized. Data were de-identified and analyzed using Microsoft Excel.

**Results:** A total of 29 patients (mean age 68.9 ± 10.2 years) and 136 pharmacist–patient interactions were included. Across the study period, pharmacists identified and resolved 173 DTPs and documented 549 AOcpKPIs. During initial interactions up to cycle 1 dispense, a mean of 2.84 DTPs and 8.15 AOcpKPIs per patient were identified. At the first follow-up (cycle 2), a mean of 1.17 DTPs and 4.00 AOcpKPIs per patient were identified. Adverse drug reactions were the most commonly identified DTP across all encounters. The most frequently documented AOcpKPI was medication education. The mean pharmacist time required for assessments during initial dispensing was 45.7 minutes per encounter.

**Discussion:** Early pharmacist involvement in MM therapy initiation resulted in identification of a substantial number of DTPs and delivery of multiple evidence-based clinical services aligned with AOcpKPIs. The higher frequency of interventions during initial encounters reflects the importance of comprehensive assessments prior to therapy initiation. The mean pharmacist time for the initial dispense highlights the time investment associated with comprehensive therapy initiation. These findings support the value of specialized oncology pharmacists in enhancing medication safety and quality of care in the community setting.

**Conclusion:** Specialized community oncology pharmacists provide meaningful clinical contributions during initiation of oral MM therapy by identifying and resolving DTPs and delivering AOcpKI-aligned services. Early pharmacist assessment should be integrated into outpatient MM care models to optimize therapy safety and patient outcomes.

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## 13
## Impact of Expanding the Pharmacy Technician Role during Take-Home Cancer Drug Initiation in a Specialty Ambulatory Oncology Pharmacy

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**Introduction/Objectives:** Pharmacy technicians are regulated health care professionals in Ontario who work with pharmacists in providing patient care (1). As health care systems face increasing resource constraints, optimizing pharmacy technician roles may improve pharmacy practice efficiency and enable pharmacists to increase their focus on drug therapy optimization and health management. This project evaluated the impact of pharmacy technician–led onboarding during initiation of take-home cancer drugs (THCDs) in a specialty ambulatory oncology pharmacy. The primary objective was to quantify the time for technician THCD onboarding service provision. The secondary objective was to describe drug–drug interactions (DDIs) identified during pharmacist clinical assessments.

**Methods:** Study population consists of patients who were filling a THCD prescription at the specialty oncology pharmacy over a 2-month period from Dec 8, 2025, to Feb 8, 2026. The primary outcome was to report the mean time to complete the onboarding process. The secondary outcomes were: 1) Mean time of individual components including setting up a patient profile, onboarding phone call with patient, and communication with the respective community pharmacy, 2) Total number of DDIs with THCD identified requiring intervention and DDIs requiring monitoring/education, 3) Types of DDIs identified, and 4) Incidence of patients who had a DDI identified with THCD. Data was de-identified and managed in Microsoft Excel.

**Results:** A total of 137 patients were included in the study. The mean time to complete the onboarding process was approximately 44 minutes. The mean time to set up the patient's pharmacy profile was approximately 18 minutes, mean time for technicians to complete the onboarding phone call with the patient was approximately 24 minutes, and a mean time of approximately 3 minutes to communicate with the community pharmacy. Ninety-three patients prescribed a THCD for a medical oncology indication, were included for DDI assessment. Of the 93 patients, 12 DDIs requiring intervention and 104 total DDIs were identified, with the most common DDI type as risk of increased/decreased effect of THCD. The incidence of patients who had a DDI identified with their THCD during the onboarding process was 0.65 (60/93).

**Discussion:** With dedicated time, pharmacists identified a meaningful proportion of patients who were at risk of experiencing a DDI at THCD initiation. Integrating pharmacy technicians reliably into the new THCD treatment start workflow may enable time for pharmacists to focus on other clinical activities to support patient care and safety. Pharmacy technicians can effectively support the onboarding process for patients starting new THCDs and serve as a scalable solution to help deliver oncology patient care in a resource-stretched health system.

**Conclusion:** Pharmacy technicians are integral professionals within health and pharmacy care delivery. Overall, it appears that optimizing the roles of pharmacy technicians can support timely patient care provision and enable pharmacists to prioritize clinical assessments for oncology patients. Pharmacy technicians and pharmacists can collaboratively increase the overall value of safety of patient care provided at the initiation of THCD treatment.

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## 14
## A Multicenter, Feasibility Study Exploring Self-Administration of Chemotherapy in the Home Environment: the EASE Study

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**Introduction:** Multiple myeloma (MM) is a clonal malignancy of plasma cells resulting in excess monoclonal immunoglobulin production causing end organ damage including renal dysfunction, anemia, and lytic bone lesions (1). A common therapy for MM is bortezomib - the first in class proteosome inhibitor (1). Originally used as a single agent in patients with relapsed/refractory myeloma, it is now more commonly used in combination with other therapies including induction regimens to enhance efficacy (1). While numerous studies have investigated the feasibility of home administration of bortezomib by nurses for the management of multiple myeloma. However, the impact of patient self-administration remains largely unexplored. The objective of this study was to evaluate the impact and feasibility of patient self-administration of subcutaneous bortezomib.

**Methods:** This prospective feasibility study was conducted at the Cross Cancer Institute, Edmonton, Alberta and the Tom Baker Cancer Centre / Arthur Child Cancer Centre, Calgary, Alberta between May 2020 and May 2025. Patients were provided an educational intervention by a clinical research nurse. This involved education and observation to ensure safe self-injection by patient and/or caregiver. Doses of bortezomib were provided to the patient or caregiver prior to their scheduled teaching appointments (in the systemic therapy area). Standardized nursing and/or pharmacy teaching interventions for administration of subcutaneous medications (e.g., filgrastim) were used.

MM assessments were completed as standard of care by the attending physician and team. at each evaluation, grade 3 or higher adverse events attributable to patient self administration were assessed per the NCI Common Toxicity Criteria (CTCAE) Version 5.0 and serious adverse events were assessed using the ICH definition (2).

Patient and caregiver satisfaction were assessed using validated questionnaires administered at monthly intervals using the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-MY20 questionnaire, the Functional Assessment of Chronic Illness Therapy Treatment Satisfaction and Patient Satisfaction (FACIT-TS-PS) questionnaire, and the Caregiver Quality of Life – Cancer (CQOLC) survey. An analysis of both direct system and indirect patient costs was also conducted (3-5).

**Results:** Thirty-four patients received 1194 doses of bortezomib for self-administration over the study period. Patient self-administration was determined to have minimal impact of treatment efficacy, and with only 8 grade 3 higher adverse events occurring, there was no effect on safety since none were due to patient self administration. Patient satisfaction with the intervention was highly rated with 99% of responses indicating that the patient would choose this clinic again. Caregiver quality of life remained stable for the duration of the intervention. Institutional cost savings totaled an estimated 1,800,000 $CAD over the trial period, while patients collectively saved an estimated 23,000 $CAD.

**Conclusion:** Patient self-administration of bortezomib is efficacious, safe, cost effective, and was well received by both patients and caregivers. Furthermore, it was cost saving to both the system and patients. The option for patient self-administration of bortezomib should be considered for the standard of care for eligible patients on bortezomib who wish to self manage this aspect of their care.

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## 15
## Elimination of Premedications with Isatuximab Rapid Infusion

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**Objective:** Examine the feasibility and safety of eliminating premedications with isatuximab rapid infusion after patient tolerates 4 consecutive treatments without an infusion reaction.

**Design:** Isatuximab infusions usually require ongoing premedication with an H2 antagonist, acetaminophen and antihistamine administered 15 to 60 minutes prior to starting isatuximab to prevent infusion-related reactions with slow and rapid infusions. On August 1st, 2025, we implemented isatuximab rapid infusion (infusion rate of 500mL/hr) following Cancer Care Manitoba's approach. For new patients, first 2 doses were administered at a slow titrating infusion schedule (up to 150mL/hr with first infusion and 200mL/hr with second infusion). Rapid infusion was then initiated at the 3rd dose (provided previous doses tolerated). Existing patients transitioned to rapid infusion with their next scheduled dose. At the same time, we took the opportunity to implement the removal of our standard isatuximab oral premedications of famotidine 40mg, acetaminophen 1000mg and cetirizine 20mg after 4 consecutive infusions without any reactions. Existing patients had to tolerate 4 consecutive isatuximab rapid infusions before premedications were removed.

**Results:** From August 1, 2025, to December 31, 2025, we have administered 120 doses of isatuximab involving 12 patients, with approximately 100 doses administered at the rapid infusion rate. Only one grade 2 reaction has been reported. Patient reacted with dose number one on the isatuximab/carfilzomib/dexamethasone protocol but was able to transition to rapid infusion with the removal of premedication without issues. Data analysis ongoing with the addition of January and February treatments planned.

**Discussion:** Eliminating premedications with rapid infusion isatuximab, after 4 consecutive doses with no reactions, is feasible. No safety flags were raised with our approach. This reduces drug exposure for the patient and will assist with chemo suite resources, eliminating the time required to administer premedications and the wait time required before initiating isatuximab infusions.

**Conclusion:** As outlined above, a premedication de-escalation strategy is safe to implement for rapid infusion isatuximab. This experience could help guide the premedication approach for any future subcutaneous formulations, as subcutaneous formats usually have lower rates of reactions compared to their IV counterparts. We hope this will also provide consideration for the need of ongoing premedication with other monoclonal antibodies where the infusion reaction is not believed to be IgE mediated.

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## 16
## Using a Provincial Quality Improvement Audit to Strengthen Safe Systemic Cancer Treatment Delivery Practices in Ontario

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**Introduction/Objectives:** Safe systemic cancer treatment administration plays an important role in reducing preventable harm and supporting consistent care across Ontario's regional cancer system. Ontario Health (Cancer Care Ontario) (OH-CCO) became aware of potential gaps in safety standards following concerns raised by a systemic treatment facility during a planned observation session. This project describes the subsequent provincial systemic treatment safety audit conducted across all Ontario systemic treatment facilities. It highlights existing strengths and identifies opportunities in practice that systemic treatment facilities across Canada can reflect on when planning targeted quality improvement (QI) initiatives.

**Methods:** A multi-center, cross-sectional audit was conducted in 76 systemic treatment facilities using a standardized assessment checklist covering verification, preparation, transportation and administration processes. The checklist incorporated OH-CCO's systemic treatment standards and nursing competency tools, and was applied through onsite observation, document review, and interviews with pharmacy and nursing teams. All facilities either completed the checklist or received an OH-approved exemption based on comparable local

audits. The methodology was grounded in the PDSA framework.1-4 Descriptive statistics were used to analyze provincial results and by facility level. Requested facilities submitted minor or major improvement plans that were thematically analyzed.

**Results:** Of 76 systemic treatment facilities, 57 (75.0%) completed the assessment checklist and 19 (25.0%) were exempted. Among non-exempt facilities, overall compliance was high for many administration safety processes, with average "Yes" responses of 92.1% in cancer centers and 94.0% in partner sites, and 100% "Yes" for several critical administration checks, including verification of orders, lab parameters, and monitoring during infusion. The highest "No" response rates clustered around hazardous drug transportation, personal protective equipment (PPE) use, hazardous waste management, pump programming double checks, and systemic treatment labelling. Thematic analysis of facility comments highlighted inconsistent PPE use, variable implementation of rigid leak-proof containers and plastic-backed cloths for transport, incomplete cytotoxic labelling, and operational barriers to performing independent double checks of volumetric pump programming.

**Discussion:** The audit identified a reassuring level of adherence to core systemic treatment administration safety processes, particularly around patient identification, order verification and monitoring, but revealed system-wide gaps in hazardous drug handling and independent double checks. Many deficiencies reflected operational or environmental constraints (physical layout, bin design, or staffing models) rather than lack of awareness, underscoring the need for context-sensitive QI interventions rather than purely educational strategies. Facility-submitted improvement plans focused on standardizing PPE expectations, redesigning transport workflows and containers, optimizing waste receptacles, updating labelling in alignment with best practice and strengthening nursing double-check processes.

**Conclusion:** A province-wide QI audit using a PDSA framework successfully characterized systemic treatment safety practices and prioritized actionable gaps across systemic treatment facilities. Key recommendations include guidance and tools to standardize hazardous drug transportation and spill preparedness; reinforcement of PPE and waste-disposal policies; support for implementing robust, feasible independent double-check processes; and alignment of electronic and printed labels with cytotoxic and TALLman requirements. Embedding repeat audits and monitoring into routine practice at facility levels will be essential to sustain improvements.

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## 17
## Outpatient Oncology Antibiotic Review: A Continuous Quality Improvement Process


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**Background:** This antimicrobial stewardship (AMS) quality improvement project was part of an ongoing outpatient antibiotic prescription review across our organization's six regional centers. Previous reviews identified site-specific and shared antibiotic prescribing patterns, providing contextual data to facilitate discussion with prescribers (1,2). Data from other centers became available for review, after transitioning to an electronic medical record system.

**Objective:** 1) To characterize the prescribing patterns of antibiotics and their clinical indications at outpatient

oncology centers; 2) To describe differences between these outpatient antibiotic prescribing practices with other centres' prescribing patterns identified from previous reviews; 3) To explore opportunities to align and optimize antibiotic prescribing practices, in collaboration with prescribers.

**Methods:** 1) Retrospective descriptive analysis of outpatient antibiotics and their clinical indications prescribed at BC Cancer Abbotsford, Surrey and Victoria from November 1- December 31, 2024; 2) Descriptive comparison of antibiotic prescribing patterns identified across regional centres and review cycles (Cycle 1: Vancouver from October 1 to November 30, 2022; Cycle 2: Prince George from October 1, 2023 to January 31, 2024; Cycle 3: Abbotsford, Surrey, Victoria from November 1 to December 31, 2024); 3) Review of notable findings with relevant prescribers.

**Results:** We reviewed 437 antibiotic prescriptions (Abbotsford: 98; Surrey: 173; Victoria: 166) in 413 patients. Overall, 203/437 (47%) prescriptions were for treatment indications, 110/437 (25%) prescriptions were for prophylaxis indications, and 124/437 (28%) prescriptions were for unclear indications. Medical oncology provided 195/437 (45%) prescriptions, dentistry provided 108/437 (25%) prescriptions, radiation oncology provided 88/437 (20%) prescriptions, and the remaining were from other prescribers.

Across the three sites, common treatment indications included urinary tract infections (Abbotsford: 28% ,11/40; Surrey: 17%, 13/75; Victoria: 27%, 24/88), skin and soft tissue infections (Abbotsford: 20%, 8/40; Surrey: 16%, 12/75; Victoria: 25%, 22/88), and lower respiratory tract infections (Abbotsford: 10%, 4/40; Surrey: 11%, 8/75; Victoria: 22%, 19/88). These findings were consistent with previous reviews.

Of the prophylactic prescriptions, ciprofloxacin was prescribed for indications not previously identified. Ciprofloxacin was standard prophylaxis for prostate fiducial marker and hydrogel spacer placement prior to stereotactic ablative body radiation therapy, a novel treatment modality delivered then only at Victoria and accounted for 21/70 (30%) of their prophylactic prescriptions. Radiation oncologists agreed to alternative prophylaxis after a collaborative review of the procedure workflow, regional antibiotic susceptibility patterns, and serious adverse drug reaction concerns with fluoroquinolones.

Ciprofloxacin was also routinely prescribed post-prostate brachytherapy for infection prophylaxis (Abbotsford: 23%, 3/13; Victoria: 20%, 14/70), unlike Vancouver's standard, where oral antibiotics were not prescribed post-procedure. We reviewed findings with radiation oncologists, who agreed to change their practice and recommended engaging with prostate radiation oncologists at the last regional centre.

**Conclusion:** This review characterized outpatient antibiotic prescribing across three more oncology centers. Previously not observed, high fluoroquinolone use was identified for antibiotic prophylaxis relating to various prostate radiation treatments. An ongoing review of outpatient antibiotics and their clinical indications is a valuable AMS strategy to identify different practices and patient populations across oncology regional centres, support prescriber engagement, and improve antibiotic prescribing.

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## 18
## Baseline Vaccinations of Oncology Patients at a Northern Ontario Cancer Program

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**Introduction:** Cancer patients starting immunosuppressive therapy are recommended to be up to date on their adult vaccinations by National Advisory Committee on Immunization (NACI) and the 2024 ASCO Guideline. In addition, clinicians should determine vaccination status in patients about to start cancer treatment (1,2). This quality improvement initiative aimed to review baseline vaccinations of newly referred cancer patients (NPATs) at the Algoma District Cancer Program (ADCP) and develop a process to document baseline vaccines at our clinic.

**Methods:** 112 NPAT charts were reviewed over an 8–week period from June 23-Aug 15, 2025. Patients provided their vaccination history at their first appointment, which was subsequently scanned into the patient chart. Vaccination history was additionally reviewed from clinic referral or available chart history. The following data was recorded for analysis: age, gender, diagnosis, allergies, access to a primary care provider, and vaccinations received up until the time of new patient referral. The data was recorded and analyzed using Microsoft Excel (2016).

**Results:** Among NPATs reviewed, 32% had baseline vaccination data for their appointment. Among NPATs reviewed, 83% had access to a primary care provider. Of patients with a vaccination history, the percentage of patients with either a partial or completed series per the ASCO recommended vaccinations for adults with cancer were as follows:

- Influenza (17%)
- RSV (1%)
- COVID-19 (13%)
- Tdap or Td (25%)
- Hep B (3%)
- Recombinant zoster (6%)
- Any Pneumococcal vaccine (14%)
- HPV (2%)

**Discussion:** The findings revealed a low baseline vaccination adherence, as previously documented in literature for oncology patients (3). Potential barriers to complete and accurate data collection likely include fragmentation across multiple data repositories, limited patient recall due to low medical history retention, and low health literacy rates (4,5). Oncology patients could benefit from a structured vaccination clinic provided by cancer programs prior to start immunosuppressive therapy. Pharmacists may be in a unique position to provide these programs.

**Conclusion:** These findings indicate markedly low baseline vaccinations and/or vaccination records among ADCP NPATs. A pharmacist-led vaccination clinic at our site has the potential to improve vaccine status and uptake. Moreover, pharmacist-led vaccination clinics may serve to help centralize vaccination records to support improved record keeping.

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## 19
## Development of a Pharmacist-Run Immunization Clinic at an Outpatient Oncology Clinic in Northern Ontario

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**Introduction:** People with cancer have low baseline vaccination rates prior to starting immunosuppressive therapy, which can increase their risk of vaccine-preventable illnesses and disability (1,2). Vaccination prior to starting treatment is recommended to both reduce this risk and maximize the immune response achieved (3,4). Recently, the Algoma District Cancer Program launched a pharmacist-run vaccination clinic for adult oncology patients. Patients are referred to the pharmacy team by their medical oncologists after their initial intake appointment at the cancer clinic. To support this program, various clinical, educational, and administrative tools had to be developed.

**Methods:** Our team consulted recent guidelines published by the American Society of Clinical Oncology (ASCO) (3), the Canadian Immunization Guide (4), the publicly funded immunization schedule for Ontario, and product monographs to develop the following tools to assist in the operation of this vaccination clinic:

- Patient education handout
- Updated immunization history patient data sheet
- Pharmacist decision guide
- Medical directive with local oncologists
- Referral tool (generated with the Electronic Medical Record)
- Clinic documentation templates and prescriptions

**Results:** An oncology-specific patient handout on vaccines and a pharmacist decision guide were created. The decision guide supports the pharmacist assessment to prescribe vaccines considering both evidence and patient preferences to assist with proper administration and timing of vaccinations. The use of a medical directive allows the pharmacist to prescribe vaccines and, as an outpatient clinic, access to the publicly funded supply of vaccines.

**Discussion:** Pharmacists in some provinces have authority to prescribe vaccines, and many in many provinces pharmacists have authority to administer vaccines (5). Pharmacist intervention has been shown to have a substantial impact on adult vaccination rates (6). Pharmacists are therefore a unique position within cancer clinics to recommend, prescribe, and administer vaccines prior to starting cancer treatments. The tools developed by our clinic can be used as templates for other cancer programs who want to improve in this area of care.

**Conclusion:** A pharmacist vaccine clinic was developed at our northern Ontario cancer clinic. Many tools developed for this clinic may be useful to other pharmacists or health care providers in oncology centers across Canada.

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## Research – Clinical

### 20

### Real-World Outcomes and Prescribing Patterns of Niraparib and Olaparib in Second-Line Maintenance Therapy for Relapsed Ovarian Cancer at BC Cancer

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**Background and Objectives:** Poly ADP ribose polymerase (PARP) inhibitors niraparib and olaparib are publicly funded in British Columbia as second-line maintenance therapy for platinum-sensitive relapsed epithelial ovarian cancer. Updated overall survival (OS) analysis from the NOVA trial prompted U.S. Food and Drug Administration (FDA) warnings in November 2022 restricting niraparib use in BRCA-wild type (BRCAwt) patients. Health Canada (HC) issued a similar communication in 2023, although product indications remained unchanged. The real-world impact of these regulatory warnings on prescribing is unclear. This study evaluated survival outcomes and prescribing patterns for niraparib and olaparib at BC Cancer and explored temporal changes following regulatory warnings.

**Methods:** This retrospective cohort study included patients receiving olaparib or niraparib as second-line maintenance therapy for relapsed ovarian cancer at six BC Cancer centres between December 1, 2021, and July 31, 2025. Patients were identified from the BC Cancer Pharmacy Data Warehouse using BC Cancer protocol codes, with data obtained through retrospective electronic chart review. OS and progression-free survival (PFS) were estimated descriptively using Kaplan–Meier curves, censoring at last follow-up or at data cutoff (Aug 31, 2025). Secondary outcomes included prescribing patterns and treatment discontinuation due to adverse effects. Dispense dates were examined relative to the FDA warning (November 14, 2022) and HC communication (February 16, 2023).

**Results:** 82 patients were identified: 53 patients met eligibility criteria and 29 were excluded as they were miscoded at medication dispense. In the niraparib cohort (n=33), 31 patients (93.9%) were BRCAwt and 2 patients (6.1%) were BRCA mutated. The olaparib cohort (n=20) had 19 BRCA-mutated patients (95%), with 1 BRCAwt patient (5%). The median follow-up for the overall cohort was 34.0 months (95% CI 25.9–42.1). Median OS and PFS for niraparib were 31.2 months (95% CI 26.3–36.1) and 10.1 months (95% CI 8.1–12.2), respectively. For olaparib, median OS was 37.4 months (95% CI 22.5–52.4) and median PFS was 27.9 months (95% CI 11.7–44.1). Of the BRCAwt patients that received niraparib, 68% initiated treatment prior to the FDA warning, and 32% after, with no additional change after the HC communication. Overall, 37.5% of BRCAwt patients had no post-warning niraparib dispenses after the regulatory warnings, whereas 62.5% had one or more post-warning dispenses.

**Discussion/Conclusion:** Observed PFS for niraparib and olaparib in this real-world cohort seemed comparable to or longer than that reported in landmark trials such as NOVA and SOLO2; however, the retrospective design, small sample size, and wide confidence intervals preclude meaningful cross-study comparisons. In addition, reliance on pharmacy data warehouse extracts may have led to incomplete capture of eligible patients. Niraparib utilization in the BRCAwt cohort appeared to decline after the FDA warning despite unchanged Canadian indications, although this observation is similarly limited by the small sample size. Larger, multicentre real-world studies with more complete data capture are needed to confirm these findings.

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## 21
## Evaluating T-Cell Engager Therapy: A Real-World Analysis of CRS, ICANS, and Operational Impacts in Oncology Care

**Diya Nijjar[1], Lollita Rahaman[1], Shalini Fernandes[1], Shannon Farley[1], Sabiha Delawala[1]**
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**Background:** T-Cell Engager (TCE) therapies are an emerging innovative form of immunotherapy, offering targeted treatment options for hematologic malignancies and small-cell lung cancers. By binding to both a T-Cell and a cancer cell concurrently, it triggers a potent anti-tumor immune response leading to the destruction of cancer cells. Although there are positive patient outcomes, these therapies have significant adverse effects during a patient's initial doses, known as the Ramp-Up Dosing period. Particularly, there is a risk of Cytokine Release Syndrome (CRS) and Immune Effector Cell-Associated Neurotoxicity Syndrome (ICANS). CRS is a hyperinflammatory state with symptoms ranging from fever, hypoxia, and hypotension to multi-organ failure. ICANS consists of a neurological syndrome ranging from mild confusion to coma. ICANS is less common than CRS following TCE therapy and may occur with or without the presence of CRS. William Osler's oncology program initiated the first TCE therapy in August 2023, and at the time of initiation, there were limited resources and clinical protocols available. Health systems must understand these adverse events to safely manage care delivery and prepare for future outpatient models.

**Objective:** The study examined the incidence, severity, and timing of adverse events. This analysis allowed for generating recommendations to transition to more efficient patient care models, specifically an out-patient model.

**Methods:** A retrospective chart review was conducted at William Osler Health System- Oncology Program,

studying the clinical data for 30 patients who received T-Cell Engager therapy. The data collection period was from August 2023 to May 2025. Findings were benchmarked against current literature to validate trends and inform clinical decision-making.

**Results/Discussion:** CRS was observed in 77% of patients, most commonly at the Grade 2 stage, while ICANS was observed in only 27% of patients. As CRS was observed in most patients, it was analyzed in further detail. The majority of CRS events occurred post Dose 1, most often within 12–24 hours following the dose, and all CRS events occurred within 48 hours. Hours elapsed between dose administration and CRS onset is consistent with the literature. Recommendations were generated for patients and their family as well as clinical operations to guide TCE therapy as an out-patient model, thereby reducing hospital burden of in-patient beds.

**Conclusion:** These preliminary findings from this analysis offer valuable insight into designing safer and more efficient care models, including potential for an out-patient model down the line. Ultimately, this research will be used to inform internal planning, in terms of supplemental staffing, patient criteria, and proactive monitoring by nurses. Future research can generate recommendations for each TCE specifically. These findings will be shared with peer institutions to support the translation of evidence into practice, contributing to the broader goal of health system improvement and knowledge exchange.

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## 22
## Incidence of Thromboembolic Events in Testicular Cancer Patients Receiving Cisplatin (TESTCIS Study)

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**Introduction:** Despite the increased incidence of testicular cancer in men aged 15 to 35, patients with this neoplasm have a high five-year survival rate thanks to chemotherapy. However, cisplatin, a drug used in the standard treatment for testicular cancer, seems to be associated with an increased incidence of thromboembolic events. The TESTCIS study aimed to describe the incidence of thromboembolic events in testicular cancer patients receiving cisplatin, identify the risk factors for thromboembolism, and determine the proportion of patients whose chemotherapy regimens had to be modified after a thromboembolic event to assess the appropriateness of concomitant thromboprophylaxis with cisplatin use.

**Study Design:** TESTCIS is a descriptive, longitudinal and retrospective study that was carried out at four hospitals in the Chaudière-Appalaches administrative region of the province of Quebec. Patients included in the study must have initiated and completed cisplatin-based chemotherapy between January 1, 2012 and November 30, 2023. Logistic regression was used to establish a relationship between the identified variables and a thromboembolic event.

**Results:** In the study, 23 out of 56 patients (41.1%) presented with at least one thromboembolic event. For 19 of these 56 patients (33.9%) the thromboembolic event was major, i.e. a pulmonary embolism, deep vein thrombosis, arterial thrombosis or cerebral venous thrombosis. The majority of these thromboembolic events (84.4%) occurred while the patients were on chemotherapy. Among the characteristics studied, disease recurrence ($p = 0.03735$) and a Khorana score of 2 ($p = 0.01124$) had a statistically significant relationship with the occurrence of a thromboembolic event. The chemotherapy regimen was changed for three patients (5.4%) due to a thromboembolic event. Overall, 7 out of 56 patients (12.5%) received thromboprophylaxis, and three of these patients nevertheless experienced a thromboembolic

event. Five patients (8.9%) experienced bleeding, but only one of these five patients (who was not on anticoagulant therapy) experienced a major bleed.

**Conclusion:** The occurrence of thromboembolic events in 41.1% of patients in the TESTCIS study prompted us to initiate preventive measures. Based on our results analysis, we recommend that thromboprophylaxis be considered for patients with recurrent testicular cancer or who have a Khorana score of 2 or more at initial assessment. Careful attention should also be paid to patients with superficial venous thrombosis, as this condition may put the patient at risk of a subsequent major thromboembolic event. The efficacy and safety of thromboprophylaxis in this patient population should be evaluated further in a post-intervention study.

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## 23
## Are We Overdosing Our Patients? Clinical Impact of Using CKD-EPI Instead of CamGFR for Carboplatin Dosing


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**Background:** Accurate estimation of renal function is critical for safe dosing of carboplatin using the Calvert formula. In routine practice, glomerular filtration rate (GFR) is frequently estimated using equations developed in populations with chronic kidney disease, such as CKD-EPI. However, cancer patients differ substantially from nephrology cohorts with respect to body composition, inflammation, and creatinine kinetics. CamGFRv2 was specifically developed and validated in oncology populations and has demonstrated improved accuracy, particularly in patients with normal or near-normal renal function. We hypothesized that the use of CKD-EPI instead of CamGFRv2 leads to systematic carboplatin overdosing and increased treatment-related toxicity.

**Methods:** We conducted a retrospective analysis of 100 consecutive adult cancer patients treated with carboplatin at a tertiary care center. Estimated GFR was calculated using CKD-EPI and Carboplatin doses were calculated using the Calvert formula. We compared with values that would have been obtained using CamGFRv2. Clinically meaningful overdosing was defined as a $\geq$15% higher carboplatin dose. Three patients were excluded from outcome analyses (two patients initiated at 80% dose per protocol and one patient treated within a clinical trial with protocol-mandated dose management). We measured carboplatin dose reductions, dose reductions of combination chemotherapy agents, treatment delays, increased laboratory monitoring due to inadequate blood counts, addition of granulocyte colony-stimulating factor (G-CSF), and severity of hematologic toxicity (neutropenia, thrombocytopenia, and anemia).

**Results:** Using CKD-EPI, 26 out of 100 patients received a carboplatin dose at least 15% higher than if CamGFRv2 had been used. After exclusions, 87% of patients had the composite endpoint of dose reduction, dose delay, dose omission, addition of G-CSF or repeat labs. In the individual endpoints assessments, 56.5% of patients had a chemotherapy dose reduction and 56.5% had dose delays. All grade neutropenia was reported in 73.9% of patients and 60,9% of patients had grade 3 or 4 neutropenia. Anemia was reported in 87% of patients at all grades while grade 3 or 4 were reported in 13% of patients. All grade thrombocytopenia was reported in 47,8% of patients with 26.1% of patients having grade 3 or 4 of this event. Of the 3 patients that had no events in the composite endpoint, one patient still had a grade 3 neutropenia event. More than a third of patients (34,8%) did not receive the full treatment plan.

**Conclusion:** In oncology patients, using CKD-EPI to estimate renal function for carboplatin dosing results in

systematic overdosing compared with CamGFRv2. This practice is associated with a marked increased in hematologic toxicity, dose reductions, dose delays and resource utilization. Given that CamGFRv2 was specifically developed in cancer populations and provides a more accurate estimate of renal function in patients with normal creatinine clearance, its use should be favored over CKD-EPI when dosing carboplatin. Continued reliance on nephrology-derived equations may unintentionally expose patients to avoidable toxicity and compromise expected outcomes.

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Volume 32 • Issue 3S • April 2026 (Supplement)

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ISSN: 1078-1552