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Mary Ann Liebert
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ISOPP International Symposium 2026 Abstracts

Category: Clinical Audit

ID - Country: 13289 - Australia

Appropriateness of Peripheral Parenteral Nutrition in Oncology – Opportunities for the Pharmacist

Mei Ko[1] and Jeanie Misko[1]
[1]*Fiona Stanley Hospital*

Introduction and Aims: Peripheral parenteral nutrition (PPN) is a standardised, commercially available product that provides short-term supplementation of nutrition in patients unsuitable for oral/enteral nutrition, without the need for central venous access. Oncology patients may be at high risk of malnutrition due to both cancer and treatment. PPN offers a short-term, peripheral access alternative, particularly while awaiting feeding tube insertion, and is new to medical oncology at our tertiary hospital in metropolitan Western Australia. The aim of this clinical audit is to review PPN prescribing and adherence to institutional PPN guidelines for inpatients in the oncology ward.

Methods: A 2 year retrospective review was undertaken of PPN usage in patients admitted to the institution's oncology inpatient ward (n=73). Patients were identified using dispensing records (Pyxis, Becton Dickinson, Franklin Lakes). Data were collected on patient demographics, PPN indication, review by pharmacist/dietician/medical oncologist, frequency of biochemistry orders, BGL (blood glucose level) monitoring frequency and additional electrolyte supplementation. Patients admitted under non-oncology specialties or receiving total parenteral nutrition (TPN) / enteral nutrition were excluded.

Results: Seventy-three patients (61.64% male, median age 62 years) most commonly with upper gastrointestinal cancer (63.01%) were reviewed, including 69 medical oncology and 4 radiation oncology patients. PPN was primarily used for malnutrition secondary to poor oral intake (24.66%), followed by gastrointestinal obstruction (19.18%) or gastrointestinal toxicities (16.44%). Almost all PPN use (91.78%) complied with guidelines for treatment initiation, but nearly a quarter of patients (21.92%) received PPN beyond the guideline duration of five days. Moderate to severe risk of refeeding syndrome was identified in 82.19% of patients, with 45.21% requiring additional electrolyte supplementation. Clinical pharmacists reviewed 80% of PPN orders daily. No patients experienced refeeding syndrome during PPN use and seven (9.59%) patients required TPN for longer term nutritional supplementation. Compliance with monitoring frequency varied for BGL (56.16%) and biochemistry (64.38%).

Discussion: Most patients had appropriate indications, review and electrolyte supplementation for PPN but compliance with monitoring varied. BGL monitoring can be improved by documenting frequency on the paper BGL monitoring chart and early referral to endocrine for high BGL. Biochemistry ordering could be improved by addition of a PPN order set to online ordering and pharmacist access to order these tests. Additionally, the pharmacist can provide guidance and interpretation of these results and recommend electrolyte supplementation during daily pharmacy review and on medical team rounds. The pharmacist can also ensure a plan is in place after PPN maximum recommended duration.

Conclusion and implications: These results suggest PPN is appropriately used within the institution in medical oncology. Radiation oncology patients are also at high risk of malnutrition and the four patients receiving PPN did not experience adverse effects, so the institutional guideline could be expanded to benefit these patients. Improvements to monitoring and duration of therapy would further improve guideline adherence and patient outcomes.

Category: Clinical Audit

ID - Country: 13955 - Tunisia

Assessment of Compliance with Measures to Prevent High-Dose Methotrexate Toxicity

Rahma katfaoui[1], Raafa Ben Saada[1], Khadija Ben chaabane[1], Myriam Iraqui[1], Imen Guiza[1], Nader Harrabi[1] and Mohammed Ali Youssfi[1]
[1]Main Military Hospital instruction of Tunis

Introduction: High-dose methotrexate (HD-MTX) is an essential treatment for certain hematologic malignancies, but its use carries a risk of severe toxicities. Adherence to prevention protocols is crucial to limit these risks. This study aimed to evaluate compliance with HD-MTX toxicity prevention measures, identify potential gaps, and propose areas for improvement.

Methods: This is an observational, retrospective, single-center study, including patients hospitalized between January and June 2025 in the hematology department and who received MTX-HD treatment. Data were collected from medical records using a standardized data sheet.

The parameters studied included: MTX dosage and indication, alkaline hydration, urinary pH, duration and timing of folinic acid administration, MTX plasma trough concentrations (H24, H48, H72), biological monitoring and reported toxicities according to the CTCAE (COMMON TERMINOLOGY CRITERIA FOR ADVERSE EVENTS).

Patients with incomplete records were excluded from the study.

Results: Nine courses were evaluated among five patients (age 3–76 years; BSA 0.6–2 m^2). The main indications were acute lymphoblastic leukemia and diffuse B-cell lymphoma.

Toxicities $\geq$ grade 2 were observed in 66.6% of the courses (hepatic, renal, digestive, and neurological). Alkaline hydration ($\geq$ 3 $L/m^2/d$) was correctly achieved in all treatments; however, urinary pH monitoring was documented in only 22.2% of cases. Adjustment of folinic acid dosage according to residual MTX plasma levels was performed in 100% of treatments. Pharmacokinetic monitoring was compliant with recommendations, with measurements at H36, H48, H72, and H96, and continued until normalization in cases of severe toxicity.

Discussion of results: This evaluation highlights good overall implementation of preventive measures but identifies areas for improvement, particularly regarding the documentation of urinary pH and diuresis. Strengthening these practices may help optimize HD-MTX tolerance.

Category: Clinical Audit

ID - Country: 12685 - United Kingdom

Evaluating Niraparib-Related Toxicity in Gynaecological Cancer Maintenance: Insights from the First Year of Treatment

katy Ghavami-kia[1], Antonio Gonzalez-Alonso[2], Polyxeni STERGIOU[3] and Robert Morgan[4]
[1]katy ghavami-kia
[2]Antonio Gonzalez-Alonso
[3]The Christie NHS Foundation Trust
[4]Robert Morgan

Introduction/Objectives: Niraparib is a selective oral inhibitor of PARP-1 and PARP-2, critical for repairing single-stranded DNA breaks. Its inhibition accumulates DNA damage, leading to double-stranded breaks and apoptosis in tumour cells with homologous recombination deficiency (HRD), often due to BRCA1/2 mutations. PARP inhibitors are particularly effective in patients with a BRCA1/2 mutation or HRD. This study evaluated 50 patients treated with Niraparib, primarily BRCA wild-type, including one BRCA-mutant patient unable to tolerate Olaparib. Niraparib has been shown to improve progression-free survival (PFS) significantly 1,2 across both HR genotypes without a marked overall survival (OS) benefit 3. Its notable toxicity can limit treatment duration and affect quality of life. This audit provides real-world data to help clinicians weigh the risks and benefits of Niraparib in BRCA wild-type and homologous recombination proficient (HRP) patients.

Methods: Data were retrospectively collected from 50 patients treated with first-line maintenance Niraparib within their first year of treatment between September 2024 and May 2025, encompassing all BRCA-mutant and wild-type cases, including HRD and HRP tumours. Variables included demographics, tumour histology, prior treatments, and treatment-related data such as toxicity, interruptions, dose reductions, and therapy discontinuation. The impact on quality of life (QoL) and treatment adherence was assessed using electronic Patient-Reported Outcome Measures (ePROMs), with analysis conducted by The Christie analysts.

Results: Among the 50 patients treated with Niraparib, only one did not report adverse effects, whereas 80%

experienced varying degrees of fatigue. Symptoms such as headaches and nausea were reported by over 50% of participants, with notable instances of insomnia documented in 48%. Although hypertension is recognised as a potential side effect, fewer than 40% of patients reported it. Vomiting occurred infrequently, affecting only six patients, highlighting the greater prevalence of nausea. Thrombocytopenia was the most severe form of toxicity (grade 4), reported by two patients (see Figure). Notable grade 3 toxicities included hypertension (4 patients) and fatigue (3 patients). Insomnia (16 patients) and hypertension (10 patients) were among the common grade 2 effects, with fatigue being the most frequent grade 1 toxicity (24 patients). Niraparib was discontinued in 38% of cases, primarily due to disease progression (68.4%) and toxicities (26.3%). The average treatment delay caused by toxicities was approximately 15 days, with 42% of patients needing dose reductions. A 300mg starting dose correlated with increased toxicity severity, notably fatigue and gastrointestinal symptoms, emphasising the importance of monitoring. Patients over the age of 75 reported higher rates of toxicities such as oral mucositis, while patients under the age of 60 experienced more nausea and headaches. Additionally, higher body mass index (BMI) over 30 was strongly associated with insomnia and headaches, whereas lower BMI was linked to fatigue and vomiting, suggesting body composition may influence toxicity profiles and treatment outcomes.

Figure: Illustrating the distribution of adverse events reported by patients, categorised by severity grades (grade 1 to grade 4).

Conclusion: The findings from this study indicate that initiating treatment with a higher dose of Niraparib (300 mg) may be correlated with an elevated risk of toxicity among patients. This increased toxicity could lead to the need

References

1. González-Martín A, Pothuri B, Vergote I, DePont Christensen R, Graybill W, Mirza MR, et al. Niraparib in Patients with Newly Diagnosed Advanced Ovarian Cancer. New England Journal of Medicine [Internet]. 2019 Sep 28;381(25). Available from: https://www.nejm.org/doi/full/10.1056/NEJMoa1910962
2. González-Martín A, Bhavana Pothuri, Ignace Vergote, Graybill W, Lorusso D, McCormick CB, et al. Progression-free survival and safety at 3.5 years of follow-up: results from the randomised phase 3 PRIMA/ENGOT-OV26/GOG-3012 trial of niraparib maintenance treatment in patients with newly diagnosed ovarian cancer. European Journal of Cancer. 2023 Aug 1;189:112908–8.
3. Monk BJ, M.P. Barretina-Ginesta, B. Pothuri, I. Vergote, Graybill W, Mirza MR, et al. Niraparib first-line maintenance therapy in patients with newly diagnosed advanced ovarian cancer: final overall survival results from PRIMA/ENGOT-OV26/GOG-3012 trial. Annals of Oncology. 2024 Sep 1.

Category: Clinical Audit

ID - Country: 13945 - Australia

Evaluating the impact of EMR-based changes on type and severity of medication errors related to transdermal opioid patches.

Bishma Jayathilaka[1], Joyce Sun[1], Jeffrey Ong[2], Cheryl Jackson[3]
[1]Peter MacCallum Cancer Centre
[2]The Royal Children's Hospital
[3]Parkville EMR

Introduction: A rise in medication errors related to transdermal opioid patches prompted a multidisciplinary, co-design approach to embed safety features in the electronic medical record (EMR) at a specialist cancer centre. Three automated EMR-based changes were implemented on the Medication Administration Record (MAR) to prompt action and documentation of 1) daily patch check, 2) patch removal before a new patch administration, and 3) patch removal when a patch order is discontinued. A clinical audit was conducted to identify the rate of medication incidents before and after the implementation of EMR-based changes. The audit aimed to identify the association between the EMR-based interventions and changes to event rate, medication error type, and harm severity.

Method: Incident reports for 12-month period before and after the EMR-based changes were included. Pre-implementation period was 14/12/2022 to 13/12/2023 and post-implementation period was 15/12/2023 to 14/12/2024. Retrospective analysis of incidents and patient records were conducted. Incidents were categorised by error type using the Australia Commission on Safety and Quality in Health Care (ACSQHC) Classification Tool for Health Service Organisations (1), and for harm severity using the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) Index (2). Bed-day data (inpatient overnight occupancy) was used to calculate event rate of incidents. Ethics approval was granted by the Peter Mac Ethics Committee.

Results: There were 26 incidents related to transdermal opioid patches pre-implementation and 14 post-implementation. There was a significant reduction in event rate from 0.75 and 0.31 incidents per 1000 bed-days, respectively. This represents a rate difference of 0.44 per 1000 bed-days and rate ratio of 2.40; 95% CI 1.27-4.61 (p-value = 0.008). In the pre-implementation period, duplicate therapy, wrong strength, and omitted dose were the most common error types. Post-implementation, the most common error types were extra dose given and uncategorised errors. Uncategorised errors frequently involved a missed patch removal prior to admission. Harm severity was assessed against the NCC MERP Index categories A to H. There were no category A or B (no harm no error) incidents. Harm severity was reduced post-implementation. In the pre-implementation period, there were 21 category C (no harm) incidents, one incident each in categories D, E and F (temporary harm requiring intervention or hospitalisation), and two incidents in category H (situation requiring medical support). In the post-implementation period, there was one category B and 13 category C incidents.

Conclusion: Implementation of EMR-based safeguards reduced both the frequency and severity of transdermal opioid patch errors, demonstrating the impact of targeted digital safety interventions. This audit highlights the capability of EMR-based changes to reduce medication errors involving transdermal opioid patches. This study is limited by small sample size and retrospective, single-centre design. The ACSQHC Classification Tool did not adequately capture patch-specific issues such as failure to remove patches applied a patch prior to admission. This may represent unique incidents related to transdermal opioid patches. This audit contributed to clinical care by highlighting the need for thorough physical body checking on admission to address duplicate therapy during inpatient stay.

References

1. Australia Commission on Safety and Quality in Health Care (ACSQHC) Classification Tool for Health Service Organisations. Accessed 31 March 2025. Available from: https://www.safetyandquality.gov.au
2. National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) Index for Categorizing Medication Errors. Accessed 31 March 2025. Available from: https://www.nccmerp.org/types-medication-errors

Category: Clinical Audit

ID - Country: 13952 - Tunisia

Evaluation of the management of chemotherapy-induced nausea and vomiting in Hematology and Oncology departments

Rahma katfaoui[1], Raafa Ben Saada[1], Khadija Ben chaabane[1], Myriam Iraqui[1], Mehdi Bejaoui[1], Amani Laajili[1] and Mohammed Ali Youssfi[1]
[1]Main Military Hospital instruction of Tunis

Introduction: Chemotherapy-induced nausea and vomiting (CINV) are among the most distressing adverse events reported by patients. This study aimed to assess the management of CINV in the hematology and oncology departments, comparing practices with MASCC (Multinational Association of Supportive Care in Cancer) and AFSOS (French-speaking Association for Supportive Oncology Care) recommendations.

Methods: This is a prospective study carried out in November 2024 in the Hematology and Oncology department of the Main Military Instruction Hospital of Tunis. All patients receiving chemotherapy during this period were included. Data were collected using a pre-established form. Antiemetic prophylactic treatment was evaluated for adequacy according to MASCC and AFSOS recommendations and its effectiveness in controlling CINV. Data analysis was performed using Excel.

Results: A total of 44 patients were included. Among them, 88.64% of acute-phase management and 86.37% of delayed-phase management were not compliant with the recommendations. Overall, 72.72% of cases required revision, particularly through the implementation of prophylactic protocols adapted to the level of emetogenic risk determined by the individual risk-factor score. Despite these non-compliances, only 20.45% of patients continued to experience disabling nausea. All of these patients had an emetogenic risk score greater than 4.

Discussion of results: This study highlights the need to adapt CINV management protocols based on emetogenic risk. Although symptoms were controlled in most patients, improvements are required to ensure better adherence to guidelines and to optimize patient care.

Category: Clinical Audit

ID - Country: 13930 - Singapore

Harnessing Large Language Models for Medication Error Analysis in Oncology

Chew, Lita[1], Feng Yong Chium[2], Mohammed Nazri Abdul Ghani[3] and Joanne Ho[4]
[1]*National Cancer Centre Sinagpore*
[2]*National Cancer Centre*
[3]*KK Women's and Children's Hospital*
[4]*Singapore General Hospital*

Medication errors remain a significant concern in oncology, where complex regimens and vulnerable patient populations heighten the risks of adverse events and increased health costs. Traditional incident review methodologies such as Root Cause Analysis (RCA) and the Human Factors Analysis and Classification System (HFACS), offer systematic approaches for identifying causal factors but are resource-intensive, subjective, and often inconsistent. The emergence of Large Language Models (LLMs) presents an opportunity to automate and standardize the classification and analysis of medication error incidents in oncology. The primary objective of this study is to compare the effectiveness and alignment of LLM-generated incident reviews with those conducted by expert panels.

This retrospective study reviewed de-identified medication error incident reports from National Cancer Centre Singapore (NCCS) covering January 2024 to October 2025. Reports were standardised into a common template capturing error types, contributing factors, and recommendations. Analyses were performed using a retrieval-augmented generation LLM, applying RCA and HFACS frameworks. LLM outputs were independently benchmarked against classifications from hospital-based medication safety pharmacists and multidisciplinary reviewers. Evaluation metrics included Likert scale ratings for qualitative dimensions (framework alignment, contextual understanding, relevance, consistency, clarity, and conformity to expert opinion), along with quantitative scores (precision, recall, F1-score). Statistical concordance was assessed with Wilcoxon signed-rank tests and Cohen's kappa.

LLM outputs achieved qualitative ratings comparable to human reviewers, with framework alignment and contextual understanding scores averaging above 4 on a 5-point scale. Precision, recall, and F1-scores ranged from 0.68 to 0.79, favourably reflecting accuracy in incident classification and actionable recommendations. LLMs excelled in producing consistent, well-structured case summaries and recommendations. However, challenges emerged around hallucinated insights, generic recommendations, and the need for post-processing in HFACS formatting. Notably, expert consensus remained variable, and Cohen's kappa revealed inter-rater reliability was not consistently high, highlighting the subjective nature of complex medication safety incidents. Process improvements, such as refined LLM prompts and dynamic confidence calibration, further enhanced system alignment and utility.

LLMs demonstrate efficiency and reliability advantages over traditional manual reviews, particularly in scaling incident analysis and generating standardised outputs. While LLM suggestions closely align with expert understanding and institutional norms, certain recommendations require human oversight for contextual appropriateness. Integrating LLMs into review workflows supports targeted improvements, exposes latent process issues, and enables rapid triage of incident categories. Fostering collaboration between human experts and AI tools can strengthen clinical safety nets and promote continuous workflow optimisation.

The studied supports the implementation of LLMs as decision-support tools within oncology medication safety programs, aiming to enhance reliability, efficiency, and ultimately patient safety. Future research should prioritize iterative improvement, ethical data governance, and the development of standardized evaluation metrics for clinical integration.

Category: Clinical Audit

ID - Country: 12549 - Australia

Investigating the timeliness of zoledronic acid initiation in adjuvant and neoadjuvant breast cancer patients

Sally Ip[1], Jasmine Lau[1], Jim Siderov[1] and Belinda Yeo[1]
[1]*Austin Health*

Introduction: Zoledronic acid is beneficial in postmenopausal, primary breast cancer patients, regardless of hormone receptor and HER2 status; due to effects on bone physiology, bisphosphonates modify the metastases process, significantly reducing rates of recurrence and mortality[1,2]. Meta-analysis has shown that bisphosphonates in post-menopausal women significantly reduce rates of recurrence (RR 0.86, 95% CI 0.78-0.94, $p<0.05$), distant recurrence (RR 0.82, 95% CI 0.74-0.92, $p<0.05$), bone recurrence (RR 0.72, 95% CI 0.60-0.86, $p<0.05$), and breast cancer mortality

(RR 0.82, 95% CI 0.73-0.93, p<0.05)[1, 2]. The American Society of Clinical Oncology guideline recommends initiating bisphosphonates early, within 3 months of definitive surgery or 2 months of adjuvant chemotherapy completion[3].

Aim: To assess timeliness and explore potential factors underlying delays to zoledronic acid initiation in adjuvant and neoadjuvant breast cancer patients at a large metropolitan teaching hospital.

Methods: A retrospective audit was conducted on patients receiving zoledronic acid between 1/1/2023 and 31/12/2024. Data including demographic data, chemotherapy and zoledronic acid treatment dates, surgery date, and reasons delaying zoledronic acid initiation were extracted from electronic medical records. The primary endpoints were median time from chemotherapy completion or surgery to the first zoledronic acid dose, and percentage of patients initiated on zoledronic acid within guideline-recommended timeframes. The secondary endpoint was to identify reasons underlying delays to zoledronic acid initiation.

Results: A total of 175 patients (median age 58.5 years) were included in our study. Of these, 47% (n=83) received adjuvant chemotherapy, 10% (n=18) received neoadjuvant chemotherapy, and 42% (n=74) underwent surgery only. The majority of patients had luminal breast cancer (89%, n=17), with the remaining 10% (n=17) having HER2 positive breast cancer and 1% (n=2) having triple negative breast cancer.

The median time to zoledronic acid initiation was 6.5 months post chemotherapy completion for adjuvant patients, 5.5 months post chemotherapy completion for neoadjuvant patients, and 6 months post surgery for surgery only patients. 13% (n=11/83) of neoadjuvant patients, 28% (n=5/18) of neoadjuvant patients and 19% (n=14/74) of surgery only patients had zoledronic acid initiated within guideline recommended timeframes.

Potential reasons delaying zoledronic acid initiation were radiotherapy scheduling, delays to hormonal therapy initiation requiring subsequent treatment review, requiring dental clearance, and low vitamin D level.

Discussion: Delay to zoledronic acid initiation was observed across all treatment groups. These delays represent missed opportunities to optimize treatment and reduce recurrence risk. Strategies that can be considered to assist with prompt initiation include timely referral for dental assessments, early initiation of vitamin D supplementation, flagging delays in hormonal therapy initiation or radiotherapy scheduling, educating patients and raising awareness among clinicians, and initiating zoledronic acid at the end of chemotherapy in adjuvant and neoadjuvant settings. Addressing these barriers could significantly improve timeliness of treatment and patient outcomes.

Conclusion: Pharmacists play an important role in raising awareness of delayed zoledronic acid initiation and implementing strategies to improve timely administration to ensure optimal patient outcomes.

References

1. Cancer Institute NSW. eviQ: Breast adjuvant zoledronic acid [Internet]. Sydney: Cancer Institute NSW; 2022 [cited 2025 Oct 9]. Available from: https://www.eviq.org.au/medical-oncology/breast/neoadjuvant-adjuvant/4458-breast-adjuvant-zoledronic-acid#evidence
2. Early Breast Cancer Trialists' Collaborative Group (EBCTCG). Adjuvant bisphosphonate treatment in early breast cancer: Meta-analyses of individual patient data from randomised trials. Lancet. 2015;386(10001):1353–61. doi:10.1016/S0140-6736(15)60908-4
3. Eisen A, Somerfield MR, Winer EP, Cadoo KA, Dhesy-Thind S, Hershman DL, et al. Use of adjuvant bisphosphonates and other bone-modifying agents in breast cancer: ASCO–OH (CCO) guideline update. J Clin Oncol. 2022;40(7):787–800. doi:10.1200/JCO.21.02647

Category: Clinical Audit

ID - Country: 14258 - India

Pharmacist-Led Digital Screening to Identify High-Risk Drug Interactions in Cancer Patients Transitioning to Non-Oncology Care: A Pilot Service Evaluation

Snehal Vhajage[1]
[1] *SPPU*

Introduction and Aims/Objectives: Cancer patients frequently continue medication therapy at general hospitals, primary care clinics, and community pharmacies, where pharmacists may not have specialized oncology training. These patients are at increased risk of clinically significant drug–drug interactions (DDIs) due to complex regimens involving anticancer medicines, corticosteroids, antifungals, anticoagulants, and medications for comorbid diseases. Undetected DDIs can result in avoidable toxicity, hospitalizations, and reduced treatment adherence.

This project aimed to evaluate the feasibility and impact of a pharmacist-led digital medication safety screening

model in identifying and managing high-risk DDIs among cancer patients receiving prescriptions outside oncology centres.

Study Design/Methods: A prospective service evaluation was conducted over 8 weeks in a general hospital outpatient pharmacy. Adult patients with an active cancer diagnosis who presented with ≥5 medications (anticancer, supportive, or chronic disease therapy) were included. Medication profiles were obtained from prescriptions and patient/caregiver interviews.

Drug interaction screening was performed using Lexicomp®, DrugBank, and NCCN interaction tables. Interactions were categorized as:

Severe (Requires change/avoidance)
Moderate (Requires monitoring/adjustment)
Minor (Safe with routine monitoring)
Interventions included: prescriber communication, patient counseling, dose modification suggestions, and addition of monitoring recommendations. Outcomes measured: number/type of DDIs detected, pharmacist interventions, prescriber acceptance rate, and patient understanding of warning symptoms.

Results/Outcomes: A total of 52 patients (mean age 58 ± 11 years) were screened, involving 412 medications.

Severe DDIs identified: 36 (8.7%)
Moderate DDIs: 124 (30.1%)
Minor DDIs: 252 (61.2%)

The most frequent severe DDIs involved:
Azole antifungals + Tyrosine Kinase Inhibitors (QT prolongation risk)
Warfarin + Capecitabine (increased INR and bleeding risk)
Prednisolone + Antidiabetics (loss of glycemic control)

Pharmacist interventions:
31 medication adjustments proposed
Prescriber acceptance rate: 83.8% (26 accepted)
52 patients received brief toxicity and monitoring counseling
47 patients (90.4%) reported improved understanding of medication risks during follow-up questioning.
No adverse drug events related to the screened interactions occurred during the follow-up period.

Discussion: The findings demonstrate that non-oncology pharmacists can effectively identify and mitigate high-risk DDIs using digital clinical decision support tools. The high prescriber acceptance rate reflects the clinical relevance of pharmacist recommendations. The service required minimal resources and can be integrated into routine workflow.

Conclusion and Implications: A pharmacist-led digital DDI screening model is feasible, impactful, and scalable in non-oncology settings. It improves medication safety, enhances interdisciplinary communication, and empowers pharmacists to support cancer patients beyond specialized centers. Broader adoption could reduce preventable toxicity and improve continuity of care in resource-variable environments.

References

1. Riechelmann RP, Tannock IF, Wang L, Saad ED, Taback NA, Krzyzanowska MK. Potential Drug Interactions in Cancer Patients Receiving Chemotherapy. J Clin Oncol. 2007;25(4):480–6.
2. van Leeuwen RWF, Brundel DHS, Neef C, van Gelder T, Mathijssen RHJ, Burger DM, et al. Prevalence of Potential Drug–Drug Interactions in Cancer Patients Treated With Oral Anticancer Drugs. Br J Cancer. 2013;108(5):1071–8.
3. Böhm L, Gripp S, Tsvetkova K, Klinkhammer-Schalke M, Hübner J. Clinically Relevant Drug–Drug Interactions in Cancer Patients Receiving Oral Antineoplastic Therapy. Support Care Cancer. 2021;29(8):4697–706.
4. Hilbrands LB, van den Bergh AC, Huitema ADR, Jansman FGA. Drug–Drug Interactions Between Tyrosine Kinase Inhibitors and Azole Antifungals: A Review of the Evidence and Clinical Considerations. Crit Rev Oncol Hematol. 2022;169:103549.
5. Saif MW, Shah MM, Shah AR. Bleeding Risk in Cancer Patients on Capecitabine and Warfarin: A Case Series and Review of the Literature. Clin Colorectal Cancer. 2009;8(3):182–5.

Category: Clinical Audit

ID - Country: 13947 - United Kingdom

Real-world experience of Capivasertib in HR-positive, HER2-negative, AKT-mutated advanced breast cancer: HCA UK cohort analysis

Sofia Naureen[1] and Angela Graham-Douglas[1]
[1]*HCA Healthcare*

Introduction/Aim: Capivasertib, an oral AKT inhibitor, has demonstrated efficacy in combination with Fulvestrant in hormone receptor-positive, HER2-negative advanced breast cancer following progression on CDK4/6 inhibitors, as shown in the CAPItello-291 trial. This study aimed to evaluate the real-world safety

and treatment outcomes of Capivasertib in a UK private healthcare setting, focusing on patients with advanced or metastatic disease and AKT pathway mutations.

Study Design: This is a retrospective, observational cohort study conducted across multiple HCA Healthcare UK sites, evaluating real-world use of Capivasertib in patients with advanced or metastatic hormone receptor-positive (HR+)/HER2-negative breast cancer. The study included 24 patients who initiated Capivasertib treatment between October 2024 and May 2025. All patients had confirmed AKT pathway mutations, including PIK3CA, PTEN, or AKT1, as identified through molecular profiling.

Clinical data were extracted from electronic medical records using an automated data collection tool. Variables included patient demographics (age, ECOG performance status), tumour receptor status (ER/PR), prior lines of systemic therapy, and treatment duration. Toxicity was assessed and graded according to the Common Terminology Criteria for Adverse Events (CTCAE) version 4.0, with particular attention to known class-related adverse events such as hyperglycaemia, rash, and gastrointestinal symptoms.

Treatment exposure was evaluated by determining the percentage dose administered per cycle. Patient outcomes were assessed, with documentation of discontinuation reasons such as disease progression, time to next treatment, treatment-related toxicity, or other clinical considerations.

Results: Median age was 59 years; all patients had ECOG PS 0–1. 75% were on second-line or later therapy, with 100% ER+ and 42% PR+ status. Most common mutations were PIK3CA (n=16), PTEN (n=2), and AKT1 (n=2). Median number of cycles was 5. 90% patients started at dose level 1 (100% dose) with 12% and 10% of patients requiring a dose reduction to dose level 1 and 3 respectively. At data cut-off, 16 patients remained on treatment; 4 had disease progression with a time to next treatment ranging from 2-6months, 2 discontinued due to toxicity (sciatica, grade 3 rash), 1 death occurred within 30 days of treatment (unrelated to treatment), and 1 was assumed discontinued. Toxicities were predominantly grade 1–2, including fatigue (67%), diarrhoea (42%), nausea (29%), and stomatitis (17%). No patients experienced >G1 hyperglycaemia. No grade 3 or 4 toxicities were reported.

Outcomes/Conclusion: This real-world analysis reinforces the clinical utility of Capivasertib in a UK cohort with advanced ER+ breast cancer, including a substantial proportion of heavily pre-treated patients. The regimen demonstrated a favourable safety profile, with predominantly low-grade toxicities and minimal treatment discontinuations. Notably, no grade ≥3 adverse events or significant hyperglycaemia were observed, aligning with findings from CAPItello-291 despite differences in patient baseline characteristics. These results support the feasibility of Capivasertib in routine practice and highlight its tolerability even in later-line settings. Ongoing follow-up and incorporation of patient-reported outcomes will be critical to capturing the full spectrum of tolerability and informing future treatment optimisation.

Category: Clinical Audit

ID - Country: 11960 - Canada

System Safeguards to Mitigate Severe Harm and Death Involving 5 Fluorouracil and Capecitabine

Alice Watt[1] and Vimal Scott Kapoor[2]
[1]*ISMP Canada*
[2]*University of Toronto, Markham-Stouffville Hospital*

Introduction: ISMP Canada recently published a health care provider bulletin and consumer newsletter highlighting the risk of severe toxicity associated with systemic 5-fluorouracil (5-FU) or capecitabine therapy when administered to patients with dihydropyriidine dehydrogenase (DPD) deficiency.

Aims/Objectives: This presentation will summarize the findings within the bulletin and newsletter and by the end of the presentation, participants will be able to:

1. Describe the risks associated with systemic 5-fluorouracil and capecitabine therapy to patients with dihydropyrimidine dehydrogenase (DPD) deficiency.
2. Hear a real-life story from a family member of a patient who was impacted by 5-FU toxicity due to DPD deficiency
3. Learn about six system-level safeguards to prevent harm from these medications due to DPD deficiency

Study Design/Methods: A cluster analysis of incidents described in the reports submitted to Health Canada (n = 10)* and the incidents submitted to ISMP Canada (n = 3) identified three scenarios:

1. Unknown risk of DPD deficiency before 5-FU or capecitabine treatment
2. Lack of pre-treatment pharmacogenetic testing to identify the extent of DPD deficiency in the presence of known risk factors (e.g., family history, ethnicity)

3. Inability of pre-treatment pharmacogenetic testing to detect clinically relevant gene variant(s)

Analysis of the adverse reaction reports (submitted to Health Canada) and the medication incident reports (submitted to ISMP Canada) identified the following potential contributing factors:

- Limited health care providers' awareness of pre-treatment pharmacogenetic testing and its limitations
- Missed opportunities for early identification of toxicity and treatment of overdose
- Limited patient and caregiver knowledge related to DPD deficiency and availability of testing, and when to seek immediate medical attention

Discussion of results/outcomes: Most of the reports described the onset of severe symptoms within a week of the first cycle of therapy. Among patients who died, the death occurred within 1 to 2 weeks of symptom onset. None of the reports mentioned the antidote.

The analysis yielded 6 key system-level safeguards that can be put in place to help prevent and mitigate harm due to fluoropyrimidine toxicity:

- Health care provider awareness and education
- Patient and caregiver engagement
- Pre-treatment testing and interpretation
- Therapeutic drug monitoring
- Early recognition of signs and symptoms of toxicity
- Consideration of the antidote and rapid access to it

Incident reporting and feedback to provincial/national bodies support the recognition of important risks to patients and inform actions for improvement. Multiple system safeguards are required to support the coordinated work of policy-makers, researchers, oncology and health care organizations, oncology care teams, and patient and caregiver advocates, to prevent or mitigate harm from fluoropyrimidine toxicity

References

1. Canada Vigilance Program. Systemic fluoropyrimidines and severe toxicity in patients with dihydropyrimidine dehydrogenase deficiency. In: Health Product InfoWatch. Ottawa (ON): Health Canada. 2025 Mar [cited 2025 May 23]. pp. 3-4. Available from: www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/health-product-infowatch/march-2025.html#a2.1.1
2. CPIC Guideline for Fluoropyrimidines and DPYD. Stanford (CA) and Memphis (TN): Clinical Pharmacogenetics Implementation Consortium (CPIC). 2024 Mar [cited 2025 Jul 17]. Available from: https://cpicpgx.org/guidelines/guideline-for-fluoropyrimidines-and-dpyd/
3. Pratt VM, Cavallari LH, Fulmer ML, Gaedigk A, Hachad H, Ji Y, et al. DPYD genotyping recommendations: a joint consensus recommendation of the Association for Molecular Pathology, American College of Medical Genetics and Genomics, Clinical Pharmacogenetics Implementation Consortium, College of American Pathologists, Dutch Pharmacogenetics Working Group of the Royal Dutch Pharmacists Association, European Society for Pharmacogenomics and Personalized Therapy, Pharmacogenomics Knowledgebase, and Pharmacogene Variation Consortium. J Mol Diagn. 2024;26(10):851-863.
4. Wu A, Anderson H, Hughesman C, Young S, Lohrisch C, Ross CJD, et al. Implementation of pharmacogenetic testing in oncology: DPYD-guided dosing to prevent fluoropyrimidine toxicity in British Columbia. Front Pharmacol. 2023;14:1257745.
5. Dihydropyrimidine dehydrogenase (DPD) deficiency testing for patients receiving 5-flurouracil and capecitabine. Ottawa (ON): Canada's Drug Agency. 2025 Jun 10 [cited 2025 Jul 17]. Available from: https://www.cda-amc.ca/dihydropyrimidine-dehydrogenase-deficiency-testing-patients-treated-5-fluorouracil-and-capecitabine

Category: Research

ID - Country: 11616 - Germany

A Comparison Of The Indications Of Novel Antiandrogens Approved By The Ema, Fda, And Tmmda: What Are The Restrictions In Drug Labels In Different Regions?

Esin Aysel Kandemir[1]
[1]*Carl von Ossietzky University of Oldenburg*

Introduction and Aims/Objectives: Novel antiandrogens gained an increased use in many countries in the last 10 years, with new indications being added continiuously. Drug regulatory agencies are responsible for the approved indications and these indications may change from one country to another depending on both clinical trial data and national strategic approaches. This study aimed to make a cross-border comparison of the indications of novel antiandrogens approved by the European Medicines Agency (EMA), Food and Drug Administration (FDA), and Turkish Medicines and

Medical Devices Agency (TMMDA) and to determine how far they are in alignment with the clinical trial data.

Study Design/Methods: Product labels of abiraterone, enzalutamide, darolutamide, apalutamide, abiraterone in combination with niraparib from EMA, FDA, and TMMDA were reviewed. Clinical trial data leading to these approvals were reviewed to match the indications with the evidence in the clinical trials. Restriction is defined as any specification in the indication that reduces the number of eligible patients for that indication.

Results/Outcomes: FDA has the lowest amount of restricted indications (n=1) in drug labels followed by EMA (n=7) and TMMDA (n=8 restricted indications and n=2 unapproved indications). The restrictions by the EMA were mostly due to prioritization of chemotherapy (n=3), high risk for developing metastatic disease (n=3), unsuitability for salvage radiotherapy (n=1), germline and/or somatic BRCA1/2 mutation (n=1). The restrictions by the TMMDA were due to ECOG 0-1 (n=3), no visceral metastases (n=3), high risk for developing metastatic disease (n=3), prioritization of chemotherapy (n=2), high volume disease (n=1), and no previous chemotherapy (n=1). Enzalutamide is contraindicated in patients with previous abiraterone use only in the TMMDA label while FDA label was the only one required selecting patients based on FDA-approved test for abiraterone use in combination with niraparib. Besides, abiraterone/niraparib combination for the treatment of metastatic castration resistant prostate cancer (mCRPC) and enzalutamide for the treatment of non-metastatic castration sensitive prostate cancer (nmCSPC) are not approved by the TMMDA. There were two cases of restriction without evidence base. Prioritization of chemotherapy for enzalutamide use for the treatment of mCRPC was not evidence based (EMA and TMMDA labels) since newer clinical trials confirmed effectiveness in chemotherapy-naive patients (PREVAIL and TERRAIN trials). Prioritization of chemotherapy for the use of abiraterone and niraparib for the treatment of BRCA mutated mCRPC was not evidence based because MAGNITUDE trial did not necessitate prior chemotherapy use, although EMA label included this as a restriction.

Discussion of results/outcomes: The results highlight the institutional differences in different regions. While most of the restrictions have their evidence base from clinical trials they can decrease access to cancer drugs. However, patients might still get acces to these therapies using off-label options due to physicians' tendency to follow international guideline recommendations which could increase the paperwork in the clinical practice. Therefore, the effects of restricted indications should be further researched. Future studies should focus on the effects of labeling on the treatment outcomes including treatment success, survival time, quality of life and costs.

Category: Research

ID - Country: 13958 - Australia

A PEG-uliar Case of Anaphylaxis: When the Allergen isn't the Active Ingredient

mehak mangat[1]
[1] *St Vincent's Hospital Melbourne Public*

Objective: To describe a sentinel event involving a polyethylene glycol (PEG) excipient allergy and highlight the role of pharmacists in identifying and preventing excipient-related hypersensitivity.

Clinical Features: A 63-year-old male with non-resectable oesophageal cancer presented for his first cycle of paclitaxel-based chemotherapy. Three minutes into the infusion, he experienced anaphylaxis and cardiopulmonary arrest. A code blue was initiated and the patient was successfully resuscitated and transferred to Emergency. His prior history obtained from another hospital included anaphylaxis to Movicol® and metoclopramide tablets.

Literature Review: PEG is a widely used excipient in medications and vaccines, yet remains a rarely recognised allergen. Reactions can be severe and life-threatening, but may be misattributed to active ingredients. Most prescribing and dispensing systems list only active ingredients, making proactive identification of cross-reactivity risks difficult to detect. Literature supports the need for standardised approaches to diagnosis, documentation, and management of excipient allergies.

Pharmacist Interventions, Case Progress and Outcomes: The Medicines Information Pharmacist reviewed the case and identified that Movicol® contains PEG, and metoclopramide tablets contain a structurally-similar excipient. PEG allergy was considered the differential diagnosis and initiated a local sentinel event investigation. The case prompted a review of chemotherapy dispensing workflows, allergy documentation practices, and highlighted limitations in digital systems that lack excipient visibility. The patient was referred for formal allergy testing, confirming PEG allergy.

Discussion: This case underscores the critical role of pharmacists in identifying excipient-related risks. Broader issues include low awareness, fragmented allergy documentation, and lack of system support for

excipient alerts. National collaboration is needed to improve prescriber education, enhance Electronic Medical Record (EMR) functionality, and develop clinical guidelines for suspected excipient allergy. PEG and other excipients may be uncommon allergens, but their consequences can be severe – and preventable.

Category: Research

ID - Country: 11584 - Kenya

An assessment of treatment outcomes among hepatocellular carcinoma patients at Kenyatta National Hospital

Amsalu Degu[1] and Bonaya Hiribae[1]
[1]*United States International University-Africa*

Introduction and Aims/Objectives: Despite several reports of poor treatment outcomes for hepatocellular carcinoma, there is a paucity of data about the treatment outcomes of this cancer in our setting. Hence, this study aimed to investigate the treatment outcomes of hepatocellular carcinoma patients at Kenyatta National Hospital.

Study Design/Methods: A hospital-based retrospective cohort study was conducted on 73 eligible hepatocellular carcinoma patients treated at the facility from 1st January 2017 to 31st December 2022. To obtain relevant data from the files of the patients, the study used a data abstraction tool. The collected data were analyzed using the Statistical Package for Social Sciences, version 20.0 statistical software. The Kaplan-Meier survival analysis and Cox proportional hazard regression were used to assess the median survival time and predictors of mortality, respectively.

Results/Outcomes: More than half of the patients were deceased (61.6%) after treatment. Furthermore, most patients had evidence of distant metastasis (58.9%), disease relapse (53.4%) and disease progression (46.6%) during the follow-up period. The median cancer-specific survival time was 20.8±2.6 months. On the other hand, the cancer-specific survival after metastasis and metastasis-free survival were 14.0±2.4 months and 19.6±4.7 months, respectively. Patients with distant metastasis (AOR=2.5, 95%CI=0.2-0.3, $p<0.001$) and received chemotherapy (AOR=3.6, 95%CI=1.4-9.0, $p=0.007$) had a higher hazard of mortality.

Discussion of Results/Outcomes: The study revealed a poor prognosis, with over half of the patients dying during follow-up and high rates of distant metastasis, relapse, and disease progression. The relatively short median cancer-specific survival of 20.8 months and even shorter survival after metastasis (14.0 months) highlight the aggressive nature of the disease. The finding that metastasis and receipt of chemotherapy were associated with higher hazards of mortality suggests that most patients presented at advanced stages, where treatment was largely palliative rather than curative.

Conclusion and implications: Most of the patients had distant metastasis, disease progression and deceased during their last follow-up period, showing a poor treatment outcome. Distant metastasis and chemotherapy were the significant predictors of mortality. Hence, treatment strategies should be shifted from conventional chemotherapy to more effective targeted therapies to reduce mortality and disease progression.

Category: Research

ID - Country: 13894 - Ghana

Ancestry-Aware Modeling of Dark CPD Formation in Skin Using GTEx Transcriptomics

Kingsley Essel Arthur[1]
[1]*Entrance University of Health Sciences*

Introduction and Aims/Objectives: Ultraviolet (UV) radiation induces cyclobutane pyrimidine dimers (CPDs) in DNA, driving mutagenic processes that contribute to photocarcinogenesis, including melanoma and non-melanoma skin cancers. Notably, "dark-CPDs" form hours post-irradiation via melanin-mediated chemiexcitation, where melanin, while photoprotective, generates oxidative by-products that paradoxically prolong DNA damage in melanocytes. Existing models often overlook ancestry-related variations in pigmentation genetics, leading to Eurocentric biases in dermatogenomic risk assessment. This study aims to empirically validate an ancestry-stratified computational framework integrating population pigmentation genetics with transcriptional regulation of DNA-repair pathways, using Genotype-Tissue Expression (GTEx v9) skin RNA-seq data, to predict dark-CPD risk and inform equitable oncology prevention strategies.

Study Design/Methods: We analyzed RNA-seq data from 604 GTEx donors, comparing sun-exposed (lower leg) and non-exposed (suprapubic) skin samples across inferred ancestry axes. Key gene modules included melanin synthesis pathways (TYR, TYRP1, SLC24A5, MC1R) and nucleotide-excision/oxidative-repair genes (XPC, DDB2, POLH, OGG1). Differential expression analysis was performed using DESeq2, with ancestry stratification via principal component analysis.

A random-forest regression model was trained to predict a composite dark-CPD risk index (derived from literature-weighted expression proxies for melanin oxidation and repair efficiency). Model performance was evaluated via 1,000-fold bootstrapping for uncertainty quantification, including R^2, RMSE, and 95% confidence intervals. All analyses were conducted in R (v4.3.1) with packages randomForest and boot, ensuring reproducibility on public GTEx data (ethical approvals inherent to GTEx consortium).

Results/Outcomes: POLH and DDB2 exhibited significant upregulation in sun-exposed tissues (log2 fold-change = 0.88 ± 0.12 and 0.64 ± 0.18; FDR < 0.05), indicating adaptive repair responses. Pigmentation genes like SLC24A5 and TYR showed ancestry-linked expression gradients aligning with prior genome-wide association studies (GWAS). The random-forest model achieved a mean R^2 of 0.62 ± 0.04 and RMSE of 0.21 ± 0.03 (95% CI), with feature importance highlighting SLC24A5 (27%) and XPC (19%) as dominant predictors of dark-CPD risk.

Discussion of Results/Outcomes: These findings demonstrate co-regulation between pigmentation and DNA-repair pathways, modulated by ancestry, within robust transcriptomic uncertainty bounds. The model's predictive accuracy underscores the melanin paradox in diverse populations, where higher eumelanin (common in non-European ancestries) may enhance dark-CPD formation despite initial UV protection. Limitations include reliance on bulk RNA-seq (potential single-cell resolution in future) and absence of direct CPD assays, though GTEx's real-world exposure gradients strengthen ecological validity.

Conclusion and Implications: This ancestry-aware framework provides a reproducible platform for equitable dermatogenomic risk modeling, with direct implications for oncology pharmacy practice. It could guide pharmacist-led personalized photoprotection counseling, ancestry-informed pharmacogenomic screening for skin cancer therapies (e.g., targeted inhibitors), and global health equity in preventing UV-related malignancies. Future validation with clinical cohorts may enable integration into oncology workflows.

References

Fajuyigbe D, Lwin SM, Diffey BL, Baker R, Tobin DJ, Sarkany RP, et al. Dark cyclobutane pyrimidine dimers are formed in the epidermis of Fitzpatrick skin types I/II and VI in vitro after exposure to solar-simulated radiation. Pigment Cell Melanoma Res. 2021;34(3):575–584. doi:10.1111/pcmr.12956

Lawrence KP, Douki T, Sarkany RP, Acker S, Herzog B, Young AR. The UV/visible radiation boundary region (385–405 nm) damages skin cells and induces "dark" cyclobutane pyrimidine dimers in human skin in vivo. PLoS One. 2018;13(9):e0202753. doi:10.1371/journal.pone.0202753

Jablonski NG, Chaplin G. Human skin pigmentation as an adaptation to UV radiation. Proc Natl Acad Sci U S A. 2010;107(Suppl 2):8962–8968. doi:10.1073/pnas.0914628107

Grether-Beck S, Marini A, Jaenicke T, Krutmann J. Photoprotection of human skin beyond ultraviolet radiation. Photodermatol Photoimmunol Photomed. 2015;31(3):167–180. doi:10.1111/phpp.12151

Premi S, Wallisch S, Mano CM, Weiner AB, Bacchiocchi A, Wakamatsu K, et al. Chemiexcitation of melanin derivatives induces DNA photoproducts long after UV exposure. Science. 2015;347(6224):842–847. doi:10.1126/science.1256022

Category: Research

ID - Country: 13895 - Nigeria

Anti-neoplastic medicine use and side effects among breast cancer patients assessing care at a tertiary Hospital in Nigeria

Felicia Esemekiphoraro Williams[1], Stella Folajole Usifoh[2] and Valentine Uche Odili[2]

[1]*University of Ilorin*

[2]*University of Benin, Benin City*

Introduction and Objectives: Breast cancer (BCa) is the second most common cancer globally. BCa can be managed through surgery, radiation therapy and pharmacotherapy (use of ant-ineoplastic medicines [AMs]) which can be used alone or in combination. There are recent advances in the use of pharmacotherapy of BCa. This has necessitated this study. Thus, this study assessed anti-neoplastic medicine use and side effects among breast cancer patients (BCaPs) assessing care at a tertiary hospital in Nigeria.

Methods: It was a cross-sectional prospective and retrospective study. This study used structured questionnaire that was adapted from previous studies. This was interviewer-administered to consented 102 eligible BCaPs to obtain their sociodemographic and clinical characteristics. Further clinical and treatment characteristics were abstracted from the patients' medical records. Data entry and analyses were through use of Statistical Package for Social Sciences (SPSS) version 25. Data analyses involved descriptive and inferential statistics (Chi-Square association tests). Statistical significance was set at $p < 0.05$. The hospital's Ethical Review

Committee granted approval for this study (ERCPAN/2022/02/0245).

Results: Mean age of study participants (SPs) was 51.75 years (SD = 12.2), 80.3% were married, and only 12.7% were enrolled with the National Health Insurance Authority. Modal monthly income class was less than N30,000 ($72.29) and 32.2% had business as their occupation. Median weights, heights, and body surface area (BSA) were 65.6kg, 161.4cm and 1.7 respectively. Majority of the SPs (57.8%) were on stage III BCa, and 14.7%, 9.8% and 4.9% were oestrogen positive, human epidermal growth factor receptor 2 positive, progesterone positive respectively. SPs' duration of illness since diagnosis (DISD) ranged 0.5 – 25 years and 53.9% had comorbidities. Regarding treatment features of SPs, 96.0% had chemotherapy (CT) of which 64.0% were administered as adjuvants, 30.4% had HT and 2.0% had TT. The modal CT cycle was 6. Half of the SPs had mastectomy while 7.8 % had radiation therapy. Combination therapy was administered to 50.0% of which 13.7% had combination therapy of AMs+mastectomy+radiation therapy. CT that was used by the SPs included docetaxel+epirubicin+cyclophosphamide (33.3%) and docetaxel+doxorubicin+cyclophosphamide (12.7%). Capecitabine 500mg was administered as an adjuvant monotherapy. HT used as adjuvant therapy by SPs were letrozole and tamoxifen while TT used was trastuzumab. Bivariate analyses showed that AMs that SPs used were associated with their DISD ($p = < 0.001$). More than 50% experienced side effects (SEs) such as depression, alopecia, loss of appetite, insomnia, fatigue and nausea.

Discussion: The SPs' use of Pharmacotherapy in combination with radiotherapy and surgery and chemotherapy combination regimen are in line with recent advances in the management of BCa. The SEs experienced by the patients are usually associated with AMs but could result in non-adherence to AMs use. This calls for appropriate and adequate patients counselling and education (PCE).

Conclusion: BCaPs were on CT, HT and TT. In some cases, anti-neoplastic medicines were used in combination with surgery and radiation therapy. Periodic studies on AMs use should be conducted to keep track of compliance with recent advances in BCa pharmacotherapy. Oncology pharmacist should provide appropriate and adequate PCE.

References

1. Santos RL, Osorio-de-Castro CG, Sobreira-da-Silva MJ, Pepe VL. First use of antineoplastic agents in women with breast cancer in the state of Rio de Janeiro, Brazil. Frontiers in Pharmacology. 2023 Feb 6;14:1069505.
2. Balkhi B, Alqahtani S, Altayyar W, Ghawaa Y, Alqahtani Z, Alsaleh K, Asiri Y. Drug utilization and expenditure of anticancer drugs for breast cancer. Saudi Pharmaceutical Journal. 2020 Jun 1;28(6):669-74.

Category: Research

ID - Country: 12566 - Singapore

Artificial Intelligence (AI) - generated oncology patient education videos: Perceptions among patients and caregivers

Yi Chen Tsai[1], Tan Matthew[1], Jia Cheng Wan[1], Jia Yin Emma Chew[2], Zhi Yao Chan[1] and Lay Woon Marion Lim[2]

[1]National University Hospital
[2]National University of Singapore

Chemotherapy counselling is essential for helping cancer patients and their caregivers understand treatment goals, manage side effects, and maintain adherence. However, conventional face-to-face counselling often faces challenges such as time constraints, information overload, and difficulty in retention. To address these issues, this study explored the use of generative artificial intelligence (GenAI)–produced videos—AI-generated video education (AiVE)—as a tool to complement traditional chemotherapy counselling at the National University Cancer Institute, Singapore (NCIS). The quality improvement study aimed to evaluate how patients and caregivers perceived the effectiveness, clarity, and emotional impact of these GenAI-generated videos in enhancing chemotherapy education and self-management.

A prospective, two-arm parallel study was conducted among oncology patients and caregivers initiating chemotherapy with paclitaxel, pembrolizumab, or nivolumab. Participants were assigned to either the intervention arm, which received pharmacist-validated GenAI video counselling, or the comparator arm, which received traditional face-to-face education (TE). Pre- and post-intervention surveys assessed changes in treatment knowledge, confidence, and preparedness. Feedback questionnaires captured perceptions of clarity, usefulness, and engagement. Quantitative data were analysed using non-parametric tests to compare changes in knowledge between groups, while qualitative feedback underwent thematic analysis to identify common sentiments and experiences.

A total of 80 participants were enrolled, with 45 receiving AiVE and 35 receiving TE. Both groups demonstrated statistically significant improvement in chemotherapy knowledge and confidence after counselling ($p < 0.05$). However, there was no statistically significant difference in the magnitude of improvement between the two groups ($p = 0.553$), possibly implying that GenAI-based video counselling was non-inferior to traditional education. More than 90 % of participants reported clear understanding of chemotherapy information following counselling, and most described the videos as engaging and easy to follow. Caregivers noted that the videos were especially helpful for reinforcing key messages and reviewing content at their convenience. Participants appreciated the human-like avatar and colloquial accent, which made the counselling feel familiar and reassuring.

Thematic analysis of qualitative responses revealed several consistent insights. Participants valued the clarity and accessibility of the information, noting that visual and verbal explanations improved comprehension of complex treatment details. Also, they highlighted the emotional comfort of having an on-demand resource that could be re-watched with family members, helping reduce anxiety and strengthen confidence. Participants viewed AiVE as a complementary tool, reinforcing rather than replacing human counselling. They recognised that pharmacists' personal interaction remains vital for addressing individual questions and providing empathy —elements that AI, while efficient, cannot fully replicate. Finally, the potential for scalability and standardisation was acknowledged, suggesting that such videos could make chemotherapy education more consistent and accessible across patient populations.

In conclusion, GenAI-generated patient education videos demonstrated high acceptability and effectiveness among oncology patients and caregivers, achieving comparable knowledge gains to traditional pharmacist-led counselling. These findings suggest that AiVE can serve as a valuable adjunct to existing patient education strategies, offering consistent, scalable, and patient-centred communication while reinforcing human care. As healthcare continues to embrace digital innovation, AI-enabled tools such as AiVE hold promise for empowering patients and caregivers with greater understanding, confidence, and engagement in their cancer treatment journey.

References

1. Hahn CA, Fish LJ, Dunn RH, Halperin EC. Prospective trial of a video educational tool for radiation oncology patients. Am J Clin Oncol. 2005;28(6):609–612.
2. Gabbard T, Perissinotti AJ, Benitez LL, Fraga M, Pettit KM, Bixby DL, et al. Impact of chemotherapy educational videos for patients with acute myeloid leukemia. J Cancer Educ. 2024. doi:10.1007/s13187-024-02473-2
3. Deshpande N, Wu M, Kelly C, Woodrick N, Werner DA, Volerman A, Press VG. Video-based educational interventions for patients with chronic illnesses: systematic review. J Med Internet Res. 2023;25:e41092.
4. Habicht J, Dina L, McFadyen J, Stylianou M, Harper R, Hauser TU, Rollwage M. Generative AI–enabled therapy support tool for improved clinical outcomes and patient engagement in group therapy: real-world observational study. J Med Internet Res. 2025;27:e60435.
5. Valenti RB. Chemotherapy education for patients with cancer: a literature review. Clin J Oncol Nurs. 2014;18(6):637–640.

Category: Research

ID - Country: 13979 - Morocco

Artificial Intelligence for the Management of Chemotherapy-Induced Adverse Effects: Clinical Applications and Perspectives

Yassine Eddahoumi[1], Hind Qajia[1], Oumaima Elqabissi[1], Lamyae Yachi[1], Soumaya Mousannif[1] and Mustapha Bouatia[1]

[1]Faculty of Medecine And Pharmacy of Rabat

Background: Undesirable effects of chemotherapy, including neutropenia, neuropathy, and nausea, frequently compromise treatment efficacy and patients' quality of life. Artificial intelligence (AI) offers innovative approaches for proactive and personalized management of these toxicities through advanced predictive models and real-time clinical monitoring systems.

Objective: To present recent advances in AI applications for predicting, monitoring, and managing chemotherapy-induced adverse effects, while evaluating their clinical impact and limitations.

Methods: A systematic review of published studies between 2020 and 2024 was conducted using PubMed and Scopus databases. The review included 12 clinical trials testing predictive models based on machine learning and deep learning algorithms, five studies on AI platforms in clinical practice (ChemOA, OncoBot), and analyses of patient-reported outcomes (PROs) and biometric data.

Results: Three major areas of advancement were identified. First, in early prediction, LSTM (Long Short-Term Memory) models demonstrated the ability to predict neutropenia 72 hours in advance with an area under the curve (AUC) of 0.89. A significant reduction in hospitalizations was observed, comparable to results reported by Chen et al. in 2022. Second, regarding real-time monitoring, chatbots like OncoBot successfully reduced toxicity reporting delays by 40% while detecting neuropathy with 88% precision. Third, in therapeutic adjustments, posological adaptation algorithms decreased treatment interruptions by 30%.

Challenges: Several significant limitations were identified, including bias from underrepresentation of aged populations in training datasets, limited interoperability with existing hospital information systems, and variable acceptability among clinicians who may be hesitant to adopt AI-driven recommendations.

Conclusion: AI represents a revolutionary approach to toxicity management in oncology, demonstrating substantial potential for improving patient outcomes and quality of life. However, its successful implementation requires clear regulatory frameworks and interdisciplinary collaboration among oncologists, pharmacists, data scientists, and healthcare administrators. Large-scale randomized controlled trials are essential to validate these tools in diverse clinical settings and patient populations before widespread clinical adoption. Future research should focus on addressing data bias, improving system integration, and establishing standardized protocols for AI implementation in chemotherapy management.

Category: Research

ID - Country: 13982 - Morocco

Artificial Intelligence in Oncology Pharmaceutical Education: Innovations and Challenges

Yassine Eddahoumi[1], Oumaima Elqabissi[1], Hind Qajia[1] and Mustapha Bouatia[1]
[1]Faculty of Medecine and Pharmacy of Rabat

Background: Artificial intelligence (AI) is revolutionizing healthcare education, particularly in oncology pharmacy, where the complexity of treatments and rapid evolution of protocols necessitate advanced pedagogical tools. The integration of AI-driven educational platforms offers unprecedented opportunities to enhance learning experiences, improve clinical decision-making skills, and prepare future oncology pharmacists for the challenges of modern cancer care. However, the implementation of these technologies faces significant barriers including bias in training algorithms, accessibility issues, and ethical considerations that must be addressed to ensure equitable and effective education.

Objective: To evaluate the contribution of AI in training future oncology pharmacists by analyzing its applications in clinical simulations, adaptive learning systems, specialized chatbots, and predictive analytics, while examining the limitations and ethical challenges associated with these innovations.

Methods: A comprehensive review of recent publications (2020-2024) was conducted using PubMed and Google Scholar databases, supplemented by conference proceedings in pharmaceutical education. Search terms included "AI," "pharmacy education," "oncology training," and "virtual patients." Studies were selected based on their relevance to AI applications in oncology pharmacy education and their methodological rigor.

Results: Four major areas of AI impact on oncology pharmacy education were identified. First, in clinical simulations, AI platforms such as OncoSim demonstrate improved mastery of complex therapeutic regimens, including immunotherapy and targeted therapies. These virtual patient simulations provide realistic clinical scenarios that allow students to practice decision-making in a safe environment without risk to actual patients. Second, adaptive learning algorithms identify individual knowledge gaps and personalize educational content accordingly, with specific applications in managing adverse drug reactions and providing patient counseling. These systems continuously adjust difficulty levels and content presentation based on individual student performance, optimizing learning efficiency.

Third, specialized chatbots, exemplified by OncoBot, provide immediate responses to students' questions regarding drug interactions and clinical guidelines from organizations such as the American Society of Clinical Oncology (ASCO) and the European Society for Medical Oncology (ESMO). These AI assistants are available 24/7, offering instant access to evidence-based information and supporting self-directed learning. Fourth, predictive analytics using machine learning assess student difficulties with key competencies including dosage calculations and patient counseling, enabling early intervention and targeted support for struggling students.

Challenges: Despite these promising applications, several significant limitations were identified. Algorithmic bias remains a major concern, as AI systems trained on non-representative datasets may perpetuate existing

healthcare disparities and fail to address diverse patient populations adequately. Accessibility issues pose another barrier, as not all educational institutions have the financial resources or technical infrastructure to implement sophisticated AI platforms, potentially creating educational inequalities. Ethical considerations surrounding data privacy, student surveillance, and the appropriate balance between AI assistance and independent clinical reasoning require careful attention and institutional policies.

Conclusion: AI offers substantial opportunities to optimize oncology pharmacy education by providing personalized, interactive, and evidence-based learning experiences that better prepare students for complex clinical practice. However, successful deployment requires a multidisciplinary approach involving close collaboration between educators and data scientists to ensure pedagogical soundness, ethical implementation, and alignment with professional competencies. Future research should focus on developing clear regulatory frameworks, establishing best practices for AI integration

References

Masters K. Artificial intelligence in medical education. Med Teach. 2019;41(9):976-80. doi:10.1080/0142159X.2019.1595557

Sit C, Srinivasan R, Amlani A, Muthuswamy K, Azam A, Monzon L, et al. Attitudes and perceptions of UK medical students towards artificial intelligence and radiology: a multicentre survey. Insights Imaging. 2020;11(1):14. doi:10.1186/s13244-019-0830-7

Wartman SA, Combs CD. Reimagining medical education in the age of AI. AMA J Ethics. 2019;21(2):E146-52. doi:10.1001/amajethics.2019.146

Kolachalama VB, Garg PS. Machine learning and medical education. NPJ Digit Med. 2018;1:54. doi:10.1038/s41746-018-0061-1

Chan KS, Zary N. Applications and challenges of implementing artificial intelligence in medical education: integrative review. JMIR Med Educ. 2019;5(1):e13930. doi:10.2196/13930

Category: Research

ID - Country: 13925 - Egypt

Assessing Pharmacovigilance Knowledge, Attitudes, and Practices (KAP) among Clinical Pharmacy Trainees of Egyptian Board, Nasr City Cancer Center (NCCC)

Mohamed ElSayed AbdelAziz AbdelAty[1]
[1]*Nasr City Cancer Center (NCCC)*

Introduction: Pharmacovigilance (PV) is critical in oncology due to the high risk of adverse drug reactions (ADRs) and medication errors. Assessing the Knowledge, Attitudes, and Practices (KAP) of clinical pharmacy trainees, the future workforce, is essential for identifying educational gaps and improving patient safety.

Objectives: This study aimed to evaluate the KAP regarding pharmacovigilance among trainees of the Egyptian Board of Clinical Pharmacy enrolled in pharmacovigilance rotation at Nasr City Cancer Center (NCCC).

Methods: A cross-sectional survey was conducted among a cohort of 37 pharmacy trainees during their pharmacovigilance rotation at the NCCC between July 2024 and July 2025. A well-established questionnaire was developed to collect data on trainee demographics, foundational PV knowledge (assessed via a score and specific questions), attitudes towards patient safety, and self-reported practices and perceived barriers. Data was compiled and descriptive statistics were used to analyze the data using Office 365 (Excel) software.

Results: The response rate was 100% (n=37). The cohort was predominantly female (91.9 %) and 67.6 % reported having previous clinical pharmacy practice. Knowledge scores were generally high, with a median score of 13.0 (IQR 3.0). Trainees demonstrated strong specific knowledge: 97.3 % correctly defined pharmacovigilance, 94.6 % identified the Yellow Card Scheme, and 86.5 % correctly named the Egyptian Drug Authority (EDA) as the responsible regulatory body. Attitudes were overwhelmingly positive: 100 % of trainees agreed or strongly agreed that PV is essential in clinical practice, and 97.3 % believed further training improves patient outcomes. Regarding practice, medication regimen reviews for potential ADRs were varied: 32.4 % reported 'Always' conducting reviews, while 29.7 % reported 'Sometimes' and 13.5 % 'Rarely'. The most frequently anticipated barriers to ADR reporting were "Difficulty identifying ADRs due to overlapping symptoms with the disease" (59.5 %) and "Lack of time" (48.6 %).

Conclusion: Egyptian Board of Clinical Pharmacy trainees in this cohort possess a strong foundation of pharmacovigilance knowledge and overwhelmingly positive attitudes toward patient safety in oncology. However, a gap exists between their positive attitudes and the consistency of self-reported practices. The primary barriers identified are practical (difficulty in ADR identification) and systemic (lack of time). Future training should focus on bridging this KAP gap by providing practical strategies and tools to overcome these specific barriers,

thereby integrating PV activities more effectively into routine clinical workflow.

References

Baldo P, Fornasier G, Ciolfi L, Sartor I, Francescon S. Pharmacovigilance in oncology. Int J Clin Pharm. 2018 Aug;40(4):832-41.

Category: Research

ID - Country: 13973 - Saudi Arabia

Assessing the Safety of Immune Checkpoint Inhibitors in Hepatitis B Virus Positive Cancer Patients

Meshail Baswaid[1], Alaa Shahbar[2], Afnan Noor[3] and Danya Katlan[4]

[1]*International Medical Center*
[2]*Umm-alquraa Unvirsity*
[3]*King Faisal Specialist Hospital and Research Centre*
[4]*King Fahed armed forced hospital*

Background: Immune checkpoint inhibitors (ICIs) have revolutionized cancer treatment by enhancing anti-cancer immune responses. HBV reactivation is a known risk with immunosuppressive therapies, and there is little evidence to recommend antiviral prophylaxis in patients receiving ICIs. This study aims to assess the safety of ICIs in cancer patients with pre-existing HBV and the effectiveness of antiviral prophylaxis in preventing HBV reactivation.

Methods: This retrospective cohort study included adult patients treated with ICIs at King Fahad Armed Forces Hospital and King Abdulaziz Medical City from January 2017 to December 2022. Patients were categorized based on whether they received antiviral prophylaxis. The primary outcome was to compare HBV reactivations between cancer patients undergoing ICI treatment with and without antiviral prophylaxis. Secondary outcomes included the severity of HBV reactivation, assessed using the AASLD 2018 guidelines, the onset of HBV reactivation, HBV flare-up without reactivation, and the response to antiviral therapy following HBV reactivation.

Results: The study included 81 patients, 56 of whom received antiviral prophylaxis. The median age was 67 years in the prophylaxis group and 71 years in the non-prophylaxis group (p=0.04). HBV reactivation occurred in 2 patients (3.6%) in the prophylaxis group and 1 patient (4%) in the non-prophylaxis group (p=0.92). HBV flare-up without reactivation was more common in the prophylaxis group (26.8% vs. 8.0%, p=0.055). The median onset of HBV reactivation was 4.7 months. Patients who developed HBV reactivation and were on antivirals responded well to a combination of antiviral therapies.

Conclusion: Antiviral prophylaxis in HBV-infected cancer patients receiving ICIs did not significantly reduce the risk of HBV reactivation. However, antivirals showed a positive trend in preventing HBV flare-ups. This observed trend warrants further investigation in larger, prospective studies to establish definitive guidelines for antiviral use in this population.

Category: Research

ID - Country: 13904 - Australia

Atovaquone Dosing for Pneumocystis Jirovecii Pneumonia Prophylaxis in Practice: A Retrospective Review of Dosing Strategies

Neil Kim Chiu Lam[1] and Linda Nguyen[1]

[1]*Icon Cancer Centre, The Wesley Hospital*

Introduction: Pneumocystis jirovecii pneumonia (PJP) is a potentially life-threatening opportunistic infection in immunocompromised individuals. Patients at high risk of PJP (e.g. underlying disease, chemotherapy or immunosuppressive drugs) may require prophylactic therapy. Although trimethoprim-sulfamethoxazole is standard-of-care for PJP prophylaxis, atovaquone is an alternative for patients with sulfonamide allergy or intolerances. Australian guidelines recommend an oral atovaquone dose of 1500mg daily. However, a recent international study by Sugi et al.(1) investigated a prophylactic 750mg daily dose in lower-risk haematological patients. The aim of this study was to conduct a local audit of atovaquone dosing practices and subsequent PJP infection.

Method: A retrospective audit of patients prescribed atovaquone for PJP prophylaxis was conducted at a day oncology outpatient clinic. Ethics approval was obtained. Dispensing records from 1 January 2020 to 31 December 2024 were reviewed to identify all patients who received atovaquone. Data was collected on dose and duration. Medical records were examined for the duration of administration until the end of the observation period to determine if patients experienced a subsequent PJP infection. Statistical analysis was performed using Microsoft Excel.

Results: All patients who received atovaquone prophylaxis were included (n=88). The median age was 69 years (range 22-89). 50% of patients received low-dose atovaquone (750mg daily; n=44) whilst 50% received standard dose (1500mg daily; n=44). Treatment duration

ranged from 6-261 weeks (750mg daily) and 1-180 weeks (1500mg daily). 91% of patients in the low-dose group (n=40) were considered low-intermediate risk. No PJP was reported in the low-dose group, however there was one case of PJP in the standard-dose group during the follow-up period.

Discussion: This study found no report of PJP infection in patients on 750mg daily dosing during the prophylaxis and observation period. Most patients had haematological malignancy and considered to have low to intermediate risk of PJP infection based on eviQ guidelines.(2) Sugi et al.(1) similarly reported no development of PJP infection in lower-risk patients with haematological disease on 750mg daily dosing. Consideration of low-dose atovaquone in select patients may reduce financial burden and assist patient compliance and tolerability. Limitations of this study include the small sample size and single centre. Additionally, external atovaquone supply and patient compliance were not assessed.

Conclusion: While no PJP infections were observed in the low-dose group, further study with a larger sample and patient risk stratification is required to establish clinical implication.

References

1. Sugi T, Mita M, Kushi R, Hanai H, Uchida T, Inoue M et al. Prevention of pneumocystis pneumonia in patients with hematological disease: efficacy of low-dose atovaquone. Int J Clin Pharmacol Ther. 2023 Nov;61(11):515-519.
2. eviQ. Prophylaxis – Pneumocystis jirovecii (carinii) pneumonia in cancer patients. Updated May 19, 2023. Accessed Aug 9 2025. https://www.eviq.org.au/clinical-resources/side-effect-and-toxicity-management/prophylaxis-and-treatment/220-pneumocystis-jirovecii-pneumonia-pjp-prophyl

Category: Research

ID - Country: 13964 - Thailand

Bayesian Evidence for Psychological Improvement but Minimal Lipid Modulation: A Meta-Analysis of Continuous Outcomes in Breast and Body Weight Interventions

Karunrat Tewthanom[1]
[1] *Silpakorn University*

Introduction and Aims/Objectives: Lifestyle and weight-management interventions in breast cancer survivors may influence both metabolic and psychological health. However, evidence from traditional meta-analyses is limited by heterogeneity and small sample sizes. Using Bayesian inference, this study synthesized data to evaluate the effects of these interventions on lipid profiles and quality of life.

Study Design/Methods: A Bayesian hierarchical meta-analysis was conducted on randomized controlled trials published between 2002 and 2017 involving breast cancer or body-weight interventions (1–9). Six studies reported HDL and LDL changes, and three reported anxiety/depression and mental-health outcomes. Posterior means (μ), between-study variance (τ), 95% credible intervals (CrIs), and Bayes factors (BF_{10}) were estimated under fixed and random effects.

Results/Outcomes: Lipid outcomes: HDL ($\mu = 0.013$, 95% CrI -0.294 to 0.317; $BF_{10} = 0.17$) and LDL ($\mu = 0.164$, 95% CrI -0.148 to 0.482; $BF_{10} = 0.30$) showed minimal effects and weak evidence for change.

Psychological outcomes: Anxiety/depression subscales demonstrated moderate improvement ($\mu = -0.463$, 95% CrI -1.111 to 0.263; $BF_{10} = 1.43$), and mental-health subscales showed stronger evidence of benefit ($\mu = -0.490$, 95% CrI -0.876 to -0.131; $BF_{10} = 7.64$).

Discussion: The findings suggest limited metabolic response but consistent psychological gains following weight-related or lifestyle interventions in breast cancer survivors. Bayesian modeling allowed direct assessment of evidence strength and credible effect estimation, highlighting emotional well-being as a primary benefit.

Conclusion and Implications: Bayesian evidence indicates that behavioral and dietary interventions in breast cancer survivors improve mental health more than lipid profiles. Future programs should integrate psychological outcomes into metabolic monitoring and apply Bayesian approaches for comprehensive evaluation

References

Abrahamson PE, Gammon MD, Lund MJ, Flagg EW, Porter PL, Stevens J, Swanson CA, Brinton LA, Eley JW, Coates RJ. General and abdominal obesity and survival among young women with breast cancer. Cancer Epidemiol Biomarkers Prev. 2006;15(10):1871–7.
Thomson CA, Stopeck AT, Bea JW, Cussler E, Nardi E, Frey G, Thompson PA. Changes in body weight and metabolic indexes in overweight breast cancer survivors enrolled in a randomized trial of low-fat vs. reduced carbohydrate diets. Nutr Cancer. 2010;62(8):1142–52. doi:10.1080/01635581.2010.513803.

Mefferd K, Nichols JF, Pakiz B, Rock CL. A cognitive behavioral therapy intervention to promote weight loss improves body composition and blood lipid profiles among overweight breast cancer survivors. Breast Cancer Res Treat. 2007;104(2):145–52. doi:10.1007/s10549-006-9410-x.

Djuric Z, DiLaura NM, Jenkins I, Darga L, Jen CK, Mood D, Bradley E, Hryniuk WM. Combining weight-loss counseling with the Weight Watchers plan for obese breast cancer survivors. Obes Res. 2002;10(7):657–65. doi:10.1038/oby.2002.89.

Arikawa AY, Kaufman BC, Raatz SK, Kurzer MS. Effects of a parallel-arm randomized controlled weight loss pilot study on biological and psychosocial parameters of overweight and obese breast cancer survivors. Pilot Feasibility Stud. 2017;4:17. doi:10.1186/s40814-017-0160-9.

Category: Research

ID - Country: 13865 - Australia

Bridging the Gap: Insights from Consumers and Healthcare Professionals on Pharmacogenomics in Oncology

May Darwish[1], Sarah Glewis[2], Safeera Hussainy[3], Chelsea Lim[4], Vivian Shen[5], Jenny Devine[6], Sam Harris[7], Craig Underhill[8], Michael Michael[2], Jeanne Tie[2], Senthil Lengaratnam[9] and Marliese Alexander[2]

[1]Peter MacCallum Cancer Centre

[2]Department of Pharmacy, Peter MacCallum Cancer Centre | Sir Peter MacCallum Department of Oncology, University of Melbourne

[3]Department of Pharmacy, Peter MacCallum Cancer Centre | 2Sir Peter MacCallum Department of Oncology, University of Melbourne |6Department of General Practice, School of Public Health and Preventive Medicine, Monash University, Victoria, Australia.

[4]3Pharmacy, School of Health and Biomedical Sciences, RMIT University, Bundoora, Victoria, Australia | 4Medicine Department, School of Clinical Sciences, Monash University, Clayton, Victoria, Australia.

[5]Department of Pharmacy, Peter MacCallum Cancer Centre.

[6]5Consumer Representative, Peter MacCallum Cancer Centre, Melbourne, Victoria, Australia | 6Department of General Practice, School of Public Health and Preventive Medicine, Monash University, Victoria, Australia.

[7]Bendigo Cancer Centre, Bendigo Health, Bendigo, Victoria, Australia.

[8]8Border Medical Oncology Research Unit, Albury Wodonga Regional Cancer Centre, Albury, New South Wales, Australia | Victorian Comprehensive Cancer Centre Alliance, Melbourne, Victoria, Australia | University of NSW Rural Medical School, Albury, New South Wales, Australia

[9]Department of Pharmacy, Peter MacCallum Cancer Centre | 2Sir Peter MacCallum Department of Oncology, University of Melbourne

Introduction and Aims/Objectives: Locally informed implementation strategies are essential to bridge gaps and drive the adoption of pharmacogenomics (PGx) in oncology. This study aimed to assess PGx knowledge, perceptions, attitudes, practices, barriers, and education needs among healthcare professionals (HCPs) and consumers across Australia using validated survey tools.

Study Design/Methods: Surveys were disseminated nationally between February and December 2024 to HCPs and consumers through the PRECISION-ITS trial network and professional and consumer advocacy groups. Surveys covered six sections: introduction, demographics, experience, knowledge/attitudes/practices/perceptions, education, and clinical vignettes reflecting real-world decision-making in complex care settings. The HCP survey (71 questions) targeted doctors, nurses, and pharmacists involved in cancer care across all settings (metropolitan/regional, public/private, cancer/general hospitals and outpatient services), while the consumer survey (48 questions) targeted adults treated for cancer or their carers. Denominators varied by question.

Results/Outcomes: A total of 224 responses were received from 118 HCPs (64% pharmacists, 16% clinicians, 11% nurses) and 106 consumers (67% patients, 32% carers) in metropolitan (52%) and regional (48%) areas. HCP respondents worked in public (83%) and private (17%) sectors. Among HCPs, 70% reported fair-exceptional prior PGx knowledge, but only 30% felt adequately prepared to apply PGx in practice. Most (90%) supported PGx testing, though <50% had discussed it with patients (42%) or used results to guide treatment (47%). Key barriers were limited infrastructure (67%) and insufficient evidence (39%), while inclusion in cancer guidelines was the top enabler (45%). In clinical vignettes, responses varied by setting and HCP speciality: only around one-third of HCPs reported awareness of PGx evidence for tamoxifen in breast cancer (~37%) or indicated they would use PGx prescribing in supportive care (~30% for nausea/vomiting and pain), whereas nearly two-thirds reported use for haematologic cancer-directed therapies (~63% for thiopurines). Among consumers, 64% lacked PGx knowledge before watching an introductory educational video. After viewing, 95% believed people with cancer should have access to PGx testing, and 91% would undergo testing if available. Most consumers (76%) expressed interest in learning more about PGx, with half (52%) preferring a mix of educational formats. Consumers perceived benefits in reducing medication side effects (93%) and guiding medicine selection and dosing (90%), while concerns

about insurance (34%) and data security (32%) were less likely to deter testing.

Discussion of results/outcomes: Collectively, findings demonstrate strong support for PGx testing among both HCPs and consumers, but highlight substantial gaps in confidence, knowledge, and infrastructure. Many HCPs recognised the value of PGx for optimising prescribing and minimising toxicity, but lacked the training and resources needed to apply it effectively in practice. Among consumers, baseline awareness of PGx was low; however, after viewing the educational video there was strong support for patient access to PGx testing. Both HCPs and consumers shared common themes of limited PGx literacy yet clear recognition of its importance in advancing personalised caner care.

Conclusion and implications: This national survey, incorporating perspectives from both HCPs and consumers, highlights modifiable gaps that can be addressed through targeted implementation strategies to accelerate the integration of PGx into practice. Grant-ID: MRFFMMIP000011.

Category: Research

ID - Country: 13969 - Turkey

Cancer Patients' Digital Communication Preferences with Healthcare Professionals

Elif Aras Atik[1], Ozge Geridonmez[2], Serkan Akin[2], Sercan Aksoy[2] and Aygin Bayraktar-Ekincioglu[3]

[1]Atatürk University
[2]Hacettepe University
[3]Hacettepe University, Faculty of Pharmacy

Introduction and Aims/Objectives: Information and communication technologies are transforming the management of chronic diseases in patients . These technologies, including the internet, mobile devices, telemonitoring, and telemedicine, serve as information sources that facilitate communication between healthcare professionals and patients while enabling real-time monitoring. In this study, we aimed to evaluate information and communication devices used by cancer patients in order to assess their preferences for communication with healthcare professionals.

Study Design/Methods: This study was conducted prospectively in the outpatient clinics of the Hacettepe University Oncology Hospital between November 2024 and February 2025. The study included volunteer patients aged over 18 years who attended the outpatient clinics during this period. Written consent for participation was provided by all participants. Furthermore they were asked 18 questions to regarding the use of technological tools and communication pathways with healthcare professionals. Patients' communication preferences were evaluated in the following categories: initial treatment planning with oncologists, dose adjustments, prescription renewals, unexpected symptoms, outcomes evaluation (laboratory, imaging, etc.), obtaining information about medication, and creating medication administration reports.

Results/Outcomes: A total of 88 patients (65 % female) were included, and the mean (±standard deviation) age was 59 (±8.4) years. 25% of patients were diagnosed with breast cancer, 15% with colon cancer, 10% with lung cancer. 77.4% of patients are treated with chemotherapy. 56.2% of patients have at least one chronic disease, and cardiovascular diseases account for approximately 85% of these chronic diseases. %84.1 of patients owned a smartphone, and 51.1% of patients used their cell phones for routine communication (calls, messages, etc.) and internet access. %85 of patients stated that they frequently use the internet during daily routines. 53.4% of patients have previously researched health information online, and approximately 76% of the information sought was about disease information. 80.6% of patients use a health app on their phones. % 83.9 of patients preferred face-to-face communication with oncologists for initial treatment planning and dose adjustment; however about %25 of patient indicated email or WhatsApp communications for laboratory assessments and legal or administrative documents. Considering communication with pharmacists and nurses; it was found that about 90.3% of patients preferred face-to-face communication with pharmacists for dose adjustments and symptoms or complaints, and preferred telephone or face-to-face communication for obtaining information about the medication. No significant difference was observed between genders in terms of communication preferences with healthcare workers.

Discussion of results/outcomes: Despite the pervasive integration of technology and the internet in the daily lives of patients, the adoption of evolving information and communication technologies in hospital practice has been limited.

Conclusion and implications: Despite the continuous development of information and technology services in the healthcare system, patients in a group requiring frequent follow-up, such as cancer patients, often choose face-to-face communication, which may indicate their beliefs on digital communication cannot meet their emotional and physiological needs. Advancements in this area can be achieved through the provision of infrastructure services that facilitate effective digital communication between patients and healthcare professionals.

Category: Research

ID - Country: 13996 - United States of America

Characterization of a Suspected JAK Inhibitor Discontinuation Syndrome Following Momelotinib Cessation in Myelofibrosis

Justin Arnall[1], Benson Meek[1] and Erin Cichonski[1]
[1]*Atrium Health*

Introduction and Aims/Objectives: Momelotinib is a Janus kinase (JAK) 1/2 and activin A receptor type 1 (ACVR1) inhibitor approved in 2023 for the treatment of myelofibrosis (MF) in patients with anemia. Its unique dual mechanism suppresses hepcidin production via BMP6/ACVR1/SMAD and IL-6/JAK/STAT3 pathways, enhancing iron availability and erythropoiesis. This results in improved hemoglobin levels and reduced transfusion dependence, addressing a critical unmet need in MF-associated anemia—a major prognostic factor linked to poor survival and quality of life. While momelotinib's pivotal trials did not report significant withdrawal phenomena, real-world experience may reveal additional safety considerations. This case report describes a patient who developed symptoms consistent with JAK inhibitor withdrawal syndrome following abrupt cessation of momelotinib.

Study Design/Methods: We retrospectively reviewed the clinical course of a 74-year-old female with post-polycythemia vera myelofibrosis who experienced acute deterioration following the abrupt discontinuation of momelotinib. Clinical data were extracted from the electronic medical record, including laboratory values, imaging, and symptom documentation before, during, and after momelotinib interruption.

Results/Outcomes: The patient was transitioned from pacritinib to momelotinib 200 mg daily due to worsening anemia. Comorbidities included meningioma status post-craniotomy, deep vein thrombosis and pulmonary embolism, heart failure with reduced ejection fraction, and seizure disorder. Momelotinib led to a hemoglobin increase of 2 g/dL, though persistent pruritus prompted a temporary hold in therapy. After two weeks without improvement in pruritus, the hold was extended. Subsequently, the patient developed nausea, vomiting, early satiety, and presented to the emergency department with a seizure approximately three weeks after discontinuation. Additional findings included acute hypoxic respiratory failure, right-sided pleural effusion, heart failure exacerbation, hemoglobin decline of 1 g/dL, platelet drop of 40–50 $\times$ $10^3/\mu L$, and splenomegaly (17.6 cm on ultrasound). Momelotinib was restarted during hospitalization, resulting in rapid resolution of gastrointestinal symptoms and improvement in hematologic parameters. The patient was discharged two days later and reported feeling "poor but stable" at follow-up, with normalized hemoglobin and platelet counts.

Discussion of Results/Outcomes: This case highlights a potential withdrawal syndrome associated with abrupt momelotinib discontinuation, mirroring the well-documented ruxolitinib discontinuation syndrome (RDS). RDS is characterized by cytokine release, symptom relapse, and splenomegaly, with severe cases leading to respiratory distress and hospitalization. Notably, RDS was not well characterized during ruxolitinib's clinical development and only became widely recognized through post-marketing surveillance and case reports. Although momelotinib's pivotal trials allowed tapering at discontinuation, standardized protocols are lacking. Given momelotinib's short half-life and potent JAK inhibition, it may carry a comparable risk for withdrawal symptoms. The rapid improvement following reinitiation supports a causal relationship and underscores the importance of reporting suspected cases to better define the safety profile of newer JAK inhibitors.

Category: Research

ID - Country: 13946 - Australia

Chemotherapy Catastrophic Health Expenditure: A Comparative Analysis of Drug Affordability in Australia and the Philippines

Michael Soriano[1], Julia Abah[2], Karla Aycardo[2], Kristine Cruz[2] and Maria Fay Nenette Cariaga[2]
[1]*Chris O'Brien Lifehouse*
[2]*University of Makati, Institute of Pharmacy*

Background: Many goods and services are nominally considered cheaper in developing nations; holidays, food and healthcare, chemotherapy drugs seem to be an exemption. We wanted to see if the cost of common chemotherapy regimens would risk crossing the Catastrophic Health Expenditure (CHE) threshold in Australia and Philippines.

Objectives: This study compared the nominal and subsidised costs of two chemotherapy regimens in private tertiary hospitals in both countries, assessed the financial protection offered by the Pharmaceutical Benefits Scheme (PBS) in Australia and PhilHealth in the Philippines, and evaluated affordability and instances of catastrophic health expenditure.

Methods: A comparative cost analysis was conducted comparing nominal and post-subsidy prices of two

chemotherapy regimens AC-Paclitaxel and CAPOX. Coverage of subsidy schemes reviewed and affordability measured using minimum and median wage-based CHE calculations to determine real-world financial burden.

Results: PBS's uncapped model eliminates drug-related financial toxicity for Australian patients; PhilHealth's fixed ceiling leaves large gaps in affordability. After Philhealth subsidy, breast and colorectal cancer patients will still be out-of-pocket $3,776 and $8,915 respectively—73% and 173% of the annual minimum wage in the Philippines (55% and 130% of the median annual wage) after subsidy. Wages are not the only contributors to unaffordability; actual drug costs are also a significant contributor with CAPOX being 611% more expensive in the Philippines. Pricing unaffordability is also further compounded by the narrow scope of existing pricing regulations, in the case of capecitabine tablets in the Philippines retailing at PHP 157 on average (Australia AUD 0.66 ≈ PHP 16.24). There was no maximum retail price set in the Philippines for all medications in this study.

Discussion: Despite existing price caps and subsidies, chemotherapy remains financially toxic for many Filipino cancer patients. Weak regulatory enforcement, high retail drug costs, and capped national insurance contribute to affordability gaps, while Australia's PBS demonstrates how uncapped, regulated systems can protect patients from catastrophic out-of-pocket costs.

Category: Research

ID - Country: 14264 - United States of America

Clinical Outcomes of Diluted Recombinant Factor VIII (Advate) for Continuous Infusion in Hemophilia A: A Retrospective Evaluation

Justin Arnall[1], Mykala Woods[2], Paul C Parish[3], LeAnne Kennedy[3], Deardra Lewis[2] and Jay'la Lin[4]

[1]Atrium Health
[2]High Point University Fred Wilson School of Pharmacy
[3]Atrium Health Wake Forest Baptist Medical Center
[4]Campbell University College of Pharmacy & Health Sciences

Introduction and Aims/Objectives: Continuous infusion of factor VIII (FVIII) is an established strategy for managing bleeding episodes and perioperative care in hemophilia A, offering potential cost savings and reduced factor consumption compared to intermittent bolus dosing. However, widespread adoption has been limited by concerns regarding chemical stability and operational challenges, including syringe pump requirements. To address these barriers, our institution implemented a standardized protocol for diluting recombinant FVIII (Advate) for continuous infusion with a 24-hour beyond-use date. This study aimed to evaluate clinical outcomes, therapeutic target attainment, and dosing patterns associated with this protocol in real-world practice.

Study Design/Methods: We conducted a single-center, retrospective cohort study. Patients with hemophilia A admitted between 2012 and 2024 who received diluted Advate via continuous infusion were included. The dilution protocol specified a 24-hour beyond-use date to ensure chemical stability and safety. Patients were identified using a reporting tool within the electronic medical record, and data were collected through manual chart review. Variables included demographics, admission details, FVIII levels during infusion, bolus dosing, infusion rates, dose modifications, and adverse events. The primary outcome was the percentage of FVIII levels within the desired therapeutic range. Secondary outcomes included the proportion of supratherapeutic and subtherapeutic levels, median FVIII levels, number of bolus doses, and clinical complications such as thrombotic events or worsening bleeding.

Results/Outcomes: Sixteen patients (100% male) were included, with a median age of 26 years. Three patients (19%) had a history of inhibitors; 44% had severe hemophilia, 25% moderate, and 31% mild disease. Across 22 encounters, the median hospitalization duration was 6 days, and continuous infusion lasted a median of 72 hours. The starting infusion rate was 4 units/kg/hour, and a median of 7 FVIII levels were obtained per encounter. Indications for continuous infusion included acute bleeding (55%) and periprocedural management (45%).

Therapeutic monitoring revealed a median FVIII level of 95% during infusion. Only 28% of levels were within the target range, while 42% were supratherapeutic and 30% subtherapeutic. Notably, 70% of levels were above the lower end of the therapeutic range. The median maximum FVIII level was 147%, and the median minimum was 61%. Patients required a median of one bolus dose (range: 0–2) during infusion. No thrombotic events or worsening bleeding complications were documented.

Discussion of Results/Outcomes: These findings are encouraging and highlight the practical benefits of continuous infusion with diluted Advate. While early subtherapeutic levels were observed—likely during initial rate adjustments and active bleeding phases—FVIII levels never dropped to critically low values, minimizing bleeding risk during optimization. That most patients required only one or fewer boluses suggests that

therapeutic or supratherapeutic levels were achieved quickly. Importantly, the use of diluted Advate with a 24-hour beyond-use date did not compromise drug integrity, aligning with published stability data for FVIII concentrates. Continuous infusion of diluted recombinant FVIII using a standardized protocol with a 24-hour beyond-use date was feasible, safe, and operationally effective. These findings support broader adoption of continuous infusion strategies and encourage further research to refine dosing protocols and confirm stability data in real-world settings.

Category: Research

ID - Country: 14251 - United Kingdom

CloseHER2Home – Feasibility and Acceptability of a Community Pharmacist-led Cancer Treatment Pathway

Lisa MacLeod[1] and Katherine Cowie[2]
[1]*University of Stirling*
[2]*NHS Tayside*

Introduction: In the UK, community pharmacies defy the inverse care law [1] being more accessible than hospitals and primary care providers. The capacity to expand into cancer care is well recognised [2]. CloseHER2Home (ISRCTN15965214) was a joint working project between Roche and NHS Tayside (Scotland, UK) to assess the feasibility and acceptability of a community pharmacist-led treatment pathway (CPP) for HER2-positive breast cancer patients receiving subcutaneous trastuzumab (Herceptin®).

Method: A single-centre, non-randomised, feasibility study which recruited from August 2022 to November 2023. Eligible patients were identified via outpatient appointment lists. Consenting patients received four doses of trastuzumab in a community pharmacy; pharmacists completed pre-treatment assessment and drug administration.

Demographic data was collected to describe the participating population. Feasibility was assessed by the proportion of patients completing 4 cycles via CPP, appointment duration (pharmacy vs hospital) and nursing capacity released. Acceptability was assessed by thematic analysis of semi-structured interviews with participants.

The study was reviewed by Maggie's Dundee Breast Cancer group (2017) and approved by the East of Scotland NHS Research Ethics Committee (ref: 19/ES/0143).

Results: There were 39 eligible patients, 33% (n = 13) consented to participate CPP but 30% (n = 4) failed to start; in one instance the pharmacist's supervisor refused participation and in the remaining three sites there was no regular pharmacist employed at the preferred pharmacy.

Participants were:

–All caucasian, average age 71 (52 – 83)
–Scottish Index of Multiple Deprivation (SIMD) average 3.6 (1-5)
–Three employed, six retired
–Three on treatment to disease progression, six adjuvant

Pharmacists found trastuzumab ordering more time-consuming but reported delivery within 24–48 hours; there was one delayed appointment reported resulting from failure of the wholesaler to deliver in the agreed timeframe. Time to deliver a treatment appointment ranged from 15 to 45 minutes, averaging 28 minutes. The equivalent hospital chair/nurse time released was 45 minutes per appointment.

The distance travelled by patients to hospital was longer: mean 13.4 miles (4.7 – 33.9) compared to 3.6 miles to pharmacy (0.6 – 8.2).

Examples of Participant Experience of CPP:

–Absolutely on a par with most of the nurses and better than some. I think, all in all, it was a positive experience for me and I'd say…10 out of 10 to [the pharmacist]. (Patient 15)
–I was delighted to be part of this trial. I'm delighted that it's carrying on. It has meant a big, big change to me, in my mindset. (Patient 4)

Discussion: All participants agreed the level of care received in CPP was equivalent to hospital and chose to complete their treatment in pharmacy. The care received in hospital was highly rated but convenience, psychological benefit and continuity of care were cited as key factors in preference for the CPP.

These results provide evidence of acceptability of a CPP but are insufficient to conclude feasibility to fund a substantive service. Qualitative data generated by this project will be used alongside other sources and analysed using Realist approach[4] in combination with Normalisation Process Theory[4] to inform the design of a future CPP.

References

1. Todd A, Copeland A, Husband A, Kasim A, Bambra C. The positive pharmacy care law: an area-level analysis of the relationship between community

pharmacy distribution, urbanity and social deprivation in England. BMJ Open. 2014 Aug 12;4(8): e005764. doi: 10.1136/bmjopen-2014-005764.
2. The Royal Pharmaceutical Society, 2020 'Utilising community pharmacists to support people with cancer'. Access via: https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/00207%20001a%202001%20Cancer%20Paper%20WEB.pdf?ver=2020-01-10-093311-763
3. Pawson R, Tilley N. Realistic Evaluation. Sage, 1997.
4. Murray, E., Treweek, S., Pope, C. et al. Normalisation process theory: a framework for developing, evaluating and implementing complex interventions. BMC Med 8, 63 (2010). https://doi.org/10.1186/1741-7015-8-63

Category: Research

ID - Country: 13827 - China

Access to anti-cancer medicines: Evidence from a multi-method study in eight South Asian countries

Sundus Shukar[1], Zaheer-Ud-Din Babar[2], Caijun Yang[1] and Yu Fang[1]
[1]*Xi'an Jiaotong University*
[2]*Qatar University Qatar*

Background: South Asia experiences a substantial cancer burden alongside limited universal health coverage (UHC), and high reliance on the highest out-of-pocket expenditure among developing regions. Ensuring access to essential anti-cancer medicines remains difficult and is shaped by determinants including the National Essential Medicines List (NEML), regulatory registration, and local production, which have not been comprehensively evaluated in the region. This study assesses the inclusion of anti-cancer medicines in NEMLs, their registration, and local production in eight South Asian countries.

Methods: We conducted a multi-method study in South Asian countries. Using document analysis, we compiled regulatory data for 67 anti-cancer medicines from the 2023 World Health Organization Essential Medicines List (WHO EML) on NEML inclusion, registration, and local production, along with macro-level indicators. We reported medians and used Spearman's correlation and linear regression (SPSS v23). Semi-structured interviews were conducted with 30 drug supply chain stakeholders across six countries. The interview data were thematically analysed using NVivo 12.

Findings: Document analysis found that the median number of anti-cancer medicines included in NEMLs was 23, 45 for registered, and 6.5 for locally produced medicines. The number of locally produced anti-cancer medicines was strongly associated with higher NEML inclusion ($\rho = 0.884$, $p = 0.004$), and inversely associated with healthcare expenditure ($r = -0.732$, $p = 0.039$). More than half of the WHO EML anti-cancer medicines were included in NEMLs in three countries, and registered in six countries. However, local production was limited, and imports were dominant. Stakeholder interviews identified financial constraints, a weak regulatory system, and insufficient strategic planning as major barriers impacting availability.

Discussion: The multi-method regional analysis indicates the systemic misalignment between NEML inclusion, registration, and local production—three upstream factors within the WHO Health Systems Framework—hinders access to anti-cancer drugs in South Asia. The majority of countries are dependent on imports due to the constrained local production, even with substantial NEML and registration advancements. Coordinated policy and regulatory action may expedite access, as evidenced by the high positive association between NEML inclusion and local production. Financial Constraints, fragmented governance, and inadequate industrial capacity continue to be significant obstacles, though. Stakeholder perspectives highlighted how WHO-supported technical assistance, regional cooperation, and pooled production may improve regulatory capacity, lower costs, and guarantee sustainable access. The study highlights that progress toward equitable access to anti-cancer medicines throughout South Asia is determined by strategic policy reform rather than just economic status.

Interpretations: Access to anti-cancer medicines is restricted by systemic misalignment across a coupled pathway—NEML inclusion, registration, and local production—undermined by weak regulatory harmonization, inadequate strategic planning, and financial constraints. Regional collaboration on pooled manufacturing initiatives under WHO guidance and strategic health reforms offers a feasible way to improve access.

References

1. Jenei K, Aziz Z, Booth C, Cappello B, Ceppi F, de Vries EG, et al. Cancer medicines on the WHO Model List of Essential Medicines: processes, challenges, and a way forward. The Lancet Global Health. 2022;10(12):e1860-e6.
2. Kizub DA, Naik S, Abogan AA, Pain D, Sammut S, Shulman LN, et al. Access to and Affordability of world health organization essential medicines for cancer in sub-Saharan Africa: examples from Kenya, Rwanda, and Uganda. The oncologist. 2022;27(11):958-70.

3. Shukar S, Anjum R, Zhang J, Babar Z-U-D, Mobeen I, Yang C. Anticancer medicines in Pakistan: An analysis of essential medicines lists. Journal of Oncology Pharmacy Practice. 2024;30(1):46-54.
4. Robertson J, Barr R, Shulman LN, Forte GB, Magrini N. Essential medicines for cancer: WHO recommendations and national priorities. Bulletin of the World Health Organization. 2016;94(10):735.
5. Piggott T, Nowak A, Brignardello-Petersen R, Cooke GS, Huttner B, Schünemann HJ, et al. Global status of essential medicine selection: a systematic comparison of national essential medicine lists with recommendations by WHO. BMJ open. 2022;12(2):e053349.

Category: Research

ID - Country: 12676 - Malta

Development and Validation of pharmacist-led helpline framework for paediatric oncology

Louise Grech[1] and Sarah Marie Falzon[2]
[1]*Louise Grech*
[2]*Department of Pharmacy, Faculty of Medicine and Surgery, University of Malta*

Introduction: Pharmacists are equipped with necessary expertise and skills to provide patient-centred pharmacotherapy within an interdisciplinary approach to paediatric oncology patients. The service provision can be extended through the use of a helpline that can be utilised by inpatients and outpatients in an effort to provide sustained enhanced service provision.

Aim: To establish a pharmacist-led helpline framework aimed to support paediatric oncology patients within an interdisciplinary approach.

Method: The study was carried out at the Paediatric-Adolescent Oncology ward within Sir Anthony Mamo Oncology Centre at Mater Dei Hospital. The methodology was divided into three phases. Phase 1 focused on a literature review leading to the identification of tools to be used for the pharmacist-led helpline framework. Phase 2 centred on the development and validation of the tools. Phase 3 of the research approached the development of a quality management system including required standard operating procedure to support the implementation of the pharmacist-led helpline for paediatric oncology patients.

Results: Study outcomes from Phase 1 led to the identification of tools required to be developed to establish the framework, namely i) 'Pre-service questionnaire for healthcare professionals', ii) 'Pre-service questionnaire for parents/legal guardians', iii) 'Pharmacist-led helpline documentation sheet', iv) 'Pharmacist-led helpline referral form' and v) 'Post-service questionnaire for patients/legal guardians'. Through results of Phase 2, the Pre-Service Questionnaires intended separately for healthcare professionals (with 14 questions) and parents/legal guardians (with 13 questions) aimed to capture expectations for the pharmacist-led helpline services. The 'Pharmacist-led helpline documentation sheet' and 'the Pharmacist-led helpline Referral form' are the tools used to run the service. The 'Pharmacist-led helpline documentation sheet' consists of 13 fields capturing date and time of enquiry, enquirer information, caring consultant, medication details, description of the call, provided information, information source/s, classification of call, urgency of call, status of the enquiry and the details of the pharmacist receiving the query. The 'Pharmacist-led helpline referral form' was developed to be used in cases where the pharmacist needs to refer the case to another healthcare professional to assist the patient. The 'Post-service questionnaire for patients/legal guardians' which consists of 14 questions was developed with the intention to evaluate the pharmacist-led helpline and use it to refine the service based on feedback provided by the users. The validation panel (n=4) agreed that each document was clear, concise and relevant to its intended purpose. With respect to Phase 3, a standard operating procedure consisting of 6 main sections including applicability of the standard operating procedure, purpose and scope, training requirements, responsibilities and procedure to provide a harmonised service.

Discussion: The developed pharmacist-led helpline framework encapsulates tools required to run a holistic service that is specifically targeting to paediatric oncology patients to address patient centred pharmacotherapy needs in a timely manner.

Conclusion and implications: The framework embraces an initiative that enhances care delivery, reinforces and expands the role of pharmacists within paediatric oncology and extends to support ambulatory care to include paediatric patients who are cared for at their own home. This framework is a foundation work that can be extrapolated

Category: Research

ID - Country: 13933 - Singapore

EARTH: Environmentally Aware Responsible Treatment for Healthcare waste programme

Lita Chew[1], Jo Lene Leow[2], Edison Lee[3] and Gwen Ang[3]

[1]National Cancer Centre Sinagpore
[2]SingHealth
[3]National University of Singapore

Improper disposal of hazardous oncology drugs, particularly oral chemotherapy, poses acute environmental and public health risks due to their persistence and bioactivity. These agents can contaminate soil and water, disrupt ecosystems, and carry carcinogenic potential outside clinical settings. A previous study at the National Cancer Centre Singapore (NCCS) revealed that 86% of patients were unaware of recommended disposal practices. This highlights a critical gap between established guidelines and public behavior, necessitating targeted interventions to mitigate the environmental and health impacts of pharmaceutical waste.

This study, titled the EARTH (Environmentally Aware Responsible Treatment for Healthcare) programme, aims to address these challenges through a multi-pronged approach. The primary objectives are (1) to assess the baseline knowledge, attitudes, and practices (KAP) regarding medication waste management among healthcare professionals, patients, and the public in Singapore, (2) to identify the barriers and facilitators influencing sustainable disposal habits; and to develop and evaluate a community-focused program designed to empower participants and promote safer, more sustainable healthcare practices.

A mixed-methods design has been adopted, integrating quantitative and qualitative approaches for a comprehensive evaluation. Between August and December 2025, an anonymous survey is administered to 500 randomly sampled participants, including healthcare professionals, patients, and caregivers, at NCCS and SingHealth events to establish baseline knowledge, attitudes, and practices. The qualitative phase consists of semi-structured interviews with 20 patient advocates to gain in-depth insights into barriers, facilitators, and community perceptions of sustainable practices. Quantitative analysis employs descriptive statistics and regression models, while qualitative data are evaluated using thematic analysis.

This study is due for completion in December 2025. Preliminary data indicates persistent gaps in understanding of proper drug disposal and overwhelming support for improved infrastructure and education. The anticipated findings are expected to provide critical, evidence-based insights for designing targeted interventions. By correlating demographic data with KAP, we can tailor educational campaigns to specific high-risk groups. The identification of key barriers and facilitators will inform actionable recommendations for policymakers and healthcare institutions to improve waste management infrastructure and public outreach. The discussion will focus on the potential of a community-centric, empowerment-based model to foster long-term behavioral change, moving beyond simple awareness to active participation in sustainable healthcare.

The EARTH programme is poised to provide a robust framework and validated resources for mitigating the environmental and public health impacts of medication waste. By integrating scientific rigor with community empowerment, this project aims to cultivate a culture of responsible medication management, contributing to a safer and more sustainable healthcare ecosystem.

References

Leow JL, Looi L, Lee Y, Chew L. Towards zero waste in pharmacy: Challenges and opportunities in Singapore. Proceedings of Singapore Healthcare. 2022;31. doi:10.1177/20101058221146323

Category: Research

ID - Country: 13863 - Australia

Empowering Patients in Precision Dosing: Balancing Feasibility and Limitations of Self-Collected Microsampling

Mirjana Radovanovic[1], Sarah Glewis[2], May Darwish[3], Vivian Shen[3], Senthil Lengaratnam[3], Jeanne Tie[2], Raina Naik[3], Michael Michael[2], Jennifer Martin[1] and Marliese Alexander[2]
[1]University of Newcastle
[2]Peter MacCallum Cancer Centre | The University of Melbourne
[3]Peter MacCallum Cancer Centre

Introduction/Aims: Therapeutic drug monitoring (TDM) supports precision dosing but conventionally requires time-specific venous sampling at pathology collection centres. Finger-prick microsampling offers a patient-friendly at-home alternative. Using 5-fluorouracil (5-FU) as an exemplar, this study evaluated the feasibility and quality of staff- and patient-collected finger-prick microsamples within the PRECISION-ITS trial (ACTRN12624000079549), comparing Mitra® and Telimmune® UNO devices across metropolitan and regional sites.

Methods: Patients with metastatic, unresectable colorectal cancer receiving 5-FU at four Australian hospitals (1 metropolitan and 3 regional) underwent finger-prick sampling during TDM cycles, providing both patient- and staff-collected microsamples. Sample quality was visually assessed by a trained scientist. Mitra® samples were acceptable if ≥1 polymer tip was fully saturated without visible mesh or coagulation, while

Telimmune® samples required an even smear without excess residue. Training was provided to all sites and patients, with education later strengthened through in-house videos and practical demonstrations. Differences in sample viability rates by device, collector, site locality, and education mode, were assessed using two-tailed mid-P exact tests.

Results: Thirty-four patients provided 233 microsamples across 61 timepoints (117 Mitra®, 116 Telimmune®), with 68% (159/233) overall viable sample rate. By device: viability was higher for Mitra® than Telimmune® (76% versus 60%; p=0.01). By collector: staff-collected samples were more often viable than patient-collected (80% versus 55%; p<0.01). For Mitra®, staff versus patient viability was 83% versus 68% (p=0.06), while for Telimmune® it was 77% versus 42% (p<0.01). By site: metropolitan samples were more viable than regional (72% versus 60%; p=0.08). Among staff-collectors, viability was 84% metropolitan versus 72% regional (p=0.13); for patients, 59% versus 45% (p=0.19). Despite additional education and training, viability rates did not improve between early and later collections for staff-collected (86% versus 78%, p=0.42) nor patient-collected (64% vs 57%, p=0.65). Rejected samples were primarily due to underfilling, overfilling, or haemolysis.

Discussion: Finger-prick microsampling can reduce patient burden by eliminating the need for on-site venous blood collection; however, practical challenges remain that limit its routine clinical implementation. Mitra® devices and staff-collected samples were consistently more viable than Telimmune® and patient-collected samples. Device choice and staff familiarity appeared to influence success rates. Tailored and upscaled education did not improve sample viability, suggesting that successful self-collection relies on patient and staff confidence and technical ability. Additionally, metropolitan sites yielded more viable samples, likely due to a combination of better familiarity with higher recruitment and the hands-on and face-to-face training. While finger-prick microsampling may offer a less invasive and at-home testing alternative to conventional venous sampling; the viability of samples collected using finger-prick devices relies heavily on device usability and the collector's proficiency. Self-collection for TDM may therefore be best suited to selected cohorts, with traditional venous sampling remaining a pivotal option in broader clinical practice.

Conclusion: Microsampling shows promise for convenient home-based TDM but requires further evaluation before routine use to identify suitable patient cohorts, optimal devices, and education strategies that support high sample viability. Grant-ID: MRFFMMI P000011

Category: Research

ID - Country: 13950 - Australia

Estimating occurrence of immune-related adverse events induced by checkpoint inhibitors and time from exposure to toxicity in an Australian state-wide hospital population.

Bishma Jayathilaka[1], Fan He[2], Maarten IJzerman[3], George Au-Yeung[1] and Fanny Franchini[2]

[1]*Peter MacCallum Cancer Centre*
[2]*University of Melbourne*
[3]*Erasmus University*

Background: Immune-related adverse events (irAE) complicate use of immune checkpoint inhibitors (ICI). We aimed to estimate rates of gastrointestinal toxicity and compare time from first treatment to toxicity among patients in hospital admitted and emergency episodes across Victoria, Australia using linked administrative datasets.

Method: We analysed hospital episodes coded by International Statistical Classification of Diseases and Related Health Problems 10th Revision Australian Modification (ICD-10-AM) to infer irAE toxicity. We used the Transforming Outcomes through Research in Cancer Healthcare in VICtoria Cohort containing patients in the Victorian Cancer Registry diagnosed with specific cancers between 2010-2021, with data linked to Commonwealth datasets (including Pharmaceutical Benefits Scheme [PBS]). We developed definitions for irAE occurrence from ICD-10-AM codes. For the ICI cohort, we included patients who received at least one dose of ipilimumab, nivolumab, pembrolizumab, durvalumab, avelumab, atezolizumab, or cemiplimab. For the non-ICI cohort, we identified patients who received any other cancer medication. We applied ICD-10-AM-defined irAE to the Victorian Admitted Episodes Dataset (VAED) and Victorian Emergency Minimum Dataset (VEMD) to estimate toxicity rates and calculate time from first exposure to gastrointestinal toxicity.

Results: Among 222,332 patients, 8,003 were identified for ICI-exposed cohort and 98,168 for non-ICI-exposed cohort. Colitis/enterocolitis was the most common gastrointestinal irAE in VAED and VEMD at a combined rate of 22.28%. Time from exposure to gastrointestinal toxicity was lower among ICI-exposed compared to

non-ICI-exposed patients. Pooled cumulative distribution in VAED and VEMD showed that 25% of gastrointestinal events happened within 47 days among ICI-exposed patients and 118 days among non-ICI-exposed patients. Less common irAE types were inferred from VAED including cardiac. Inference rates for myocarditis and pericarditis were 0.84% and 0.70%, respectively. Pooled cumulative distribution in VAED and VEMD showed that 25% of cardiac events happened within 42 days among ICI-exposed patients and 309 days among non-ICI-exposed patients. Rare types of irAE were also identified including neurological. Ethics was approved by the University of Melbourne Ethics and Australian Institute of Health and Welfare, Melbourne Health Human Research Ethics Committees.

Conclusion: Our findings show that inferred gastrointestinal and cardiac toxicity occurred sooner after first dose of ICI treatment compared to first dose of non-ICI treatment. This suggests our method to infer irAE may be appropriate but requires validation in different datasets. Our research contributes to growing knowledge on real-world irAE prevalence and underscores the potential use of administrative data to establish irAE occurrence. Importantly, our findings drew out rare types of irAE by examining a population-level dataset of cancer patients which can be underestimated in smaller cohort studies. Identifying irAE occurrence is a crucial step towards evaluating factors associated with irAE risk.

Category: Research

ID - Country: 13815 - Canada

Estimating the Risk of Hazardous Drug Surface Contamination Levels using an Occupational Exposure Judgment Tool

Chun-Yip Hon[1], Stephanie Wu[2], Matthew Jeronimo[2], Jing Li[3] and Tina Chiang[4]
[1]*Toronto Metropolitan University*
[2]*University of British Columbia*
[3]*Vancouver Coastal Health*
[4]*Fraser Health Authority*

Introduction and Aims/Objectives: The risk of healthcare workers being exposed to hazardous drugs has been known since the 1970s. Exposure to hazardous drugs can occur by touching drug-contaminated surfaces and is known to lead to reproductive toxicities as well as cancer in healthcare workers. Collecting and analyzing wipe samples from work surfaces in hospitals, especially those located in the pharmacy and oncology units, is commonly performed to determine the risk of occupational exposure. However, previous surface contamination studies have reported a large proportion of non-detects and collecting large numbers of surface wipe samples is a costly venture. Not only can both challenges be overcome by using occupational exposure judgment tools, these tools can provide an estimate of the risk of overexposure relative to a threshold or acceptable value. The objective of this study was to evaluate the utility of using an exposure judgment tool, Expostats, to estimate the risk of overexposure to hazardous drugs based on current surface contamination levels.

Study Design/Methods: This was a cross-sectional study design whereby surface wipe samples were collected from the pharmacy and oncology departments of four acute care hospitals situated in the Greater Vancouver Regional District in British Columbia, Canada. Wipe samples were collected from high-touch surfaces such as the biological safety cabinet, countertop, door handle, and IV pump among others. Wipes were analyzed using a gold standard method by Jeronimo et al. (2015) and the contamination results were subsequently input into Expostats - an exposure judgement tool which utilizes Bayesian statistics to estimate the likelihood of exceeding an acceptable threshold value. For these 'threshold values', the hygienic guidance values for several different hazardous drugs proposed by Quartucci et al. (2023) were used. The exceedance fraction output generated by Expostats was used to estimate the risk of contamination above the corresponding hygienic guidance value.

Results/Outcomes: Overall, 255 wipe samples were collected and the vast majority (~90%) were not detectable. The geometric mean values were quite low but some maximum surface concentration outliers were found with the highest reported contamination level being 3,280 pg/cm2 for cyclophosphamide from an IV pump in an oncology unit. There was a great deal of variability in surface contamination levels. Relative to the hygienic guidance values, the percent exceedance fraction $\geq$ 5% for all drugs ranged from 0.0 to 95.4%.

Discussion of results/outcomes: Although there was a large proportion of non-detects, surface contamination was found for most hazardous drugs examined. In addition, based on the outputs of the exposure judgment tool, Expostats, surface contamination above the corresponding hygienic guidance (acceptable) value is likely.

Conclusion and implications: Despite the fact that the participating facilities have implemented numerous exposure control measures, hazardous drug contamination on surfaces is still possible. This is not a unique finding and suggests that it might not be possible to completely eliminate hazardous drug contamination from

work surfaces in the pharmacy and oncology units. Therefore, routine environmental monitoring is recommended and values should be input into Expostats (or similar) to assist with interpretation of the associated risk of overexposure.

References

Jeronimo M, Colombo M, Astrakianakis G, Hon CY. A surface wipe sampling and LC-MS/MS method for the simultaneous detection of six antineoplastic drugs commonly handled by healthcare workers. Anal Bioanal Chem. 2015;407(23):7083–92.

Quartucci C, Rooney JPK, Nowak D, Rakete S. Evaluation of long-term data on surface contamination by antineoplastic drugs in pharmacies. Int Arch Occup Environ Health. 2023 July;96(5):675–83.

Category: Research

ID - Country: 13846 - United Kingdom

Evaluation of 8-weekly prescribing and review of lenalidomide patients in NHS Lanarkshire.

Alice MacDonald[1], Kelly Baillie[1] and Jane Clark[1]
[1]*University Hospital Wishaw*

Background: Lenalidomide requires regular monitoring of full blood count (FBC) due to the potential to cause haematological toxicity. It is recommended that FBC is monitored 4-weekly. The pregnancy prevention programme for lenalidomide allows for up to 12weeks to be supplied for men, and women of non-child bearing potential. In some West of Scotland (WoS) boards, stable patients are prescribed 8-weeks of lenalidomide. Within NHS Lanarkshire, although some patients are prescribed 8 weeks supply at a time they receive this in 4-weekly instalments with the requirement for an interim 4-weekly blood check.

Objective: To identify causes of dose changes or delays in treatment once patients are stable and undergoing 8 weekly review with single agent lenalidomide or in combination with dexamethasone at University Hospital Wishaw (UHW) and the need for continued 4 weekly blood monitoring.

Methods: Retrospective study of UHW patients receiving lenalidomide treatment (either single agent or in combination with dexamethasone) between 30/06/24 and 31/12/24. Data was extracted from the Chemotherapy Electronic Prescribing and Administration System (CEPAS) and the from the patient's clinical record (Clinical portal). Clinical records were reviewed by a cancer care pharmacist to determine if there were treatment delays and/or dose changes due to blood results or toxicities. Safety outcomes were defined as the absence of cytopenias or toxicities necessitating dose modification, treatment interruption, or unscheduled clinical review.

Results: 39 patients were identified as receiving lenalidomide within the defined 6-month period; median age 71 years (50-89 years). 26 (66.7%) of the 39 patients were under 8-weekly consultant review with 4-weekly blood monitoring. 10 patients (38.5%) received maintenance lenalidomide and 16 (61.5%) received lenalidomide with dexamethasone. There was no incidence of neutropenia or thrombocytopenia below WoS protocol ranges on review of the interim FBC within the 6-month study period. All patients continued on the same dose of lenalidomide throughout the study period with the exception of one patient who had a dose reduction due to gastrointestinal upset and one patient had a dose increase as possible disease progression which had been determined at the 8 weekly review.

Conclusion: Review of 4-weekly blood results in patients established on lenalidomide showed minimal intervention or requirement for dose changes in stable patients. Results suggest stable lenalidomide patients can be extended to 8-weekly prescribing and supply, reducing the burden of frequent visits while maintaining clinical vigilance. These results have been used to review and update the current WoS lenalidomide protocols and blood monitoring guidance which has resulted in reduced laboratory and out-patient workload and has resulted in a more positive patient experience.

Category: Research

ID - Country: 12438 - United Kingdom

Evaluation of Prohibited Concomitant Medications and Washout Intervals in Clinical Trials at Sarah Cannon Research Institute

Sheliza Esmail[1], Hameeda Sultany[1], Anita Carlier[2], Tahereh Tajboor[2] and Elisa Fontana[2]
[1]*HCA - Sarah Cannon Research Institute*
[2]*Sarah Cannon Research Institute*

Evaluation of Prohibited Concomitant Medications and Washout Intervals in Clinical Trials at Sarah Cannon Research Institute

Introduction: Sarah Cannon Research Institute (SCRI), the clinical trial centre of HCA Healthcare UK, recruits primarily to oncology/haematology Phase I, first in-human studies. All clinical trials, in particular Phase 1 trials, have prohibited concomitant medications and washout periods to consider before enrolling a patient. If not promptly identified, treatment delays are inevitable

or patients could risk becoming ineligible for trial. Through identification of common classes of IMP and their associated washout periods and potential drug interactions, screening and trial initiation can be optimised.

Aims/Objectives:

1) Identify common prohibited concomitant medications and washout periods
2) Utilise multiple sources to compile a list of drug classes likely to be prohibited
3) Create educational material for wider clinical trial team and GPs

Method: Data from all new trials opened between 2023 and 2024 were evaluated to review the concomitant medications or class of medications that are prohibited or required a washout period. The length of the washout period was also evaluated. The results were tabulated according to IMP class. Non-interventional trials were excluded. Credible meds1 and Indiana University2 were some of the sources utilised.

Results: - Between 2023 and 2024, 31 studies were opened (19 Phase I studies, 4 Phase II studies, 8 Phase III studies).

–Of 31 studies; 5 Antibody-Drug Conjugate (ADC) studies, 6 Bispecific antibody T-Cell Engager (BiTE) studies, 3 Monoclonal Antibody (MAB) studies, 1 cellular therapy study and 16 small molecules studies.
–12 out of 19 phase I studies, 2 out of 4 phase II studies and 4 out of 8 phase III studies required discontinuing strong/moderate CYP inhibitors or inducers within 2 weeks prior to starting trial treatment.
–8 out of 31 studies prohibited p-glycoprotein inhibitors and required washout within 7 to 14 days prior to treatment. 6 studies involved small molecules targeted therapy and 2 were with ADCs.
–27 out of 31 studies required stopping systemic chemotherapy and/or radiotherapy within 2 to 4 weeks of starting treatment.
–100% BiTE studies required stopping corticosteroids >12mg daily prednisolone equivalent between 2 to 3 weeks prior.
–7 out of 31 studies required stopping drugs that prolong QTc interval. 5 of these were with small molecules, while the other 2 were with ADCs.
–2 small molecule studies mentioned caution with MATE2-K substrates. 4 studies prohibited PPIs, while herbal medicines and warfarin were also mentioned in some studies.

Discussion: P-Gp inhibitors and corticosteroids are usually prohibited or to be used with caution. CYP3A4/5 enzyme inducers/inhibitors that require a washout are often common medications such as Amlodipine where alternatives can be substituted. Washout periods reflect in treatment class requirements, with ADCs needing longer chemotherapy-free intervals, while BiTEs emphasize immunosuppressive agent clearance.

While this work is informative and suitable for educational programmes, the general rules identified will not exclude the necessity to cross check each patient's pharmacology history against the relevant protocol.

The educational material will be made available at BOPA Conference.

References

1. Woosley RL, Heise CW, Gallo T, Woosley RD, Lambson J. and Romero KA. QT drugs List [online]. AZCERT, 1457 E. Desert Garden Dr., Tucson, AZ 85718; 2013 [Accessed 16 May 2025]. Available from: https://www.crediblemeds.org.
2. Drug Interactions Flockhart Table, Indiana University [online]. The Trustees of Indiana University: Indiana; 2025 [Accessed 16 May 2025]. Available from: https://drug-interactions.medicine.iu.edu/MainTable.aspx.

Category: Research

ID - Country: 13977 - Morocco

Evaluation of Two Annona Species Consumption by Pediatric Cancer Patients

Yassine Eddahoumi[1], Hind Qajia[1], Oumaima Elqabissi[1], Soumaya Mousannif[1], Lamyae Yachi[1] and Mustapha Bouatia[1]
[1]Faculty of Medecine and Pharmacy of Rabat

Background: Pediatric cancer represents a major public health challenge globally, with families increasingly seeking complementary therapeutic approaches. The Annonaceae family, particularly Annona muricata (graviola) and Annona cherimola (cherimoya), has gained attention for potential anticancer properties.

Objective: To evaluate the prevalence, patterns, and perceived efficacy of Annona species consumption among pediatric cancer patients and their families.

Methods: A prospective ethnopharmacological survey was conducted over 4 months (February-May 2023) involving 148 pediatric cancer patients aged 0-18 years and their families. Data collection included structured interviews covering sociodemographic characteristics, usage patterns, perceived efficacy, and safety profiles.

Results: Thirty-four percent of families (50/148) reported using Annona species for their children with cancer. Annona muricata was used by 23% of families and A. cherimola by 18%. Main motivations included improving treatment efficacy (58%) and reducing side effects (38%). Among the 52% of users (26/50 families) who reported perceiving benefits, the most common improvements were: enhanced appetite (67% of those reporting benefits), reduced nausea (45% of those reporting benefits), and improved general condition (38% of those reporting benefits). Ninety-one percent of families had not disclosed this use to their medical team. Rural origin (OR=2.3; 95% CI: 1.4-3.8) and modest socioeconomic status (OR=1.9; 95% CI: 1.2-3.1) were associated with increased usage.

Conclusion: Annona species consumption is prevalent among pediatric cancer families, highlighting the need for improved healthcare provider-patient communication and evidence-based clinical research in this population.

References

Caparros-Lefebvre D, Elbaz A. Possible relation of atypical parkinsonism in the French West Indies with consumption of tropical plants: a case-control study. Caribbean Parkinsonism Study Group. Lancet. 1999;354(9175):281-6.

Lallas M, Desai N, Gorecki P, Degowin R, Bickers D. The use of complementary and alternative medicine among children with cancer. Crit Rev Oncol Hematol. 2000;35(1):25-30.

Boudra S, Nasri N, Taimasni A. Utilisation de la médecine alternative en oncologie pédiatrique au Maroc. J Afr Cancer. 2011;3(4):177-82.

Kretschmer N, Rinner B, Stuendl N, et al. Effect of costunolide and dehydrocostus lactone on cell cycle, apoptosis, and ABC transporter expression in human soft tissue sarcoma cells. Planta Med. 2012;78(16):1749-56.

Zick SM, Snyder D, Abrams DI. Pros and cons of dietary strategies popular among cancer patients. Oncology. 2018;32(11):542-7.

Category: Research

ID - Country: 13425 - United Kingdom

Exploring an enhanced role of the pharmacy technician in cancer services within the UK independent sector.

Jared Bannister[1], Philip Jones[2] and Netty Cracknell[3]

[1]*Spire Healthcare Group PLC*
[2]*Association of Pharmacy Technicians UK*
[3]*Lewisham and Greenwich NHS Trust*

Introduction: Cancer services within the independent sector often operate with limited oncology pharmacists on site. This causes operational issues when leave occurs and can also limit overall capacity. While locum cover is a potential option, this often causes service disruption and negative patient experience due to lack of local knowledge. The BOPA Vision statement for Oncology Pharmacy Practitioners highlights opportunities for pharmacy technicians to verify lower-complexity SACT prescriptions, however this model may not be fully applicable to the independent sector, where a broader role is required due to the nature of service delivery. In line with the Post-Registration Frameworks and Career Pathways: High-Level Research for Pharmacy Technicians report, formalized career pathways and a unified framework has been proposed which includes multiprofessional levels of practice for pharmacy technicians. These include: entry level, enhanced, advanced and consultant. In line with this framework and to tackle local issues of staff contingency in the independent sector; an enhanced pharmacy technician role was developed.

Methods: An appropriate site and pharmacy technician were chosen based on key selection criteria. The selected pharmacy technician was then trained and accredited to manage all aspects of the oncology pharmacy service with the proviso that clinical tasks would be managed by a remote supporting oncology pharmacist. Feedback on the service from pharmacy management, nursing colleagues, and from the pharmacy technician trained into the enhanced role was then collated and reviewed.

Results: The response to the pilot study was extremely positive, with pharmacy management reporting elimination of locum requirement, the pharmacy technician reporting significant improvement in job satisfaction, and nursing colleagues reporting significant improvement in workflow and patient experience when comparing the enhanced pharmacy technician role to prior experiences with locum cover. The new role also improved overall capacity and improved workflow efficiency during times when the incumbent oncology pharmacist was on site. This was due to the enhanced role pharmacy technician being able to support a greater breadth of the day-to-day service requirements.

Conclusion: This study confirms the feasibility of the enhanced pharmacy technician role in enabling remote cover for a specialist service. It also provides a valuable professional development pathway for pharmacy technicians and has wider implications outside of the original research setting. Internationally within oncology, the enhanced

pharmacy technician role might provide a mechanism for improved remote clinical support from an oncology pharmacist in areas where large distances might previously have been prohibitive. Similar models might also be applicable to other pharmacy specialties. Further research across multiple sites and specialties is warranted.

References

1. British Oncology Pharmacy Association (BOPA). BOPA Position Statement – Pharmacy Technician Clinical Verification of Systemic Anti-Cancer Therapy (SACT) and Supportive Medication Prescriptions. https://www.bopa.org.uk/resources/bopa-position-statement-pharmacy-technician-clinical-verification-of-systemic-anti-cancer-therapy-sact-and-supportive-medication-prescriptions-january-2023/ (2003, accessed 22nd October 2025)
2. British Oncology Pharmacy Association (BOPA). Governance, Advocacy and Publications Committee (GAP): BOPA Vision for Oncology Pharmacy Practitioners: Synopsis v 3.0. https://www.bopa.org.uk/wp-content/uploads/2023/01/BOPA-Vision-for-Oncology-Pharmacy-Practitioners-Synopsis-v-3.0.pdf (2021, accessed 22nd October 2025)
3. The Association of Pharmacy Technician UK (APTUK). Development of a UK recognized career pathway for post-registration pharmacy technician practice (phase 1). Post-Registration Frameworks and Career Pathways: High-Level Research for Pharmacy Technicians (2025, Accessed 22nd October 2025)

Category: Research

ID - Country: 13924 - Turkey

Frequency of Potential Drug–Drug Interactions in Pediatric Hematology/Oncology Clinic: A preliminary study

Seyda Kumbasar[1], Ömer Faruk Özkanlı[2], Irem Bayindir[2], Öykü Gürol[2], Ceren Sun[2], Cemre Ince[2], Sena Dibazar[2], Müzeyyen Aksoy[2] and Songül Tezcan[2]

[1]Marmara University, Institute of Health Sciences
[2]Marmara University, Faculty of Pharmacy

Background: Multi-drug regimens used in pediatric cancer treatment can lead to potential drug–drug interactions (pDDIs). These interactions may compromise treatment efficacy, increase the risk of adverse events, and significant challenges for clinical management.

Aim: This study aimed to evaluate the frequency of pDDIs among pediatric patients in a hematology/oncology unit.

Methods: This prospective and descriptive study was conducted in the Pediatric Hematology/Oncology Clinic-PHOC) at university hospital in Istanbul (Türkiye). Patients aged 0–18 years who were admitted to clinic between April 1, 2025, and October 1, 2025, were included. Patient medication orders were reviewed for those who stayed in the clinic for a minimum of 24 hours and had at least two drugs prescribed. pDDIs were assessed using the Medscape and Lexidrug databases.

Results: A total of 30 patients were enrolled in the study (19 boys and 11 girls). The median age was 8 years (interquartile range (IQR)= 4–15), and the median body mass index (BMI) was 17.5 (14.2–24.6). The most frequently observed malignancies were acute lymphoblastic leukemia (ALL, 33%), neuroblastoma (16.7%), and medulloblastoma (6.7%). The median duration since malignancy diagnosis was 3 months (1.5–11). The median number of drugs per patient was 6.5 (5–9), and the median number of chemotherapy drugs was 1 (0–2). The median Medication Regimen Complexity Index (MRCI) score was 41 (31.8–61.8). Across all patients, 111 pDDIs (3.7 per patient) were identified using Medscape and 135 pDDIs (4.4 per patient) using Lexidrug. According to Medscape, 2 interactions were classified as contraindicated, 20 as major, and 89 as requiring monitoring. Lexidrug classification revealed 7 level X, 24 level D, and 104 level C DDIs. The agents most frequently involved in interactions were tramadol (n=25), ondansetron (n=24), and potassium compounds (n=22). The most common pDDIs were ondansetron–tramadol (n=5), furosemide–potassium chloride (n=4), and ondansetron–escitalopram (n=4).

Conclusion: This preliminary study demonstrates that pDDIs are frequent in pediatric hematology/oncology patients receiving complex therapeutic regimens. Although most interactions required monitoring rather than contraindication, their clinical significance warrants attention. Further studies with larger patient populations are needed to validate these findings and to develop targeted strategies for optimizing medication safety.

Category: Research

ID - Country: 13988 - Colombia

Global Strategies to Reduce Oncology Drug Waste and Costs: A Bibliometric Analysis Enhanced by Biomedical Named Entity Recognition

Ivan Enrique Henao Torres[1], Antistio Aníbal Alviz Amador[2] and Nathalie Elizabeth Gómez Sánchez[3]

[1]Asisfarma

[2]University of Cartagena
[3]Universidad Nacional de Colombia

Introduction and Objectives: Pharmacovigilance in oncology extends beyond adverse reaction monitoring to encompass the safe and rational use of high-cost medicines. A persistent challenge is the wastage of oncology drugs, particularly parenteral formulations, which has clinical, economic, and safety implications. Up to 30% of these medicines may be discarded because vial sizes are not tailored to individualized dosing, increasing the risk of preparation errors, occupational exposure, and hazardous waste generation. This bibliometric study, integrated with a Natural Language Processing model, aimed to analyze global scientific production on strategies to optimize costs and reduce oncology drug waste, highlighting their potential clinical impact and contribution to strengthening pharmacovigilance policies.

Methods: A bibliometric analysis was performed and integrated with a Named Entity Recognition (NER) model.

Data retrieval: Abstracts of original research articles published between 2004 and 2024 were collected from the Dimensions AI database, focusing on cost-optimization and waste-reduction strategies in oncology.

Bibliometric analysis: Publication output, citations, countries, institutions, authors, journals, term co-occurrence, and thematic evolution were analyzed using VOSviewer, NetworkX, and Bibliometrix (R-package) [1].

NER model: The SciSpacy biomedical NER model was used to automate the extraction and normalization of oncology drug names from abstracts [2]. Ethical approval was not required, as only publicly available bibliographic data were analyzed.

Results: A total of 173 original articles from 30 countries (1.371 total citations) were analyzed, showing a consistent increase in publications since 2017. The United States led with 34,9% of papers, followed by France, the United Kingdom, Canada, and Belgium. The most frequently reported cost-optimization strategies were dose banding, dose rounding, vial sharing, and dose capping.

Leading contributors in the field included institutions such as the University of Toronto, Texas Oncology, and the Mayo Clinic; authors such as Jean-Daniel Hecq, Laura Soumoy, and Etienne Chatelut; and journals such as the Journal of Oncology Pharmacy Practice, Journal of Clinical Oncology, and Blood.

Term co-occurrence analysis identified emerging research hotspots related to pembrolizumab, nivolumab, waste reduction, and financial impact.

The NER model extracted 109 distinct oncology drug names, with trastuzumab, carboplatin, and pembrolizumab being the most frequently mentioned.

Discussion of Results: The integration of bibliometric methods with biomedical NER allowed a systematic mapping of global evidence on oncology drug waste reduction. This combination improved the precision of identifying therapeutic agents and research trends, offering a reproducible and data-driven approach to evaluating pharmacoeconomic practices in oncology pharmacy. The results highlight increasing awareness of sustainability and patient safety as essential dimensions of modern pharmacovigilance.

Conclusion and Implications: Strategies such as dose banding, dose rounding, vial sharing, and dose capping represent effective approaches to optimize costs, improve clinical outcomes, and minimize waste in oncology. Integrating bibliometric and Natural Language Processing tools can strengthen clinical decision-making and support evidence-based policies to enhance the sustainability of oncology pharmacotherapy and global pharmacovigilance systems. Future research should evaluate the clinical and economic impact of these strategies in local and institutional contexts.

References

1. [1] Yao R, Shen Z, Xu X, Ling G, Xiang R, Song T, et al. Knowledge mapping of graph neural networks for drug discovery: a bibliometric and visualized analysis. Front Pharmacol. 2024 May 10;15:1393415.
2. [2] Jolly A, Pandey V, Singh I, Sharma N. Exploring biomedical named entity recognition via SciSpaCy and BioBERT models. Open Biomed Eng J. 2024;18(1).

Category: Research

ID - Country: 13929 - United Kingdom

Immune-Related Adverse Events and Therapeutic Outcomes After Stopping Immune Checkpoint Inhibitors Due to Toxicity Among Patients with Metastatic Melanoma

Karmen Iessa[1] and Yousif Shamsaldeen[2]
[1]University of Brighton
[2]Liverpool John Moores University

Melanoma is an aggressive form of skin cancer. Immune checkpoint inhibitors (ICIs) are recommended for the treatment of metastatic melanoma. Despite enhancing the immune response to target cancer cells, ICIs can result in immune-related adverse events (irAEs) such as colitis and dermatitis. Recent studies have revealed an association between the incidence of irAEs and improved therapeutic outcomes. This study aimed to evaluate the relationship between patient survival and the discontinuation of ICI therapy due to immunological toxicity in metastatic melanoma patients. A retrospective study was conducted on patients diagnosed with metastatic melanoma and treated with ICIs at University Hospitals Sussex NHS Foundation Trust (UHSussex) between October 2011 and December 2022. The top five organs affected by irAEs included the gastrointestinal, hepatic, endocrine, skin, and musculoskeletal systems. Of the 344 patients, 142 were alive or continuing ICI therapy, revealing an overall survival (OS) rate of 41.3%. The incidence of irAEs was 68.3% among the 142 metastatic melanoma patients who were alive, showing a significant association ($p<0.001$, Pearson's $R=0.249$). Therapy discontinuation due to toxicity occurred in 83 patients (24.13%). Among these, 56 patients were alive at the cut-off point (67.5%), also showing a significant association ($p<0.001$, Pearson's $R=0.171$). In conclusion, the positive correlation between irAEs and survival may highlight the potential value of irAEs and irAE-related toxicity as biomarkers of therapeutic efficacy in the management of metastatic melanoma.

Category: Research

ID - Country: 13943 - Australia

Impact of reduced dexamethasone pre-medication in three weekly paclitaxel regimens

Whiter Tang[1], Karensa Houghton[1], Yuhao Wang[2] and Xue Bai[2]
[1]*Chris O'Brien Lifehouse*
[2]*University of Sydney*

Objective/Purpose: Paclitaxel, a commonly used chemotherapy agent, is associated with dose-limiting hypersensitivity reactions (HSRs), primarily due to its vehicle, Cremophor EL. These reactions typically occur within minutes of infusion initiation and are mediated through complement activation, histamine release, and IgE/IgG mechanisms. Dexamethasone, a corticosteroid, is routinely administered as a pre-medication to mitigate HSRs. However, its use is linked to various adverse effects, including insomnia, hyperglycaemia, and hyperactivity.

At our comprehensive cancer centre in Australia, a preliminary analysis suggested that a reduced oral dexamethasone regimen—8mg the night before and 8mg one hour before paclitaxel, combined with 10mg loratadine—could be as effective as the standard 20mg regimen. (1) This change was implemented across all treatment plans in November 2022. The primary objective of this study was to compare the HSR rates between these two dexamethasone dose pre-medication regimens.

Study Design / Methods: This retrospective, single-centre, observational study aimed to assess the non-inferiority of a reduced dexamethasone regimen. We compared the incidence of paclitaxel-induced HSRs in two cohorts: patients receiving 20mg dexamethasone night before and morning of paclitaxel (October 2019 to October 2022) and those receiving 8mg dexamethasone night before and morning of paclitaxel (November 2022 to July 2025). Data was extracted from electronic medical records for documented HSR and dispensing records were used for the total number of 3 weekly paclitaxel patients. We recorded patient age, cycle number, paclitaxel dose, and HSR severity and Chi-square tests were employed to evaluate differences in HSR rates between the two groups.

Results / Key Findings: A total of 549 patients were analysed, with 298 in the 20mg dexamethasone group and 251 in the 8mg group. The HSR rate was 35.2% in the 20mg cohort and 22.7% in the 8mg cohort, indicating a significant reduction in HSRs with the lower dexamethasone dose ($p = 0.0018$; $OR = 0.54$). The distribution of HSR severity remained similar between the two cohorts ($p = 0.96$) and the cycle number at which HSRs occurred was comparable ($p = 0.82$). This study suggests that a reduction in dexamethasone pre-medication does not increase the rate of hypersensitivity nor increase the severity of HSR or at which cycle number it occurs.

Conclusions / Recommendations: Our study demonstrates that a pre-medication regimen of 8mg dexamethasone the night before and 8mg dexamethasone plus 10mg loratadine one hour before paclitaxel is non-inferior to the standard 20mg regimen in preventing HSRs to 3 weekly paclitaxel. This reduced corticosteroid approach offers patients fewer adverse effects and may enhance treatment completion rates. The study's retrospective nature is a limitation, and future research could explore tapering steroid pre-medication strategies similar to those used in weekly paclitaxel regimens.

References

1. 3264-Premedication for prophylaxis of taxane hypersensitivity reactions | eviQ [Internet]. Eviq.org.au. 2017. Available from: https://www.eviq.org.au/clinical-resources/side-effect-and-toxicity-management/immunological/3264-premedication-for-prophylaxis-of-taxane-hyper

Category: Research

ID - Country: 14198 - Australia

Incidence of Febrile Neutropenia and Time to Count Recovery in AML patients receiving pegylated G-CSF following HiDAC Consolidation

Madeleine Washbourne[1], Michael Whordley[1], Emily Fitzgerald[1], Elizabeth Luo[1], Jason Ung[2] and Lynn Peng[2]

[1]*Princess Alexandra Hospital*

[2]*Queensland University of Technology*

Chemotherapy-induced neutropenia is a major risk factor for infection in patients with acute myeloid leukaemia (AML) receiving high-dose cytarabine (HiDAC) consolidation. Pegylated granulocyte colony-stimulating factor (G-CSF) is widely used to shorten the neutropenic phase, but comparative evidence between these agents in the AML setting remains limited. The aim of this study was to review the incidence of febrile neutropaenia (FN) and time to count recovery (TTCR) in AML patients receiving pegfilgrastim or lipegfilgrastim following HiDAC consolidation.

A retrospective cohort analysis was conducted between 2018 – 2025 at a single tertiary hospital on AML patients who were administered pegfilgrastim or lipegfilgrastim following HiDAC consolidation. Incidence of FN was defined as absolute neutrophil count (ANC) below <0.5x109/L in the presence of a fever of >38.5°C or >38.0°C over a 2-hour period. TTCR was determined as ANC reaching >0.5x109/L and >1.0x109/L in the days following the start of each HiDAC consolidation cycle. Further subgroup analysis included AML European Leukaemia NET (ELN) risk group classification, HiDAC protocols (1,2,3 vs 1,3,5) and individual HiDAC cycle comparisons. Data was extracted from electronic medical records and remained on site secured by password protection. Statistical analyses was performed in R with R version 4.4.1 (2024-06-14) (Team 2019) and using the tidyverse and FunnelPlotR packages.

A total of 87 patients were identified with 39 patients in the pegfilgrastim cohort and 48 patients in the lipegfilgrastim cohort. There were 87 cycles of HiDAC from patients who received pegfilgrastim and 127 cycles from lipegfilgrastim. No significant association of FN incidence was found between the two groups. The average TTCR of all cycles for ANC >0.5x109/L was 15.86 and 19.35 days for pegfilgrastim and lipegfilgrastim respectively (p-value <0.001). TTCR for ANC >1.0x109/L was 17.46 and 22.29 days for pegfilgrastim and lipegfilgrastim respectively (p-value < 0.001). The use of pegfilgrastim and lipegfilgrastim in HiDAC (1,2,3) protocol demonstrated improved TTCR for ANC >0.5x109/L and 1.0x109/L compared to HiDAC (1,3,5) protocol by 4.27 days and 5.03 days respectively (p-value <0.001). AML risk stratification identified favorable and intermediate risk cohorts to all count recover quicker with pegfilgrastim to ANC >0.5x109/L and 1.0x109/L compared to lipegfilgrastim Pegfilgrastim showed quicker TTCR for ANC > 0.5x109/L and 1.0x109/L in each individual HiDAC cycles 1, 2 and 3 compared to lipegfilgrastim (p-value < 0.001).

This study showed a significant reduction in the TTCR of 3 to 5 days for patients receiving pegfilgrastim compared to lipegfilgrastim following HiDAC consolidation. These results were consistent in the subgroup analysis of repeat cycles and risk group classification. The incidence of FN was not impacted by the pegylated agent G-CSF used. Pharmacokinetic differences between each pegylated G-CSF agents appear to influence recovery dynamics without materially affecting infection risk. These findings support the consideration of pegfilgrastim as a preferred agent for optimising haematologic recovery timelines in the AML patients.

In conclusion, lipegfilgrastim had prolonged TTCR compared with pegfilgrastim in AML patients receiving HiDAC consolidation. These results however did not translate into a reduced incidence of FN. Larger prospective studies are warranted to clarify the clinical implications.

Category: Research

ID - Country: 13906 - China

Incidence Of Treatment-Related Adverse Drug Reactions Related To Trastuzumab And Its Antibody-Drug Conjugates: A Systematic Review And Meta-Analysis From Randomized Controlled Trials

Kafauit, Farah[1]

[1]*Nanjing Medical University*

Background and aims: Trastuzumab and the antibody-drug conjugates (ADCs) that contain it, such as Trastuzumab emtansine (T-DM1) and Trastuzumab deruxtecan (T-DXd), have shown significant efficacy in treating HER2-positive cancers. Nevertheless, treatment-related adverse reactions (ADRs) are an essential concern and

must be identified and understood for their prevention and better management in cancer patients.

Methods: Utilizing the PICO framework, we performed a literature search systematically using Scopus, WOS (Web of Science), PubMed, and Embase from the inception/start dates to December 31, 2024, identifying 6,483 articles. We included published prospective randomized controlled trials (RCTs) that reported adverse events (AEs) associated with these drugs. The random effects model was employed to analyze data, determine the incidence of AEs, and investigate variations based on drug type, dose, and cancer type.

Results and discussion: 22 studies were selected for meta-analysis. Our findings revealed an overall pooled incidence of all-grade AEs at 97.0% (95% Confidence interval CI, 95.0%–98.2%). Incidence of Grade 3 and higher AEs (high-grade AEs), serious AEs, AEs that result in drug discontinuation, and AEs leading to death was noted at 45.7%, 19.0%, 13.5%, and 1.2%, respectively. Common all-grade AEs included nausea (46.8%), fatigue (36.7%), and vomiting (26.3%). The analysis revealed neutropenia (8.4%), thrombocytopenia (7.8%), and anemia (6.4%) as prevalent high-grade adverse drug reactions. Subgroup analyses indicated differences in grade-3 AEs across different types of HER2-positive malignancies, drugs, and dosage regimens.

Conclusion and implications: Overall, while T-DXd and T-DM1 exhibit superior efficacy compared to trastuzumab in treating HER2-positive cancers, they are associated with an increased incidence of adverse events, underscoring the critical need to consider safety profiles when making treatment decisions. These results provide clinicians and researchers with a comprehensive reference to better understand the safety profiles of these therapies, support informed decision-making, and improve management of treatment-related toxicities.

Keywords: Trastuzumab; antibody-drug conjugates; trastuzumab deruxtecan; trastuzumab emtansine; adverse drug reaction; systematic review; meta-analysis

Category: Research

ID - Country: 13828 - China

Mapping access to anticancer medicines in South Asia: NEMLs, regulatory approval, and local production in the policy context—a scoping review

Rimsha Khizar[1], Sundus Shukar[1], Farah Kafauit[2], Caijun Yang[1] and Yu Fang[1]

[1] *Xi'an Jiaotong University*
[2] *Qatar University*

Background: South Asia faces a growing cancer burden; however, healthcare systems across the region continue to experience difficulties in providing equitable access to affordable anticancer drugs. One potential solution to address this issue is to integrate anticancer medicines into National Essential Medicines Lists (NEMLs), expedite regulatory registration processes, and strengthen local pharmaceutical manufacturing capacities. These strategies are vital to improving access to life-saving treatments for cancer patients in the region. The objective of this scoping review was to assess the current status of anticancer medicines in South Asian countries, focusing on their inclusion in NEMLs, regulatory registration, and local manufacturing capacity, while identifying gaps and potential strategies to improve access.

Method: We conducted a scoping review encompassing both published and gray literature to assess the inclusion of anticancer medicines in National Essential Medicines Lists (NEMLs), their regulatory registration status, and local manufacturing across eight South Asian countries (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka). Relevant documents published between January 2000 and May 2025 were identified through database searches (PubMed, Scopus, Web of Science, Google Scholar) and manual searches of national regulatory authority websites and official reports.

Results: The review included a total of forty-five documents, comprising peer-reviewed studies, policy reports, and regulatory data. The evidence was unevenly distributed across the region, with Pakistan and India contributing the majority of data, while other countries had limited information available. A significant variation was observed in the alignment of national NEMLs with the WHO Model List of Essential Medicines for cancer. Pakistan's 2019 NEML was the most comprehensive, including all 66 WHO-recommended anticancer medicines. In contrast, other countries listed only a subset of these medicines, or, in some cases, none at all. Around 73% of the medicines included in the NEMLs were registered nationally, but their availability in healthcare facilities varied greatly, revealing a substantial implementation gap, even in Pakistan. Regulatory barriers were widespread across the region: in Pakistan, ad hoc import No-Objection Certificates (NOCs) often delayed access to unregistered medicines, while in India, anticancer drugs typically required a median of two to four years for approval. The security of supply remained fragile in many countries, with several nations failing to meet the WHO benchmark of at least three suppliers for each essential medicine. Notably, local production of anticancer

drugs was robust in Bangladesh and India, where thriving biosimilar and generic industries had led to 20–30% price reductions for several drugs. However, other South Asian countries continued to rely heavily on imports due to limited local production capacity.

Conclusion: South Asian countries continue to face significant challenges in ensuring timely access to anticancer medicines. Although policy initiatives such as NEML inclusion demonstrate commitment, these measures have not fully translated into improved patient access due to systemic barriers—particularly in regulatory processes and limited local manufacturing capacity. To enhance cancer care outcomes, it is essential to strengthen national regulatory authorities, streamline drug approval procedures, and promote the local production of quality-assured anticancer medicines. These efforts can be further reinforced through regional collaboration.

Category: Research

ID - Country: 13978 - Morocco

Nano-Radiopharmaceuticals in Cancer Treatment: A Systematic Review of Clinical Applications and Implications for Oncology Pharmacy Practice

Yassine Eddahoumi[1], Hind Qajia[1], Oumaima Elqabissi[1], Lamyae Yachi[1], Soumaya Mousannif[1] and Mustapha Bouatia[1]
[1]Faculty of Medecine and Pharmacy of Rabat

Background: The convergence of nanotechnology and radiopharmaceutical science represents a transformative approach in precision oncology. By combining nanoscale delivery systems with therapeutic radioisotopes, nano radiopharmaceuticals achieve targeted tumor irradiation while minimizing off target toxicity. Despite growing clinical adoption, systematic assessments integrating clinical efficacy, safety, and pharmacy practice implications remain limited.

Objective: To systematically review the clinical applications, therapeutic efficacy, safety outcomes, and pharmacy practice considerations of nano radiopharmaceuticals currently approved or in development for cancer treatment.

Methods: A systematic search was conducted in PubMed, EMBASE, Cochrane Library, Web of Science, and ClinicalTrials.gov from January 2015 to August 2025, following PRISMA guidelines. Human clinical trials reporting therapeutic applications of nano radiopharmaceuticals were included. Two reviewers independently screened and extracted data on study characteristics, efficacy outcomes, safety profiles, manufacturing requirements, and pharmacy practice implications.

Results: Of 3,247 records screened, 89 studies involving 12,456 patients were included. Agents approved for clinical use include ibritumomab tiuxetan (Zevalin®), lutetium 177 dotatate (Lutathera®), lutetium 177 PSMA 617 (Pluvicto®), and yttrium 90 microspheres. Overall response rates ranged from 23% to 83%, with hematologic malignancies showing superior activity (median ORR 78%) compared with solid tumors (median ORR 42%). Grade 3–4 toxicities occurred in 15–45% of patients, mainly hematologic. Implementation required specialized facilities in nearly 90% of institutions, with average preparation times of 2.5–4.8 hours and costs per treatment course ranging from $15,000 to $85,000.

Conclusion: Nano radiopharmaceuticals have demonstrated substantial clinical efficacy with manageable toxicity profiles across multiple cancer types. Their integration into oncology

References

1. Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2021;71(3):209-249. doi:10.3322/caac.21660
2. DeVita VT Jr, Chu E. A history of cancer chemotherapy. Cancer Res. 2008;68(21):8643-8653. doi:10.1158/0008-5472.CAN-07-6611
3. Kelkar SS, Reineke TM. Theranostics: combining imaging and therapy. Bioconjug Chem. 2011;22(10):1879-1903. doi:10.1021/bc200151q
4. Pouget JP, Lozza C, Deshayes E, et al. Introduction to radiobiology of targeted radionuclide therapy. Front Med (Lausanne). 2015;2:12. doi:10.3389/fmed.2015.00012
5. Sgouros G, Bodei L, McDevitt MR, et al. Radiopharmaceutical therapy in cancer: clinical advances and challenges. Nat Rev Drug Discov. 2020;19(9):589-608. doi:10.1038/s41573-020-0073-9

Category: Research

ID - Country: 13869 - United Kingdom

National Survey of the JBDS-IP/UK SACT board guidelines on the management of glycaemia

Dola Awoyemi[1], Pinkie Chambers[1], Daniel Morganstein[1] and Elaine Tomlins[1]
[1]UCL

Introduction: Systemic anti-cancer therapy (SACT) is reported to be associated with hyperglycaemia, in those people with or at risk of diabetes. Causes for the association can be a resultant effect of corticosteroids used both as part of treatment or in antiemetic protocols. Additionally, some SACT may cause hyperglycaemia.

Diabetes mellitus is common among patients diagnosed with cancer, affecting around 20% of individuals. In addition, in cancer patients diabetes is associated with more frequent emergency department attendance and hospital admission.

The Joint British Diabetes Societies (JBDS) and UK SACT board guideline on the management of glycaemic control in people with cancer, recommends monitoring of blood glucose and prompt management of glycaemia. This requires specialist diabetes input and clear lines of communication between the oncology and diabetes teams. However, since the publication of these guidelines their implementation has not been evaluated, and it is not known whether oncologists have the capacity to undertake this work.

We sought to understand the implementation of these guidelines. Our key objectives were to identify the proportion of hospitals that have adapted the guideline and the determinants to implementation (i.e. enablers and barriers) at organisational level.

Method: A survey containing 14 questions was developed to explore participant's awareness of the national guidelines, the implementation model adopted (full/partial), implementation challenges and measures to overcome these. The average content validity index for the instrument was assessed by an expert panel of 4 clinicians and a snowball-sampling technique was used to target healthcare professional across the country. The survey was administered to clinicians working at an institution delivering systematic anticancer therapy to adult cancer patients in the online platform Qualtrics between 18th November 2024 and 6th January 2025.

Results: Responses were received from 174 clinicians from 67 institutions, covering 27 % of hospitals providing cancer services in the UK. 45 % of clinicians (46 institutions) were aware of the JBDS/UK SACT board guidelines, with 18% (n=32, 30 hospitals) finding their implementation very important. However, only 31 out of 67 hospitals surveyed had implemented national guidance; 13 fully and 18 partially. In institutions with partial adoption, monitoring was restricted to cancer patients with the highest risk of hyperglycaemia; symptoms of hyperglycaemia without known diabetes (43% , n=9 respondents) or with pre-existing diabetes (9%, n=2 respondents). Organisational barriers included gaps in diabetes training, inability to supply testing equipment, staff shortages, and poor governance. External factors were difficulty agreeing a pathway with community providers of diabetes care and an evidence gap for embedding diabetes clinics in cancer centres. Implementation costs (such as monitoring, extra attendance and recruitment) were identified as organisational and external barriers. Implementation strategies to overcome these challenges included staff training on diabetes, establishing a pathway with primary care & improved governance.

Conclusion: Most institutions have not implemented national guidance although some have adopted measures to target those most at risk of hyperglycaemia . However, as the UK population ages the prevalence of multimorbidity, especially diabetes and cancer will increase, and we advocate for a national implementation strategy.

References

1. Joharatnam-Hogan N, Chambers P, Dhatariya K, Board R, Joint British Diabetes Society for Inpatient Care UKCB. A guideline for the outpatient management of glycaemic control in people with cancer. Diabet Med. 2022;39(1):e14636.
2. Kurteva S, Tamblyn R, Meguerditchian AN. Predictors of frequent emergency department visits among hospitalized cancer patients: a comparative cohort study using integrated clinical and administrative data to improve care delivery. BMC Health Serv Res. 2023;23(1):887.
3. Phillips AL, Reeves DJ, Storey S. Impact of diabetes (type 2) and glycemic control on health-related outcomes of patients receiving chemotherapy for non-metastatic breast cancer: a retrospective analysis. Support Care Cancer. 2023;31(2):114.
4. Kiburg KV, Ward GM, Vogrin S, Steele K, Mulrooney E, Loh M, et al. Impact of type 2 diabetes on hospitalization and mortality in people with malignancy. Diabet Med. 2020;37(2):362-8.
5. Polit DF, Beck CT, Owen S V. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. Res Nurs Health. 2007;30(4):459–67.

Category: Research

ID - Country: 13932 - Australia

Phenoconversion of CYP3A4, CYP2C19 and CYP2D6 in paediatrics, adolescents and young adults with lymphoma: the PEGASUS study

Sophie Wang[1], Andreas Halman[2], Tayla Stenta[2], Andrew Somogyi[3], Carl Kirkpatrick[4], Claire Moore[2], Dhrita Khatri[2], Elizabeth Williams[2], Roxanne Dyas[2], Sarah Glewis[5], May Darwish[6],

Raina Naik[6], Vivian Shen[7], Tim Spelman[6], David Elliott[2], Amanda Gwee[8], Rachel Conyers[9] and Marliese Alexander[10]

[1]*The University of Melbourne*
[2]*Murdoch Children's Research Institute*
[3]*University of Adelaide*
[4]*Monash University*
[5]*Department of Pharmacy, Peter MacCallum Cancer Centre | Sir Peter MacCallum Department of Oncology, University of Melbourne*
[6]*Peter MacCallum Cancer Centre*
[7]*Department of Pharmacy, Peter MacCallum Cancer Centre.*
[8]*The University of Melbourne | The Royal Children's Hospital | Murdoch Children's Research Institute*
[9]*Murdoch Children's Research Institute | The University of Melbourne | The Royal Children's Hospital*
[10]*Department of Pharmacy, Peter MacCallum Cancer Centre | Sir Peter MacCallum Department of Oncology, University of Melbourne*

Objective: Phenoconversion describes the change in a person's drug metabolism phenotype from gene-predicted phenotype, caused by non-genetic factors such as drug-drug interaction, disease burden or lifestyles. While the phenomenon is documented, it remains underexplored in paediatric, adolescent, and young adult (AYA) oncology - a population highly vulnerable to treatment-related toxicities (including infection, inflammation and polypharmacy). Recognising phenoconversion in this group could help optimise precision medicine and improve treatment outcome. The PEGASUS study aims to assess the feasibility and acceptability of phenoconversion measuring of CYP3A4, CYP2C19 and CYP2D6 enzyme activities in clinical settings using sub-therapeutic probe medications. This early report outlines accrual and retention outcomes, summarising the initial implementation experience and feasibility findings from the first six participants invited to participate, with the goal of informing process improvements and facilitating continued accrual to this important feasibility study.

Methods: This prospective, single-arm, single-blind, non-randomized feasibility study will enrol 20 patients aged 6-25 years with newly diagnosed Hodgkin or non-Hodgkin lymphoma, recruited from one paediatric and one adult quaternary referral hospitals in Melbourne Australia (NCT06383338). At enrolment, participants undergo genotyping for CYP3A4, CYP2C19, and CYP2D6 enzymes. To assess potential phenoconversion, longitudinal phenotyping is conducted at up to six timepoints during chemotherapy using two oral, sub-therapeutic probe drugs: omeprazole and dextromethorphan. These probe agents enable functional assessment of targeted CYP enzyme activity, measured via metabolic ratios (MRs) derived from blood samples. Samples are analysed using LC-MS/MS, and MRs are interpreted against validated thresholds to classify enzyme activity. Study acceptability is evaluated through structured surveys administered to patients and parents/guardians, incorporating both quantitative and qualitative methods.

Results: Consecutive patients were screened for eligibility from 11 June 2025. Of the first 6 eligible patients, 3 adolescents have consented to participation from the adult enrolling site and completed baseline genotyping and 2 phenotyping timepoints. The enrolled AYA patients were aged 23, 22, and 24 years, diagnosed respectively with Hodgkin's lymphoma, nodular lymphocyte predominant Hodgkin lymphoma, and mediastinal large B-cell lymphoma, and commenced treatment with N-AVD, R-CHOP21, and R-EPOCH, respectively. The paediatric patients who declined participation were aged 7, 16, and 17 years, all diagnosed with Hodgkin lymphoma, and were commencing treatment with the R-CYM or DECOPDAC regimens. Probe drugs were well tolerated, with no adverse events observed. Recruitment of paediatrics seems challenging, as 3 guardians declined consent citing logistical barriers and concerns about additional non-essential medications, whereas AYA participants demonstrated greater scheduling flexibility and acceptability to medications.

Conclusion: Phenoconversion measurement using probe drugs appears safe and acceptable in the AYA oncology population at the current stage. However, recruitment barriers in paediatrics might underscore the need for burden-minimising workflow. Findings from this study may equip healthcare professionals with clinical evidence and tools to more effectively personalise medication use. Future efforts will focus on refining workflow integration, enhancing consent processes, and expanding the study population.

Category: Research

ID - Country: 13997 - United States of America

Prophylactic Ravulizumab Enabling Continued Gemcitabine-Based Chemotherapy After Gemcitabine-Induced Thrombotic Microangiopathy in Metastatic Pancreatic Cancer

Justin Arnall[1] and Sarah Hanson[1]

[1]*Atrium Health*

Introduction and Aims/Objectives: Thrombotic microangiopathy (TMA) is a rare but serious complication

associated with gemcitabine therapy, particularly in patients receiving prolonged treatment. TMA can lead to significant morbidity and often necessitates discontinuation of effective chemotherapy. Complement activation has been implicated in the pathogenesis of drug-induced TMA, and complement inhibition has emerged as a potential therapeutic strategy. This case report describes the successful use of ravulizumab, a long-acting C5 complement inhibitor, for both treatment and prophylaxis of gemcitabine-induced TMA in a patient with metastatic pancreatic cancer, enabling continued chemotherapy.

Study Design/Methods: We retrospectively reviewed the clinical course of a patient with metastatic pancreatic adenocarcinoma who developed gemcitabine-induced TMA after progression on prior chemotherapy regimens. Clinical data were extracted from the electronic medical record, including chemotherapy administration dates, laboratory parameters, imaging, and symptom documentation. The patient's response to ravulizumab and subsequent chemotherapy tolerance were evaluated.

Results/Outcomes: A male patient with metastatic pancreatic cancer previously treated with FOLFIRINOX and liposomal irinotecan/5-FU was initiated on gemcitabine/nab-paclitaxel in April 2024. Shortly after reintroduction of gemcitabine, he developed clinical and laboratory features consistent with TMA, including thrombocytopenia, anemia, elevated LDH, and renal dysfunction. Gemcitabine was held, and TMA was managed with ravulizumab, initiated on May 7, 2024 (Cycle 1 Day 1), followed by subsequent doses on May 21 and July 30. After resolution of TMA, gemcitabine/nab-paclitaxel was resumed on May 14 given the prior response and relative tolerability, with ravulizumab administered at standard dosing but now as prophylaxis. The patient tolerated chemotherapy without recurrence of TMA over four additional cycles, spanning approximately four months. He ultimately transitioned to hospice care in late August due to disease progression, but notably did not experience further TMA episodes during continued gemcitabine exposure.

Discussion of Results/Outcomes: Gemcitabine-induced TMA is a rare but potentially life-threatening adverse event that often limits further chemotherapy. The successful use of ravulizumab in this case supports the hypothesis that complement activation plays a central role in the pathogenesis of gemcitabine-induced TMA. While eculizumab has been used in similar contexts, ravulizumab offers a longer dosing interval and may be more feasible for prophylactic use. This case demonstrates that complement inhibition can not only treat TMA but may also enable safe rechallenge with gemcitabine, preserving access to a critical therapeutic option in advanced pancreatic cancer.

Category: Research

ID - Country: 14016 - Australia

Rasburicase use in haematological malignancy in patients at high risk of Tumour Lysis Syndrome

Taylor Mackie[1], Marissa Ryan[2], Jane Dunsdon[2], Karl Winckel[2], Elizabeth Luo[2], Michael Whordley[2], Vivien Chan[2] and Joshua Tobin[2]

[1]*Taylor Mackie*

[2]*Princess Alexandra Hospital*

Introduction: Rasburicase is a high-cost medicine indicated for the prevention and treatment of tumour lysis syndrome (TLS). Local governance frameworks, such as Blanket Approval Listings (BAL), aim to optimise safe, effective, and economical use through patient risk stratification and fixed dosing strategies. While growing evidence supports low fixed-dose regimens, there is limited reported data on adherence to governance criteria and clinical outcomes. The primary aim of this study was to assess rasburicase use compliance with institutional BAL criteria in adult patients with haematological malignancies at a quaternary hospital in Australia. Secondary aims included the biochemical effectiveness of rasburicase 3 mg and 6 mg fixed-dose regimens defined as normalisation of serum urate ($\leq$0.476 mmol/L) within 24 hours of rasburicase administration. This outcome was assessed in both the TLS treatment group as well as high- and intermediate-risk TLS prophylaxis cohorts. Incidences of Laboratory TLS (LTLS) and Clinical TLS (CTLS) were also determined for the TLS prophylaxis cohort.

Methods: A retrospective, single-centre, observational audit was conducted of all adults with haematological malignancies who received at least one dose of rasburicase between March 2017 and March 2025. Patients treated within clinical trials or for non-haematological malignancies were excluded. Data was obtained from electronic medical records and pharmacy databases. BAL compliance, dosing patterns, and LTLS and CTLS outcomes within 7 days of rasburicase administration were recorded and analysed.

Results: Of 161 patients who received rasburicase, 144 were eligible for analysis. Most were high-risk for TLS 114/144 (79%) and 99/144 (69%) received rasburicase prophylactically. BAL compliance was 85%, with non-compliance primarily attributed to early biochemical

changes or urgent systemic anti-cancer therapy. Fixed low-dose regimens predominated, with 61% receiving a single dose of rasburicase. Urate normalisation within 24 hours was achieved in 92% of all patients and 97% of prophylaxis patients. Despite rapid biochemical response, 47/99 (47%) of prophylaxis patients demonstrated evidence of LTLS and 14/99 (14%) developed CTLS, where 9/14 (64%) had pre-existing kidney impairment.

Discussion: This study demonstrated high compliance with institutional prescribing criteria and confirmed that low fixed-dose rasburicase (3–6 mg) provides effective urate reduction in patients at high- and intermediate-risk for TLS. Biochemical responses were consistent across TLS risk levels, supporting simplified dosing strategies. The persistence of TLS despite urate normalisation underscores the multifactorial nature of TLS. This suggests urate reduction alone may be insufficient to prevent clinical progression, particularly in patients with pre-existing kidney impairment or aggressive and/or bulky disease. Deviations from BAL criteria often reflected appropriate clinical judgement, highlighting the need for flexible yet evidence informed governance policies.

Conclusion and Implications: Rasburicase use at our institution was largely compliant with governance criteria and achieved rapid, sustained urate normalisation in majority of patients using fixed low doses. These findings support the clinical and economic validity of low-dose rasburicase protocols for TLS prophylaxis in high- and intermediate-risk patients and TLS treatment. Further research is warranted to identify predictors of TLS progression which necessitate dose escalation, redosing, and the optimal interval between these additional doses.

Category: Research

ID - Country: 13909 - Qatar

Real-World Efficacy and Safety of Cabozantinib in Advanced Malignancies: A National Experience from Qatar

Hebatalla Afifi[1], Shereen Elazzazy[1], Arwa Sahal[1], Aya Alasmar[1], Farah Jibril[1], Sahar Nasser[1], Mohamed Sir Elkhatim[1], Aladdin Kanbour[1] and Dr. Anas Hamad[2]

[1]National Center for Cancer Care and Research, Hamad Medical Corporation, Doha, Qatar

[2]Hamad medical corporation - National Center for Cancer Care and Research - Doha, Qatar.

Correction (April 2026): Authorship order has been updated for the first and second authors.

Background: Cabozantinib is a small-molecule multi-tyrosine kinase inhibitor (TKI) that targets several signaling pathways involved in tumor growth, angiogenesis, metastasis, and immune modulation, including MET, VEGFR, AXL, and RET. Demonstrating efficacy in multiple solid tumors, cabozantinib is approved by the U.S. FDA and EMA for adults with advanced or metastatic renal cell carcinoma (mRCC), medullary thyroid cancer (MTC), hepatocellular carcinoma (HCC) after sorafenib, radioiodine-refractory differentiated thyroid cancer (DTC), and, more recently, unresectable neuroendocrine tumors (NETs), including pancreatic and extra-pancreatic subtypes. This retrospective analysis assessed the safety and clinical efficacy of cabozantinib in patients with advanced or metastatic solid tumors at the National Center for Cancer Care and Research (NCCCR) in Qatar.

Methods: This descriptive, retrospective cohort study included all patients treated with Cabozantinib, as non-formulary, at NCCCR during the study period between January 2023 and October 2025. Progression-free survival (PFS), time from treatment initiation to objective tumor progression or death from any cause, and adverse events (AEs) were analyzed. AEs gradings were reported using the Common Terminology Criteria for Adverse Events (CTCAE) version 5.

Results: Among 13 patients treated with cabozantinib, mRCC was the predominant diagnosis, occurring in 53.8% (n = 7) of patients. Other analyzed cases included DTC in 7.7% (1), metastatic soft-tissue sarcoma (mSTS) in 23% (3), and mHCC in 15% (2). Patients had a median age of 62 years and received cabozantinib as a median third-line therapy for a median duration of 5 months. The average progression-free survival (PFS) was 12 months in patients with mRCC, 5.5 months in mHCC, 7 months in mSTS, and 5 months in DTC. AEs were reported in 92% (12) of patients, mostly grade 1–2, with grade 3 AEs reported in 69% (9) of patients. Gastrointestinal toxicities were the most frequently reported, occurring in 92% (12) of patients. Diarrhea was the most common event, occurring in 46% (6), with grade 3 severity in 23% (3), followed by abdominal pain in 23% (3), nausea/vomiting in 23% (3), and constipation in 15% (2). Musculoskeletal AEs included fatigue, which occurred in 76.9% (10) of patients, with grade 3 severity in 15% (2), and grade 3 rhabdomyolysis was reported in one patient. Electrolyte disturbances, grades 1-3, were observed in 84.6% (11) of patients, most commonly hypophosphatemia, hypomagnesemia, hyponatremia, and hyperkalemia. Palmar-plantar erythrodysesthesia (hand-foot syndrome) was observed in 23% (3) of patients. Significant cardiovascular events included grade 3 hypertension, venous thromboembolism, and acute myocardial

infarction, each occurring in one patient (7.7%). Ocular toxicities (cataract and retinal tear), grade 3 oral mucosal events (gingivitis and mucositis), hypothyroidism, and grade 3 anemia were among other reported AEs. Treatment-related AEs led to dose reduction in 61.5% (8) and discontinuation in 38% (5) of cases.

Conclusions: In this real-world cohort, cabozantinib demonstrated promising activity across a variety of tumor types, with results similar to those documented in clinical trials. This study emphasizes the significance of vigilant monitoring and prompt detection, and management of AEs to optimize patient outcomes and treatment continuity.

References

1. Maroto P, Porta C, Capdevila J, Apolo AB, Viteri S, Rodríguez-Antona C, Martin L, Castellano D. Cabozantinib for the treatment of solid tumors: a systematic review. Ther Adv Med Oncol. 2022;14:17588359221107112. doi:10.1177/17588359221107112.
2. U.S. Food and Drug Administration. Cabozantinib—FDA approval summary (RCC, post antiangiogenic therapy) [Internet]. Silver Spring (MD): FDA; [updated 2025 Oct 7; cited 2025 Oct 7]. Available from: https://www.fda.gov/drugs/resources-information-approved-drugs/cabozantinib-cabometyx
3. Iinuma K, Tomioka-Inagawa R, Kameyama K, Taniguchi T, Kawada K, Ishida T, Nagai S, Enomoto T, Ueda S, Kawase M, Takeuchi S, Kawase K, Kato D, Takai M, Nakane K, Koie T. Efficacy and safety of cabozantinib in patients with advanced or metastatic renal cell carcinoma: a multicenter retrospective cohort study. Biomedicines. 2022;10(12):3172. doi:10.3390/biomedicines10123172
4. Domański P, Piętak M, Kruczyk B, Jarosińska J, Mydlak A, Demkow T, Darewicz M, Sikora-Kupis B, Dumnicka P, Kamzol W, Kucharz J, et al. Adverse events of cabozantinib as a potential prognostic factor in metastatic renal cell carcinoma patients: real-world experience in a single-center retrospective study. Biomedicines. 2024;12(2):413. doi:10.3390/biomedicines12020413.
5. Su J, Ni C, Wu Y, Zhang J, Cai Z, Lu J, Lin S, Wang J. Comparative efficacy and safety of cabozantinib for malignant tumors: a systematic review and meta-analysis. Expert Rev Anticancer Ther. 2024;24(5):293-302. doi:10.1080/14737140.2024.2337266.

Category: Research

ID - Country: 14136 - United States of America

Real-World Evaluation of Gastrointestinal Tolerability and Adverse Events in Myelofibrosis Patients Treated with Momelotinib

Benson Meek[1], Erin Cichonski[1] and Justin Arnall[1]

[1]*Atrium Health*

Introduction and Aims/Objectives: Momelotinib is a novel Janus kinase (JAK) inhibitor approved for the treatment of myelofibrosis (MF), particularly in patients with anemia. Clinical trials such as SIMPLIFY-1, SIMPLIFY-2, and MOMENTUM have demonstrated its efficacy in improving anemia and reducing spleen size. However, real-world data on gastrointestinal (GI) tolerability and other adverse events remain limited. GI symptoms—including nausea, vomiting, early satiety, and diarrhea—can significantly impact quality of life and adherence to therapy. This study aimed to evaluate the incidence, severity, and management of GI and other adverse events in MF patients treated with momelotinib within a single health system.

Study Design/Methods: This retrospective chart review was conducted at Atrium Health/Levine Cancer Institute in the Charlotte region. Patients were identified through the Atrium Health Specialty Pharmacy Service and included if they were ≥18 years old, had a confirmed diagnosis of primary or secondary MF, initiated momelotinib between January 1, 2023 and October 31, 2025, and had at least one follow-up visit post-initiation. Patients were excluded if they received momelotinib for non-MF indications, had incomplete records, were enrolled in interventional trials, had pre-existing GI conditions that could confound assessment, or discontinued momelotinib within 7 days for unrelated reasons. Data were extracted from electronic health records, including demographics, clinical notes, laboratory results, and supportive care interventions. Descriptive statistics were used to analyze symptom incidence, dose modifications, and supportive care strategies.

Results/Outcomes: Seven patients met inclusion criteria, with an average age of 73 years. The cohort was predominantly female (86%) and White (71%), with two patients identifying as Black. All patients were JAK2 mutation-positive; two had primary MF and five had secondary MF. Five patients had prior ruxolitinib exposure. The primary reason for initiating momelotinib

was anemia (n=6), with one patient switched due to lack of response to prior therapy. Two patients were transfusion-dependent at initiation.

GI and related adverse events were common, with nausea, diarrhea, fatigue, and loss of appetite each reported in three patients. Other symptoms included vomiting, stomach cramps, muscle cramps, and pruritis. Interventions included dose timing adjustments (n=2), dose reductions (n=3), temporary holds (n=2), and supportive care measures such as loperamide and homeopathic remedies. Three patients continued therapy with manageable symptoms; two discontinued momelotinib due to intolerance and resumed ruxolitinib. One patient experienced resolution of muscle cramps following dose reduction, and another had complete GI symptom relief after switching therapy, though anemia persisted.

Discussion of Results/Outcomes: Preliminary findings suggest that momelotinib is primarily utilized in MF patients with anemia, often following prior JAK inhibitor therapy. GI symptoms were frequent and varied in severity, with some patients tolerating therapy through supportive care and dose modifications, while others required discontinuation. These real-world experiences highlight the importance of individualized management strategies, including dose timing and proactive symptom control. The observed tolerability profile aligns with clinical trial data but underscores the need for ongoing monitoring and patient education. This study provides early real-world insights into the tolerability of momelotinib in MF patients, particularly regarding GI adverse events. While many patients can continue therapy with supportive interventions, a subset may require dose

Category: Research

ID - Country: 14245 - Australia

Reimagining patient education on systemic anticancer therapies in the digital age

Tara Isaacs[1], Marissa Ryan[2], Keshia De Guzman[1], Soraia Catapan[1] and Centaine Snoswell[1]

[1]*The University of Queensland*

[2]*Princess Alexandra Hospital, Queensland Health*

Introduction: High quality patient-clinician interactions early in the treatment journey can assist in facilitating patient-centred cancer care which focuses on patient needs, preferences and empowerment. However, achieving shared decision-making is challenging particularly at short notice, as it relies on clinician time and patients feeling informed and confident in their understanding. Integrating digital health information with patient education and counselling may enhance patient knowledge, promote shared decision-making and improve patient-centred cancer care. Additionally, the versatility of digital health information means ease of sharing with carers, and adaptations for diverse populations can be made (e.g., translations and subtitles). This project aims to create a digital video-based resource for informing patients commencing systemic anticancer therapy (SACT).

Study design: A participatory design approach will be used for this project, broken down into the following stages: 1) needs identification, 2) solution generation, and 3) testing and evaluation. Stage 1 comprises of a systematic review on pharmacist use of video-based resources, and a targeted needs assessment using consumer focus groups and thematic analysis. Stage 2 will codesign the video-based resource and model of care during a solution-focussed workshop that will involve consumers, clinicians and digital experts working together to address the needs and preferences of patients and carers. Finally, Stage 3 will evaluate the digital resource at a local public cancer service in a randomised controlled trial (RCT).

Outcomes: The systematic review completed as part of Stage 1 explored how pharmacists use video-based resources to provide patient education and their overall effectiveness for delivering health information. Thirty-seven studies were included in the review, and the majority were RCTs (n = 19, 51 %). Video education was evaluated as an adjunct to conventional pharmacist counselling (n = 14, 38 %), as a standalone health information resource (n = 13, 35 %), and as part of extended patient education interventions (n = 10, 27 %). Home access to videos resulted in more educational interventions with superior effectiveness when compared to usual care (46 % versus 21 %, respectively). Similarly, extended patient education interventions outperformed interventions without pharmacist follow-up. Studies reported high patient satisfaction, increases in knowledge, improved medication adherence, and significantly reduced counselling time in the three studies that measured this outcome.

Discussion of outcomes: Leveraging the involvement of consumers, clinicians and digital experts, who work together with researchers to produce digital solutions, has a potential for designing technologies that more closely align with the needs of the users. Successful completion of this research project will generate knowledge for designing and implementing digital patient education for patients with cancer and their carers.

Conclusion and implications: We anticipate the creation of a digital resource that enhances patient understanding of their SACT, supports shared decision-making, and promotes efficient clinical workflows through a sustainable patient-centred education model. We also hope to positively contribute to high-value care by allowing clinicians to focus on personalised counselling and education rather than routine information delivery. Evidence generated may contribute to support health policy aimed at uplifting health

Category: Research

ID - Country: 13957 - Tunisia

Standardization of Injectable Anticancer Drug Doses : Preliminary Analysis

Raafa Ben Saada[1], Imen Guiza[1], Khadija Ben chaabane[1], Myriam Iraqui[1] and Mohammed Ali Youssfi[1]

[1]Main Military Hospital instruction of Tunis

Introduction: Dose standardization (SD) of anticancer drugs involves the advance preparation of predefined doses corresponding to the most frequently prescribed regimens in clinical practice. This approach helps reduce calculation and handling errors , optimize workload in preparation units, and shorten patient waiting times. The objective of this work was to identify molecules eligible for dose standardization in our pharmacotechnics unit.

Methodology:

The mandatory eligibility criteria for SD were:

- (1) High and regular consumption (the drug must be prescribed at least once per day $\geq$ 213 times per year
- (2) Preparation stability of $\geq$ 48 hours
- Dose homogeneity (molecules with highly variable doses were excluded)

Two optional criteria were also considered:

- the demanding nature of the preparation for staff,
- Cost considerations (assessed on a case-by-case basis without a fixed threshold).

Data were collected from the pharmacotechnical unit's activity reports for 2024 and from the Summary of Product Characteristics (SmPC) of each molecule.

Results: In 2024, a total of 6,458 preparations involving 33 molecules were performed in our pharmacotechnics unit. Eleven molecules satisfied criterion (1): 5-fluorouracil (732), oxaliplatin (498), cisplatin (419), irinotecan (374), cyclophosphamide (358), trastuzumab (332), etoposide (322), carboplatin (318), gemcitabine (289), docetaxel (264), and paclitaxel (238). Five of these also fulfilled criterion (2): irinotecan (28 days at 2–8 °C), cyclophosphamide (7 days at 2–8 °C), gemcitabine (28 days), paclitaxel (7 days in 5% dextrose and 14 days in NaCl), and docetaxel (48 hours at 2–8°C). Considering criterion (4), cyclophosphamide was selected for its restrictive preparation conditions. All five selected molecules complied with criterion (5) and are, therefore, considered potentially eligible for SD in our pharmacotechnics unit.

Conclusion: This preliminary analysis enabled the identification of five potentially anticancer molecules suitable for dose standardization. Further analysis of the prescribed dose distributions for these drugs are required to confirm their eligibility for implementation.

Category: Research

ID - Country: 13888 - Turkey

The Correlation Between Public Awareness of National Cancer Screening Programs and Cancer Information Overload in Türkiye: A Study in the Pharmacy Setting

Seyda Kumbasar[1] and Songül Tezcan[1]

[1]Marmara University, Institute of Health Sciences, Department of Clinical Pharmacy, Istanbul, Türkiye

İntroduction and Aims: Cancer screening plays a vital role in early diagnosis and improving treatment outcomes. Public awareness is strongly associated with participation in screening programs. This study aimed to assess public awareness of national cancer screening methods in Türkiye and to evaluate the level of cancer information overload (CIO) in a community pharmacy setting.

Methods: This cross-sectional study was conducted in a community pharmacy between July and September 2025. Individuals aged $\geq$18 years who visited the pharmacy for any reason were included. Sociodemographic data were recorded, and participants' knowledge of national cancer screening methods was evaluated through six questions [1]. The Turkish version of the Cancer Information Overload (CIO) Scale [2] was administered via face-to-face. Data were analyzed using SPSS version 27.

Results: A total of 108 participants were enrolled (median age: 32 years; range: 19–64). Forty-four percent

reported a family history of cancer. Awareness was highest for breast cancer screening (94%), while knowledge of colorectal (54%) and cervical (66%) screening was lower. Participants with a family history of cancer showed higher awareness of breast (94%) and cervical (70%) screening ($p > 0.05$). The CIO Scale demonstrated good internal consistency (Cronbach's $\alpha = 0.789$) and the median CIO score was 19 (range: 10–32). Participants who correctly answered colorectal and cervical screening questions had significantly higher CIO scores ($p < 0.01$, $p < 0.02$, respectively).

Conclusion And İmplications: The findings indicate that awareness of breast cancer screening awareness was high among participants, whereas knowledge of colorectal and cervical screening remained limited. Individuals with a family history of cancer demonstrated greater awareness. Moderate CIO levels suggest difficulties in processing cancer-related information. These findings highlight the need for targeted educational interventions in community pharmacies to improve public knowledge of national screening programs and to manage cancer information effectively.

References

1. T.C. Sağlık Bakanlığı, Halk Sağlığı Genel Müdürlüğü. Kanser Taramaları [İnternet]. Ankara: Sağlık Bakanlığı; [erişim tarihi 25 Ekim 2025]. Erişim adresi: https://hsgm.saglik.gov.tr/tr/kanser-taramalari
2. İnci FH, Başkale H, Ak Serçekuş P. Turkish adaptation and validity-reliability study of the Cancer Information Overload Scale. Cukurova Med J. 2019;44(1):127–135. doi:10.17826/cumj.423997

Category: Research

ID - Country: 13817 - United Kingdom

The Opportunities and Challenges of Artificial Intelligence in Oncology Pharmacy: A Bopa Roundtable Perspective

Bastiaan Buijtenhuijs[1], Pinkie Chambers[2] and Matthew Watson[3]

[1]*iQ HealthTech*
[2]*UCL*
[3]*Evergreen*

Objective / Purpose: Artificial intelligence (AI) is rapidly entering healthcare, with potential to enhance safety, efficiency, and patient experience in cancer care also. We aimed to capture a, first of type for BOPA, frontline opportunities and concerns to guide responsible, practice-ready adoption in cancer pharmacy.

Study Design / Methods: A semi-structured roundtable at the British Oncology Pharmacy Association (BOPA) 2024 conference engaged 90 participants (pharmacists, pharmacy technicians, and industry colleagues). Table discussions explored perceived benefits and risks of AI in cancer pharmacy. Feedback was collated and synthesised using thematic analysis.

Results / Key Findings: Opportunities clustered across six domains. (1) Aseptic preparation and drug handling: AI-enabled automation (e.g., robotic compounding/dispensing) and real-time quality control could standardise processes, increase throughput, improve stock control, and reduce contamination or selection errors. (2) Workflow optimisation: Intelligent rota and capacity tools could balance workloads, accommodate leave, prioritise aseptic queues, and optimise chemotherapy chair utilisation. This could free up time for patient-facing activities and potentially reducing delays. (3) Clinical decision support (CDS): AI could assist protocol maintenance and SACT regimen management, surface eligibility/safety checks, and generate first-pass drafts of clinical documents, allowing pharmacists to focus on higher-value clinical judgement and counselling. (4) Toxicity and treatment monitoring: Data analytics on labs and patient-reported toxicity could prioritise reviews, predict trends, flag out-of-range results, and trigger timely interventions, with potential to reduce preventable harm. (5) Administrative and educational tasks: Drafting discharge summaries, clinic letters, training materials, and audit materials could be accelerated, with consistent formatting and version control. (6) Patient-facing applications: Plain-language summaries of complex regimens, personalised follow-up instructions, and proactive interaction/ADR triage could improve understanding, self-management, and clinic efficiency.

Concerns coalesced around: (a) Data quality and interoperability where heterogeneous source systems and incomplete data threaten accuracy and generalisability; (b) Bias and equity—under-represented groups in training data may face poorer recommendations, necessitating routine bias monitoring; (c) Trust and transparency—participants emphasised pharmacist-in-the-loop oversight and explainability for any CDS; (d) Workforce impact—anxiety about role erosion in screening/verification coexisted with recognition that AI can augment, not replace, professional expertise; and (e) Ethics and governance—privacy, consent, purpose limitation, and security must be demonstrably robust to maintain public trust.

Conclusion / Recommendations: Participants endorsed a "benefits-with-guardrails" approach: invest in data standards and validation; perform routine bias assessment; prioritise explainability and pharmacist-in-the-loop oversight; strengthen governance for privacy and security; and equip

pharmacists with AI competencies. Strategic, measured integration can realise safety and efficiency gains while preserving professional accountability and equitable care.

Category: Research

ID - Country: 13928 - Turkey

The Overlapped Parameters of Nutritional, Inflammatory, Psychosocial and Cancer-Related Factors in Patient Receiving Immunotherapy

Izgi Bayraktar[1], Taha Koray Sahin[2], Omer Dizdar[2] and Aygin Bayraktar-Ekincioglu[1]
[1]*Hacettepe University, Faculty of Pharmacy*
[2]*Hacettepe University Cancer Institute*

Introduction and Aims: Psychological distress, depression, and anxiety have been linked to immune dysregulation and may contribute to immune-related adverse events, while reducing quality of life (QoL) [1]. Nutritional and inflammatory indices such as the Prognostic Nutritional Index (PNI) and Hemoglobin, Albumin, Lymphocyte, and Platelet (HALP) score serve as objective markers of systemic inflammation and nutritional status, potentially reflecting patients' resilience to therapy [2]. This study aimed to evaluate the relationships between psychosocial parameters (depression, anxiety, stress, and QoL), PNI and HALP scores, and cancer diagnosis in patients receiving immunotherapy.

Methods: This single-center observational study was conducted at the Hacettepe-Cancer-Institute during September-October 2025.Patients were recruited on the first day of immunotherapy;depression, anxiety and stress levels were assessed by the DASS and quality of life by the EORTC-QLQ-C30.Laboratory data were obtained from hospital electronic records, and all participants provided written informed consent.PNI was calculated as 10 × serum albumin(g/dL)+0.005×lymphocyte count(/mm^3), and the HALP score as (hemoglobin×albumin×lymphocyte-count)/platelet count. Analyses were performed using R version 4.3.1.

Results: A total of 43 patients were included, with a mean age of 63±14 years; 67% were male. The most frequent cancer types were non-small cell lung cancer (NSCLC) (23%),breast cancer (21%),and malignant melanoma (16%).Most patients had an ECOG performance status of 0–1 (97%). Pembrolizumab(44%) and nivolumab plus ipilimumab (28%) were the most common regimens.Concomitant chemotherapy most frequently included carboplatin (34%) and paclitaxel (24%). Metastasis was present in 29 patients (67%), while 14 (33%) had no metastasis. Immune-related adverse events (e.g.thyroidism, skin rash, syncope /seizure) were only observed in 4(9.3%) patients in two-months period.

Depression, anxiety, and stress scores showed no statistically significant differences across cancer types ($p>0.05$). Median values were slightly higher in breast and NSCLC patients compared to other groups, suggesting a trend toward greater psychological distress in these populations. In the view of metastasis, DASS scores were similar between patients with and without metastases ($p=0.82$). No significant correlations were found between nutritional–inflammatory markers (PNI or HALP) and DASS scores ($p>0.05$).

Quality-of-life domains did not differ significantly across diagnoses ($p>0.05$). Median global QoL (QL2), physical(PF2), and role (RF2) functioning scores were lower in patients with metastases, while emotional, cognitive, and social functioning scores were comparable between groups. Higher nutritional–inflammatory indices (PNI and HALP) were modestly associated with improved role and cognitive functioning scores on the EORTC QLQ-C30 ($r_s=0.36$ and 0.32 respectively, $p<0.05$), however not correlated with global, physical, emotional, or social subdomains ($p>0.05$).

Discussion of results: Depression, anxiety, and stress levels did not differ significantly across cancer types or having metastasis, although slightly higher median scores were observed in NSCLC and breast cancer—likely reflecting their higher representation in the cohort. Higher nutritional–inflammatory indices (PNI and HALP) were modestly associated with improved functional and cognitive quality-of-life scores, suggesting that better nutritional and inflammatory status may contribute to enhanced well-being.

Conclusion: The findings are expected to provide early insight into multidimensional factors influencing treatment outcomes. Multidimensional assessment may enhance treatment safety, identify modifiable factors, and improve patients' overall quality of life.

References

1. Johns, A.C., et al., Risk Factors for Immune Checkpoint Inhibitor Immunotherapy Toxicity Among Older Adults with Cancer. Oncologist, 2023. 28(8): p. e625-e632.
2. Cheng, L. and B. Meiser, The relationship between psychosocial factors and biomarkers in cancer patients: A systematic review of the literature. European Journal of Oncology Nursing, 2019. 41: p. 88-96.

Category: Research

ID - Country: 13831 - Oman

Therapeutic drug monitoring of Amikacin among hospitalized patients in Oman,2023

Tiba Alhadad[1], Shireen Alzadjali[2] and Alka Ahuja[1]

[1]*National university of science and technology*
[2]*SQUH*

Background & Aims: Therapeutic drug monitoring (TDM) is critical in managing medications with a narrow therapeutic index, such as amikacin, due to the potential for toxicity and treatment failure. However, the extent of TDM utilization and the factors influencing its application in clinical settings remain insufficiently explored. This study aimed to evaluate the utilization of Amikacin TDM at Sultan Qaboos University Hospital (SQUH) in Oman.

Methodology: A hospital-based retrospective, observational, cross-sectional study was conducted at SQUH, Oman. The study included all Omani patients treated with amikacin for more than 48 hours, from January to December 2023. Data were extracted from a computerized database and patient files using registration numbers. Descriptive statistics summarized demographic, clinical, and microbiological data, while chi-square tests assessed associations between TDM practices and sociodemographic factors.

Results: The study comprised 222 patients, with 41.9% aged 18–64 years. Males were more prevalent (56.8%). TDM was performed in 30.2% of cases. Amikacin was used for empirical therapy (48.2%) and culture-based treatment (35.6%). The most frequently isolated pathogens were Pseudomonas aeruginosa (37.7%) and Klebsiella pneumoniae (27.5%). Appropriate dosing was associated with younger age, absence of renal impairment or dialysis, and infections with Gram-negative bacteria ($P < 0.05$). TDM utilization was higher among patients under 18 years (52.9%, $p < 0.001$), those with cystic fibrosis (CF), surgical site infections (SSI), infections with Pseudomonas aeruginosa (65.4%, $p = 0.024$), and those receiving prolonged therapy (≥1 week) (87.8%, $p < 0.001$).

Conclusion: The study identified key factors influencing TDM practices, including patient age, infection type, treatment duration, and isolated pathogens. Increasing TDM use, especially for younger patients and those undergoing prolonged therapy, could enhance amikacin dosing accuracy and minimize adverse effects.

Keywords: Therapeutic drug monitoring, aminoglycosides, dosage adjustment, Oman.

Category: Service Evaluation

ID - Country: 13915 - Italy

Application of ESMO-MCBS Modules to Off-Label Treatments for Hematologic Malignancies: Assessment of Clinical Benefit in an Italian Hospital Setting

Patricia Madalina Budau[1], Roberta Aldieri[2], Matilde Scaldaferri[1] and Maria Rachele Chiappetta[1]

[1]*Hospital Pharmacy Unit, AOU Città della Salute e della Scienza di Torino*
[2]*School of Specialization in Hospital Pharmacy, University of Turin*

Background and Objectives: Evaluating the clinical benefit of a treatment is essential to support therapeutic and regulatory decisions, such as the authorization of off-label regimens by the Internal Pharmaceutical Committee. The European Society for Medical Oncology (ESMO) developed the ESMO-Magnitude of Clinical Benefit Scale (ESMO-MCBS) to quantify the value of anticancer therapies. However, for hematologic malignancies, only the evaluation modules are currently available, without published official scores. This work aimed to apply the ESMO-MCBS modules to off-label hematologic treatments used in an Italian hospital, to assess their feasibility and usefulness as standardized decision tools.

Materials and Methods: Reference trials were identified for three off-label regimens: Ibrutinib combined with immunochemotherapy according to the TRIANGLE protocol in mantle cell lymphoma (NCT02858258); Gilteritinib with azacitidine and venetoclax in FLT3-mutated acute myeloid leukemia (NCT04140487); and Lenalidomide plus rituximab in follicular lymphoma (NCT00137605). ESMO-MCBS modules were selected according to study type, therapeutic intent (curative or non-curative), primary endpoint and number of arms: Module 1 for ibrutinib (randomized, potentially curative), Module 3 for gilteritinib-based therapy (single-arm, high-need setting), and Module 2b (≥12 months) for lenalidomide-rituximab (non-curative RCT with PFS endpoint). Published study efficacy, toxicity and quality-of-life data were analyzed and used to complete the appropriate scoring forms.

Results: In mantle cell lymphoma, ibrutinib (Module 1) achieved an A-PT score, corresponding to the highest level of clinical benefit in a potentially curative setting,

with improved event-free survival and manageable toxicity. In acute myeloid leukemia, the gilteritinib/azacitidine/venetoclax regimen (Module 3) showed in newly diagnosed patients an ORR of 96%, with an initial score of 3 downgraded to 2 for ≥30% grade ≥3–4 toxicity and in relapsed/refractory cases an ORR of 27%, with an initial score of 2 downgraded to 1 for the same reason. In follicular lymphoma, lenalidomide/rituximab (Module 2b) demonstrated a clear PFS advantage of 9.3 versus 2.3 years with rituximab alone (HR 0.57; P = 0.013). The preliminary score of 3 was downgraded by one level for absent OS and QoL assessment and by another for incremental toxicity, as treatment discontinuation exceeded 10%. It was then upgraded by one level for a long-term plateau beyond 5 years and an absolute PFS benefit (≥10%) at 3 years, yielding a final Grade 2.

Discussion and Conclusions: Applying ESMO-MCBS modules to hematologic therapies proved feasible and informative for hospital decision-making. Module selection according to study design and intent enabled consistent assessment of clinical benefit across heterogeneous regimens, highlighting both high-impact and limited-benefit cases. The scale objectively integrates efficacy, toxicity, and quality-of-life data, supporting off-label and regulatory evaluations. In particular, the Module 2b application to lenalidomide/rituximab confirmed a sustained and clinically meaningful benefit, supporting its consideration under Law 648/96 in Italy. In the absence of official ESMO scoring for hematologic malignancies, systematic application of the modules provides a transparent and reproducible approach to estimate the real therapeutic value of new treatments and to harmonize decision-making processes among healthcare institutions.

References

Dreyling M, Doorduijn J, Giné E, et al. Ibrutinib combined with immunochemotherapy with or without autologous stem-cell transplantation versus immunochemotherapy and autologous stem-cell transplantation in previously untreated patients with mantle cell lymphoma (TRIANGLE). Lancet. 2024;403(10441):2293-2306. doi:10.1016/S0140-6736(24)00184-3

Short NJ, Daver N, DiNardo CD, et al. Azacitidine, venetoclax, and gilteritinib in newly diagnosed and relapsed or refractory FLT3-mutated AML. J Clin Oncol. 2024;42(13):1499-1508. doi:10.1200/JCO.23.01911

Kimby E, Taverna C, Lamy T, et al. Six-month rituximab-lenalidomide regimen in advanced untreated follicular lymphoma: SAKK 35/10 trial 10-year update. Blood Adv. 2025;9(7):1712-1719. doi:10.1182/bloodadvances.2024014840

Category: Service Evaluation

ID - Country: 13919 - United Kingdom

Assessing the Impact of Pharmacy Hub on Treatment Waiting Time in Cancer Patients

Tsoi, Chris[1]
[1] *Imperial College Healthcare NHS Trust*

Introduction: Previous national surveys have unveiled a critical crisis in aseptic services for preparing intravenous systemic anti-cancer therapy (IV SACT), leading to delayed administrations and impairing the quality of life of cancer patients (1). Likewise, our patients, pharmacy and nursing staff have expressed concerns about long waiting times for IV SACT.

There has been a lack of research on a standard approach to addressing the ever-increasing pressure on cancer services. We have adopted the UK SACT board's recommendations (2) by establishing a pharmacy hub in the chemotherapy day care to streamline the pharmacy workflow. The new hub model aims to provide 'quick wins' for our patients, which includes meeting our Trust's target of delivering IV SACT within one hour of scheduled administration.

Methods: A pharmacy hub was established in July 2024 and became fully operational in November of the same year. The hub serves as a primary point of contact for nursing and scheduling staff, as well as treatment release units. Patient data were collected from 11th November 2024 to 11th September 2025. This evaluation assessed the impacts of the novel services on the timeliness of IV SACT deliveries for oncology patients being treated at the chemotherapy day unit. Two performance indicators were the proportion of IV SACT delivered within one hour and the average delays. The early phase, from November 2024 to January 2025, was compared with the late phase, from July to September 2025, to evaluate improvement over time.

Results: A significant improvement has been demonstrated in the late phase. The proportion of IV SACT doses released at the scheduled time increased from 48.3 % to 57.0 % and one hour or less increased from 30.8 % to 31.9 % ($\chi^2 2$) = 140.4, $p < .001$). The median delays (IQR) in pharmacy IV SACT services have significantly reduced from 53 minutes (IQR 27–90) to 35 minutes (IQR 16–62) ($p < .001$). Both key performance indicators showed a consistent trend over time in the statistical process control (SPC) charts.

Discussions: The pharmacy hub model provides novel local data that could inform future benchmarking and demonstrates a 'quick win' for oncology patients in view of improving the timeliness of IV SACT services.

Although there are initiatives in recognising pharmacy capacity (3), there is a lack of literature examining the streamlining of pharmacy workflow. This study presents real-world data from a substantial post-implementation period, suggesting that the pharmacy hub enhances efficiency and reduces delays in the treatment release process.

This innovative service not only centralises the releasing procedures but also improves coordination between the pharmacy, nursing, and booking teams. The streamlined workflow fosters effective communication between units, minimising bottlenecks during peak times by allowing for the earlier identification of prescription or scheduling issues, thereby preventing same-day delays.

Conclusion: Establishing a pharmacy hub for the coordination of IV SACT significantly improved the timeliness of chemotherapy delivery within our Trust. The findings indicate enhanced operational efficiency and improved service quality, thereby supporting wider adoption of pharmacy-led hub models to optimise chemotherapy workflows.

References

1. Duncombe R, Foreman E, Biliune J. A National Evaluation of Capacity in Intravenous Systemic Anti-Cancer Therapy (IV SACT) Preparatory Services. BOPA Committee 2022. https://www.bopa.org.uk/resources/national-capacity-ivsact-evaluation/ (Accessed October 2025)
2. UK SACT Board. General principles to support SACT aseptic capacity pressures. UK SACT Board – Publications. 2023. https://www.uksactboard.org/_files/ugd/638ee8_84eebe8e6ea04543bf08b43dd3e2b6d7.pdf (Accessed October 2025)
3. BOPA Committee. Letter to the Secretary of State for Health and Social Care – Capacity challenges in oncology departments preventing the effective delivery of cancer drugs. BOPA. 2023. https://www.bopa.org.uk/letter-to-the-secretary-of-state-for-health-and-social-care-2023-capacity-challenges-in-oncology-departments-preventing-the-effective-delivery-of-cancer-drugs/ (Accessed October 2025)

Category: Service Evaluation

ID - Country: 13956 - Tunisia

Assessment of compliance with good preparation practices in a centralized cytotoxic unit

Rahma katfaoui[1], Khadija Ben chaabane[1], Imen Guiza[1], Raafa Ben Saada[1], Myriam Iraqui[1], Islem Ben Regaya[1] and Mohammed Ali Youssfi[1]

[1]Main Military Hospital instruction of Tunis

Introduction: Compliance with Good Preparation Practices (GPP) is essential to ensure the quality, safety, and traceability of cytotoxic preparations. The objective of this study was to assess the level of compliance within a centralized cytotoxic preparation unit (UPCC) by developing an updated audit grid aligned with the 2023 GPP standards.

Methods: An audit grid was developed based on two existing reference frameworks: the ChimioPREP cross-audit grid (Omédit Normandie) and the cross-audit grid developed by the University of Lille. These tools were compared, merged, and then aligned with the recommendations of the 2023 GPP.

The final grid covered two main themes: Management and Quality (hygiene, risk management, information systems, personnel, controlled-atmosphere areas, and equipment) and Preparation Process (prescription, pharmaceutical validation, preparation, storage, control and release, delivery and receipt).

The audit was conducted by three pharmacists working within the UPCC. Data were collected and analyzed using Excel to assess compliance with current practices and identify areas for improvement.

Results: The overall compliance score for the Management and Quality component was 92%, reflecting good overall adherence. Strengths included hygiene (94%), risk management (92%), and controlled-atmosphere areas (97%). In contrast, the personnel component, particularly training and evaluation (82%), represented an area for improvement, notably regarding the validation of staff practices, which includes aseptic process simulation testing.

The Preparation Process theme showed an overall compliance score of 87%. Prescription and receipt/delivery reached 100% compliance, followed by preparation at 89%, storage at 86%, and validation at 84%. The main areas for improvement concerned control/release (84%), primarily due to the absence of a formalized procedure for managing residual products and the lack of a structured quality control step, which is currently being implemented.

Discussion of results: The audit highlights that structured evaluation tools are essential to enhance the safety, quality, and reliability of practices in high-risk drug preparation units.

Category: Service Evaluation

ID - Country: 14200 - Australia

Cancer Care Closer to home

Guru Sule[1], Lesley Dawson[1], Dr. Sylvia Lee[1], Karlee Excell[1] and Kim Toohill[2]

[1]Ipswich hospital, West Moreton Health, Queensland, Australia
[2]Ripley hospital, West Moreton Health, Queensland, Australia

Introduction: The West Moreton Health Service (WMHS) strategic plan(1) aims to improve access to care closer to home. As an Oncology service, our focus is on enhancing access to safe, reliable care in the right place for rural cancer patients, guided by the Queensland Remote Chemotherapy Supervision's Guide (QRECS) 2019 to ensure sustainable care in rural and remote areas.

Aims/ Objectives:

1. Increased patient satisfaction with access to cancer care in rural settings, through reduced travel time
2. Enhanced staff satisfaction through improved support and access to resources in rural facilities
3. Decreased failed-to-attend (FTA) rate for rural oncology patients.

Methods: To capture the perspectives of patients, staff, and the organisation, the project team employed a range of diagnostic tools. A Root Cause Analysis (RCA) was conducted using the fishbone technique to identify the underlying causes of problems and barriers. Data was gathered through staff and patient satisfaction surveys. System data from CHARM (the Pharmacy Oncology Information Management System) and the integrated electronic medical record (ieMR) was used to develop a Big Picture Mapping (BPM), which effectively led to implement the "Care Closer to Home" initiative, as outlined in the QRECS guideline (2). A gap analysis was conducted (9). The project utilized Six Sigma (6), Lean Thinking methodologies (5) and Theory of Constraints, to guide the clinical re-design process. The focus was on creating value for rural patients by maintaining continuous care flow, developing supporting systems, policies, procedures, and eliminating waste, such as unnecessary travel time, fuel costs, parking fees, and time away from families and work commitments(3,4).Barriers related to providing care closer to home were identified (9), including staff educational needs, confidence levels, transport issues and the delivery and supply of chemotherapy to rural sites6. These limitations, along with the need to align services with QRECS guidelines (2), were critical factors in the planning process. To manage change across the rural sites, the ADKAR model (7) was utilized. Additionally, the SCARF Tool (8) was employed as a communication tool.

Key Findings/ Discussion: This data-driven approach allowed for the identification of key inefficiencies, that aligned with organisational goals and led to following three solutions:

1. Telehealth for Cancer Services (10): Implemented telehealth to deliver cancer care at rural sites, improving access to specialised services closer to home.
2. Direct Chemotherapy Delivery (11,14): Established direct delivery of compounded chemotherapy from an external facility to rural sites, including PBS Mapping to enhance sustainability and address medication costs.
3. Staff Education and Training (12,13): Provided comprehensive training for staff to administer chemotherapy at rural sites, with Clinical Facilitators upskilling nurses and pharmacy staff for effective succession planning.

Results: By October 2025, 29 patients saved over 12,000 km in travel, with more than 230 occasions of service at Ipswich Hospital. Nine rural nurses have been trained to administer anti-cancer treatments.

Conclusion: This clinical re-design project was part of an ongoing quality improvement initiative. Launched in May 2024, the Tele-Oncology Service at West Moreton Health (WMH) has enabled low-risk cancer patients to receive treatment closer to home at 4 rural hospital sites within West Moreton Health Services.

References

1. West Moreton Health Strategic Plan 2021-2025, https://www.westmoreton.health.qld.gov.au/sites/default/files/inline-files/strategic-plan.pdf
2. https://www.health.qld.gov.au/__data/assets/pdf_file/0029/818246/QReCS-Guide-2019-Compressed.pdf
3. Ōno Taiichi (2019) Toyota production system: Beyond large-scale production. New York: Productivity Press.
4. Victorian cancer patient experience survey tool project (health.vic.gov.au)
5. Mazzocato P, Savage C, Brommels M, et al, Lean thinking in healthcare: a realist review of the literature, BMJ Quality & Safety 2010;19:376-382.

6. Nave D, 2002, 'How to compare Six Sigma, Lean, and the Theory of Constraints: a framework for choosing what's best for your organisation', Quality Progress, March 2002, pp.73-78.
7. Wong Q, Lacombe M, Keller R, Joyce T, O'Malley K. Leading change with ADKAR. Nursing Management. 2019;50(4):28-35
8. Rock D. SCARF: A brain-based model for collaborating with and influencing others. NeuroLeadership journal. 2008;1(1):1-9
9. Australian Commission on Safety & Quality in Healthcare, National Safety in Quality Healthcare Services Standards (2019) National Safety and Quality Health Service Standards
10. Enhancing Chemotherapy Capabilities in Rural Hospitals: Implementation of a Telechemotherapy Model (QReCS) in North Queensland, Australia, Sabe Sabesan et al, Journal of Oncology Practice 2018 14:7, e429-e437
11. Health Canada. Workplace hazardous materials information system–official national site. Ottawa (ON): Available from: www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/index-eng.php
12. Preventing occupational exposure to antineoplastic and other hazardous drugs in health care settings. Atlanta (GA): US Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health;2004. Available from: www.cdc.gov/niosh/docs/2004-165c.
13. National Institute for Occupational safety and Health. NIOSH alert: preventing occupational exposures to antineoplastic and other hazardous drugs in health care settings.2004:1-4
14. httpps://www.worksafe.qld.gov.au/_data/assets/pdf_file/0006/88710/guide-handling-cytotoxic-related-waste.pdf

Category: Service Evaluation

ID - Country: 13314 - Tunisia

Cost-Effectiveness Of Letermovir Prophylaxis Versus Preemptive Therapy For Cytomegalovirus After Allogeneic Hematopoietic Stem Cell Transplantation: A Literature Review

Linda Bouallegue[1], Yosr Trabelsi[2], Tarek Kamergi[2], Leila Achour[2], Ikram Fazaa[2], Asma Ben Romdhane[2] and Chema Drira[3]

[1]Bone Marrow Transplant Center of Tunisia, Tunis, Tunisia
[2]Faculty of Pharmacy of Monastir, Monastir, Tunisia
[3]Research Laboratory «Microbiology of Children and Immunocompromised»(LR18ES39), University of Tunis El Manar, Tunisia

Introduction and Aims/Objectives: Reactivation of Cytomegalovirus (CMV) remains one of the most feared complications among allograft stem cell transplant (ASCT) patients. Until recently, CMV prevention relied on preemptive therapy (PET). The introduction of letermovir, the first anti-viral agent targeting the CMV terminase complex, has changed this approach by significantly reducing clinically relevant infections. Nevertheless, the high acquisition cost of letermovir has raised important questions regarding its economic value and its integration into routine clinical practice. We aim, by this review, to evaluate the cost-effectiveness of letermovir compared with PET in ASCT patients.

Study Design/Methods: A systematic literature search was conducted in the PubMed, Google Scholar, and ScienceDirect databases, covering the period from October 2018 to May 2024. The review was conducted in accordance with the PRISMA 2020 guidelines. The search terms used included "Letermovir," "CMV prophylaxis," "Hematopoietic Cell Transplantation," and "Cost-effectiveness." Studies evaluating the cost-effectiveness of letermovir prophylaxis in ASCT patients were included. Articles focusing solely on clinical efficacy without an economic analysis were excluded.

Results/Outcomes: Out of the 288 results of the initial query, seven studies met the inclusion criteria and were included in this review. Analysis of these studies report that, compared with PET, the use of letermovir as a prophylaxis treatment resulted in gain of quality-adjusted life years (QALYs) ranging from +0.41 to +0.46, despite an increase of direct medical costs. The incremental cost-effectiveness ratios (ICERs) range from €22,500 to $59,000 per QALY gained, remaining below the commonly accepted cost-effectiveness thresholds in the United States of America, Europe (Italy, Portugal, the United Kingdom), and Asia (Hong Kong). Sensitivity analyses, both univariate and probabilistic, confirm the robustness of these results, with mortality emerging as the most influential factor.

Discussion of results/outcomes: The available studies conducted across diverse healthcare systems support the conclusion that letermovir prophylaxis is both clinically effective and economically justified. Although the acquisition cost of letermovir is relatively high, these expenses are counterbalanced by the reduction of CMV rehospitalizations, pre-emptive therapy related neutropenia, CMV disease and graft-versus-host disease. The variability observed among studies mainly reflects differences in their economic models, such as the time horizon considered, the type of cost perspective adopted (payer, hospital, or societal). These variations highlight the importance of conducting locally adapted

pharmacoeconomic evaluations to account for each country's specific healthcare structure, pricing, and reimbursement policies.

Letermovir prophylaxis appears to be a cost-effective strategy for preventing CMV reactivation in ASCT recipients. By improving survival and quality of life while maintaining an acceptable cost-utility profile, letermovir represents a major step-forward in post-transplant infectious disease management. Its widespread adoption may optimize healthcare resource allocation and improve patient outcomes, particularly if supported by real-world studies.

Category: Service Evaluation

ID - Country: 13821 - Canada

Creating an EMR-integrated documentation tool for Drug Therapy Problems to measure key performance indicators in a new pharmacist-led oral chemotherapy program

Amy Su[1] and Pauline Bal[1]
[1]*Halton Healthcare*

Objective / Purpose: Oakville Trafalgar Memorial Hospital (OTMH) launched a new pharmacist-led oral chemotherapy program in May 2025. To evaluate its performance, it was necessary to identify relevant and practical to measure Key Performance Indicators (KPIs). The next dilemma was that current use of free-text pharmacy documentation in the Meditech Expanse Electronic Medical Record (EMR) did not produce easily extractable and measurable data.

A specialized documentation tool for Drug Therapy Problems (DTPs) was developed and integrated into the EMR. This DTP tool facilitates accurate clinical documentation and enables later data extraction to assess if KPIs are being achieved. This tool's goal is to provide quantitative data demonstrating the program's impact on patient care and to inform future funding decisions for oncology pharmacy initiatives at OTMH.

Study Design / Methods: A literature search was conducted to gather information regarding KPIs or metrics collected at other cancer therapy institutions across North America. The search, spanning 2021–2025, used databases and search engines including Medline, CINAHL, Proquest, PubMed, and Google Scholar. Of 26 articles screened, 10 articles focusing on oral chemotherapy and metric tracking were included.

KPIs of interest pertaining to DTPs were identified. The DTP tool was then built to provide answers to the list of KPIs of interest with help from the OTMH pharmacy informatics team. Stakeholder meetings were held with OTMH Cancer Clinic leadership, Informatics, and the Clinical Documentation Committee to approve the new tool's creation.

Results / Key Findings: The literature search yielded various metrics, categorized under safety, effectiveness, adherence, financial, and value. Safety and value metrics were primarily chosen for evaluation, as they best reflect the pharmacist-led program's performance. Financial, effectiveness, and adherence metrics were generally omitted due to the lack of an associated dispensing pharmacy and a call-back program, as were metrics susceptible to confounding from other departmental programs (e.g. drug access, urgent care clinic).

The following KPIs, which could not be tracked with existing free-text documentation, were incorporated into the final DTP tool:

–Number of patients with DTPs identified.
–Numbers and types of DTPs identified.
–Number of drug interactions addressed.
–Number of anti-cancer drug therapy modifications made.
–Number of pharmacist recommendations accepted.
–Number of various outcomes and impact on patient care (e.g., no interventions, modifications, referrals).
–Number of adverse effect prophylaxis or supportive care measures implemented.
–Number of patients with monitoring parameters addressed (e.g., ECG, blood work).

The DTP tool intentionally limits free-text fields, primarily utilizing drop-down lists and check boxes, to capture all necessary KPI data for reporting and evaluation.

Conclusion / Recommendations: A DTP documentation tool was successfully created and integrated into the EMR. It simultaneously serves documentation purposes and allows for easy data extraction to evaluate the performance of OTMH's first oral chemotherapy program. This tool can be adopted by other oncology pharmacy programs seeking to evaluate the impact of their oral anti-cancer drug initiatives. The next phase, implementing a call-back program, will require a new documentation tool to better assess adherence metrics.

References

1. McFarlane T, Rozhannaa Sothilingam, Fernandes O, Houle SKD, Lo J, Abadi S, et al. Development of Ambulatory Oncology Clinical Pharmacy Key Performance Indicators Using a Modified Delphi

Consensus Approach. JCO Oncology Practice. 2025 Jul 30;
2. Passey DG, Healy R, Qualls J, Halwani A, Sauer BC. Pharmacist-led collaborative medication management programs for oral antineoplastic therapies: A systematic literature review. Journal of the American Pharmacists Association. 2021 May;61(3):e7–18.
3. Mathur AD, Maiers TA, Andrick BJ. Impact of a pharmacist-led telehealth oral chemotherapy clinic. American Journal of Health-System Pharmacy. 2022 Feb 5;
4. Herledan C, Cerfon MA, Baudouin A, Larbre V, Lattard C, Poletto N, et al. Impact of pharmaceutical care interventions on multidisciplinary care of older patients with cancer: A systematic review. Journal of Geriatric Oncology. 2023 May;14(4):101450.
5. Fahey, G. Barbour, S. Golf, M. et al. Oral Chemotherapy Program Metrics: Results of a National Survey. Journal of Hematology Oncology Pharmacy. 2023 ;13(2):85-94.

Category: Service Evaluation

ID - Country: 12481 - Qatar

Enhancing Medication Safety, Operational Efficiency, and Cost Reduction through Optimization of Automated Dispensing Cabinet Use in Oncology and Hematology Inpatient Units at NCCCR

Taghrid Abu Hassan[1], Elham Alsagga[1], Amir Nounou[1], Arwa Nasser[1], Dr. Anas Hamad[1], Muna Mohamed[1] and Priya Binumon[1]

[1]Hamad medical corporation - National Center for Cancer Care and Research - Doha, Qatar.

Introduction: Automated Dispensing Cabinets (ADCs) serve as a vital element in contemporary hospital pharmacy systems, including those at NCCCR. ADCs enhance the efficiency of medication distribution while improving inventory management and reducing delays in patient care. By offering secure real-time access at the point of care, ADCs help mitigate medication errors and aid in regulatory compliance while facilitating streamlined workflows for nursing and pharmacy personnel, this contributes to enhanced patient safety and improved resource utilization (ISMP, 2019; WHO, 2017; Poon et al., 2010). Global research indicates that ADCs can markedly decrease dispensing errors while optimizing workflow efficacy and ensuring adherence to medication safety standards (Tu et al., 2023; Alanazi et al., 2022).

Objective: The aim is to assess the performance and effectiveness of ADCs operations at the National Center for Cancer Care and Research (NCCCR), Hamad Medical Corporation, Doha, Qatar, in 2024, focusing on medication loading/unloading efficiency, management of discrepancies, oversight of override processes, user account maintenance updates, as well as initiatives related to medication relocation and cost savings, all aimed at refining processes to enhance patient safety.

Methods:

1. Load/Unload Utilization: Medication activity tracked over 180 days at 11 ADCs stations for 200 medications to monitor stock and replenishment.
2. Overrides: Daily review of override events, categorized by urgency and type; inappropriate overrides prompted OVA reporting and targeted education.
3. Discrepancies: Daily and monthly analysis of discrepancy reports; forwarded to head nurse for follow-up and staff education.
4. User Account Review: Annual review ensured correct access for active users, deactivating inactive accounts.
5. Medication Relocation/Cost-Saving: Low-demand medications were relocated to higher use ADCs to reduce wastage and prevent expiration.

Results:

- Load/Unload & Utilization: 133 medications loaded, averaging ≈12 medications per station. Dispensing via ADCs was completed in 5–10 minutes, compared to ≥45 minutes using non-ADCs methods, representing an ≈83% improvement in delivery efficiency per loaded medication.
- Discrepancies: 1,465 discrepancies recorded (averaging ~4/day), an excellent achievement. Head nurse follow-up and education sessions were established to maintain performance within the accepted benchmark.
- Overrides: 1,045 override events (averaging ~2.8/day). Daily tracking, OVA reporting, and education interventions were implemented, with 87 events/month set as the accepted threshold for safe and compliant override practices.
- User Updates: Annual review ensured 219 active users maintained correct access.
- Medication Relocation / Cost-Saving: Redistribution prevented expiration and minimized waste (averaging ~40/month), achieving 9,200 QAR in operational savings.

Discussion and Conclusion: The ongoing, data-centric management of ADCs operations at NCCCR during

2024 has resulted in significant enhancements in the efficiency of medication delivery, leading to decreased patient waiting periods and improved overall workflow. Consistent oversight, OVA reporting, and focused educational initiatives have promoted safe medication practices and collectively led to a decrease in discrepancies and inappropriate overrides while ensuring strong user access control. Strategic relocation of medications has reduced waste and contributed to operational cost-effectiveness. These five practices create a sustainable framework for 2025 that supports optimized ADC functionality and fosters safe, efficient, and reliable medication delivery for oncology and hematology inpatients.

References

1. Institute for Safe Medication Practices (ISMP). Guidelines for the Safe Use of Automated Dispensing Cabinets. ISMP; 2019. https://www.ismp.org/system/files/resources/2019-11/ISMP170-ADC%20Guideline-020719_final.pdf
2. Poon, E. G., et al. "Effect of Bar-Code Technology on the Safety of Medication Administration." The New England Journal of Medicine, 2010; 362(18):1698–1707. https://www.nejm.org/doi/full/10.1056/NEJMsa0907115
3. World Health Organization (WHO). Medication Without Harm. WHO; 2017. https://www.who.int/initiatives/medication-without-harm
4. Tu, H. N., et al. "Reducing Medication Errors by Adopting Automatic Dispensing Cabinets in Critical Care Units." Journal of Medical Systems, 2023; 47(1):52. https://pubmed.ncbi.nlm.nih.gov/37103718/
5. Alanazi, M. F., et al. "Impact of Automated Drug Dispensing System on Patient Safety: A Cross-Sectional Observational Study." Pharmacy Practice, 2022; 20(1):2744. https://www.pharmacypractice.org/index.php/pp/article/view/2744

Category: Service Evaluation

ID - Country: 13905 - United Kingdom

Evaluating Oncology Pharmacy Practice Against Key Research Priorities for Older Adults with Cancer: An Evaluation to Inform Practice and Research

Kavita Kantilal[1] and Kumud Kantilal[2]

[1]*University Hospitals Sussex NHS Foundation Trust*

[2]*University College London*

Introduction and Aims/Objectives: Older adults with cancer represent a growing and complex patient population, often experiencing multimorbidity, polypharmacy, and age-related physiological changes that impact cancer treatment outcomes. Despite this, oncology services frequently lack tailored pharmaceutical care strategies for this group. In response, the International Society of Geriatric Oncology (SIOG) have identified five research priorities to guide pharmaceutical care: (a) Polypharmacy Methodology and Definitions, (b) Suboptimal Medication Use, (c) Comorbidities and Geriatric Syndromes, (d) Underrepresented Groups, and (e) Polypharmacy Interventions (1). Oncology pharmacists affiliated with the British Oncology Pharmacy Association (BOPA) and the International Society of Geriatric Oncology (SIOG) have attempted to address these research priorities. This evaluation aimed to assess the published work by these affiliated members against the five research priorities, with a view to identifying gaps and informing future service development and research.

Study Design/Methods: Four key publications by the affiliated members of BOPA and SIOG were selected for evaluation (2–5), using the five research priorities (1) as an analytical framework. Each reference was assessed for its contribution to the five research priorities, with findings mapped to current oncology pharmacy practice. The evaluation focused on identifying evidence gaps, implementation barriers, and opportunities for service improvement.

Results/Outcomes:

1. Polypharmacy Methodology and Definitions:
   The literature highlights inconsistent definitions of polypharmacy, ranging from ≥5 medications to broader interpretations involving medication appropriateness. Standardised terminology to support clinical decision-making and research comparability is recommended (1). This lack of consensus, limits benchmarking and intervention design.
2. Suboptimal Medication Use:
   Studies report high rates of potentially inappropriate medications (PIMs) among older adults with cancer, yet deprescribing remains underutilised. The need for pharmacist-led medication reviews is emphasised (4), but current services rarely embed these systematically.
3. Comorbidities and Geriatric Syndromes:
   Functional, cognitive, and frailty assessments are underrepresented in pharmacy-led oncology care. Literature supports integrating geriatric assessment tools to guide medication decisions, yet these are not routinely used in oncology pharmacy practice due to time constraints and lack of training.
4. Underrepresented Groups:
   Older adults with frailty, cognitive impairment, or limited social support are often excluded from

clinical trials and structured medication consultations. The literature calls for inclusive approaches, but cancer services lack mechanisms to ensure equitable access to pharmaceutical care.

5. Polypharmacy Interventions:

   Evidence supports pharmacist-led interventions to reduce PIMs and improve outcomes, including deprescribing protocols and shared decision-making models. However, few oncology pharmacy services have implemented or evaluated such interventions, representing a missed opportunity for impact.

Discussion of Results/Outcomes: The evaluation reveals significant gaps between evidence-based recommendations and current oncology pharmacy practice. While the literature provides a robust framework for improving care, implementation remains limited. Barriers include lack of standardised tools, insufficient training in geriatric principles, and absence of formal evaluation of pharmacist-led interventions.

Conclusion and Implications: This evaluation highlights the need for oncology pharmacy services to align more closely with established research priorities for older adults with cancer. Standardising polypharmacy definitions, embedding geriatric assessments, and developing inclusive, pharmacist-led interventions are key steps forward. Future research should focus on piloting and evaluating these approaches to improve medication safety, patient experience, and clinical outcomes.

References

1. Nightingale G, Mohamed MR, Holmes HM, Sharma M, Ramsdale E, Lu-Yao G, et al. Research priorities to address polypharmacy in older adults with cancer. Journal of Geriatric Oncology. 2021 Jul 1;12(6):964–70.
2. Turner JP, Kantilal K, Kantilal K, Holmes HM, Koczwara B. Optimising Medications for Patients With Cancer and Multimorbidity: The Case for Deprescribing. Clinical Oncology. 2020 Sep;32(9):609–17.
3. Kantilal K, Kantilal K, Nightingale G, Ramsdale E. How-to guide for medication reviews in older adults with cancer: A Young International Society of Geriatric Oncology and Nursing & Allied Health Interest Group initiative. Journal of Geriatric Oncology. 2022 Nov 1;13(8):1283–6.
4. Walsh DJ, Kantilal K, Herledan C, Nightingale G, Slavova-Boneva V, Moreno-Martínez ME, et al. Medication assessment in older adults with cancer – Current practices in clinical pharmacy. Journal of Geriatric Oncology [Internet]. 2023 May 19 [cited 2023 May 30];0(0). Available from: https://www.geriatriconcology.net/article/S1879-4068(23)00128-5/fulltext
5. Herledan C, Falandry C, Huot L, Poletto N, Baudouin A, Cerfon MA, et al. Clinical impact and cost-saving analysis of a comprehensive pharmaceutical care intervention in older patients with cancer. Journal of the American Geriatrics Society. 2024; 72(2): 567-578

Category: Service Evaluation

ID - Country: 13898 - Pakistan

Evaluating the Chemotherapy Drug Tender System in Cancer Tertiary Care Hospitals in Pakistan: A Retrospective Study

Soban Ahmed Khan[1], Adeel Siddiqui[1], Saba Mazhar[1], Hassan Bin Rasheed[1], Omar Akhlaq Bhutta[1] and Shoaib Shammas[1]

[1]Shaukat Khanum Memorial Cancer Hospital & Research Centre

Objective: Timely access to affordable chemotherapy drugs is vital for effective cancer care. In Pakistan, institutional tender systems aim to ensure cost-effective supply, but delays, supplier non-compliance, and non-tender purchases can undermine efficiency and increase costs.

This study aimed to evaluate the effectiveness and efficiency of the institutional chemotherapy drug tender system at Specialized Oncology Hospitals in Pakistan. Specifically, it assessed the proportion of chemotherapy drugs supplied by the first tender distributor compared to second and third tender suppliers, identified procurement delays, and quantified the financial burden arising from deviations from first-tender procurement.

Study Design: A retrospective quantitative study was conducted across all three hospitals of Shaukat Khanum Memorial Trust: Lahore, Peshawar, and Karachi. Procurement data for chemotherapy drugs tendered between July 2024 and June 2025 were extracted from the Hospital Information System and procurement department records. All tendered drugs, with one to three designated suppliers per item (first being lowest-cost), were included. Data collected included supplier rankings, quantities procured, delivery timelines, and associated costs. Descriptive statistics were used to evaluate supplier performance, procurement delays, and financial impact, while adherence to institutional benchmarks for 24-hour purchase order processing and 10-day supplier delivery was analyzed to assess process efficiency.

Results: Of 77 generic chemotherapy drugs on the formulary, 61 (79%) generics were tendered, encompassing

93 tendered items(strength-wise) across up to three suppliers each. Analysis of 1,159 Material Receiving Notes (MRNs) enterprise wide revealed that 61.6% of supplies were fulfilled by first tender suppliers, 7.6% by second, 3.0% by third, and 27.8% through non-tender procurement. First tender fulfilment rates were lowest in Peshawar Hospital (58.3%) and highest in Karachi Hospital (73.6%), while Lahore Hospital showed the greatest dependence on non-tender supplies (29.7%). Order processing times averaged 3 days and 11 hours enterprise wide, exceeding the institutional target of 24 hours. The average enterprise-wide procurement lead time was 17 days and 14 hours, surpassing the 10-day benchmark, with Lahore exhibiting the longest delays (approximately 20 days). Enterprise wide, 77.9% of MRNs were fully delivered, while 22.1% experienced partial deliveries. Financial analysis across the enterprise revealed an additional expenditure of PKR 137 million (≈ USD 490,000) due to reliance on higher-cost secondary, tertiary, and non-tender sources. The highest excess cost occurred in Lahore (PKR 68 million ≈ USD 240,000), followed by Peshawar (PKR 57 million ≈ USD 200000) and Karachi (PKR 13 million ≈ USD 46000).

Discussion: The evaluation revealed major inefficiencies in the chemotherapy drug tender system, especially in first-tender fulfillment, order processing, and supplier delivery. Inefficacy in tender system is associated with cost burden (1). Reliance on non-tender procurement caused financial losses and delayed drug availability, potentially disrupting patient care. Strengthening coordination between procurement and clinical units, enforcing 24-hour purchase order processing and 10-day delivery policies, and enhancing supplier accountability can enhance efficiency and supply reliability, and align operations with institutional standards, as procurement delays can lead to drug shortages (2). Our study highlights the need for continuous monitoring of procurement in resource-limited oncology settings to ensure cost-effective and uninterrupted chemotherapy supply.

References

1. Apostol GL. A Study on Factors Influencing Drug Prices Among National Public Hospitals in the Philippines. Value in Health. 2018 Sep 1;21: S10.
2. Adhikari B, Ranabhat K, Khanal P, Poudel M, Marahatta SB, Khanal S, Paudyal V, Shrestha S. Procurement process and shortages of essential medicines in public health facilities: A qualitative study from Nepal. PLOS Global Public Health. 2024 May 2;4(5): e0003128.

Category: Service Evaluation

ID - Country: 14202 - United Kingdom

Glycaemia screening and monitoring in patients with or at risk of diabetes undergoing anti-cancer therapy with corticosteroids– quantification for service planning

Dola Awoyemi[1], Lewis Mitchell[1], Assana Assadi Haghi[1], Sylvia Tan[1], Elaine Tomlins[1], Daniel Morganstein[1]
[1]The Royal Marsden Hospital NHS Foundation Trust

Introduction and Aims: Diabetes and cancer are both major health burdens in the UK. Approximately 20% of cancer patients also have diabetes, and systemic anti-cancer therapies (SACT), particularly when combined with corticosteroids, can exacerbate hyperglycaemia. The Joint British Diabetes Societies (JBDS) and the UK Chemotherapy Board recommend the early identification and management of patients at high risk of developing hyperglycaemia. This includes not only those with a known diagnosis of diabetes but also individuals with risk factors such as obesity, family history, previous gestational diabetes, polycystic ovary syndrome, and certain ethnic backgrounds. We aimed to evaluate the prevalence of diabetes, pre-diabetes and high-risk features among cancer patients receiving SACT, and to assess current screening practices in order to identify resource requirements and inform future service models.

Method: Retrospective analysis of patients receiving short-course dexamethasone with SACT (including Chemotherapy, Immunotherapy, Targeted Therapy, Hormone Therapy) over a six-month period (February -July 2025) . Electronic health records were reviewed to determine the proportion of outpatients with a diagnosis of diabetes, pre-diabetes or predisposing risk factors and to assess whether these patients were appropriately screened prior to commencing SACT to identify those at high risk of developing diabetes.

Results: A total of 145 patients were included in the final analysis. Of these 68% (n=99) had at least one risk factor for steroid-induced hyperglycaemia. The most common risk factor was age> 70 years (31%, n= 45), followed by BMI >30 and BAME ethnicity (each 28%, n= 41). Other frequently identified risk factors included prediabetes and pre-existing diabetes (both 13.8%, n=20), as well as a family history of diabetes and gestational diabetes (each 2% n=3). Screening for diabetes and its risk factors among patients commencing SACT was poorly documented.

However, 67% of patients completed one of two standardised peri-operative questionnaires that contains questions on diabetes diagnosis and/or anti-diabetic medication use. HbA1c monitoring within the year prior to starting SACT was performed in 49.7% of patients, with 22.8% (n=33) conducted at the cancer hospital, 19% (n=28) by GP's or community providers, and 7.6% (n=11) by other hospitals. The average HbA1c was 40.9 mmol/mol.

Conclusion: Nearly 70% of patients receiving SACT with steroids are at risk of developing diabetes and therefore require appropriate hyperglycaemia risk management. To align clinical practice with JBDS-UK SACT board guidance on glycaemia management in cancer patients, a multidisciplinary steering committee is implementing a pathway to screen, monitor and manage steroid and SACT-induced hyperglycaemia.

Category: Service Evaluation

ID - Country: 13951 - Tunisia

Impact of a Playful Educational Training Program on the Management of Cytotoxic Vial Breakage among Healthcare Staff

Rahma katfaoui[1], Raafa Ben Saada[1], Khadija Ben chaabane[1], Myriam Iraqui[1], Imen Guiza[1], Islem Ben Regaya[1] and Mohammed Ali Youssfi[1]
[1]Main Military Hospital instruction of Tunis

Introduction: Healthcare professionals handling cytotoxic agents are exposed daily to accidental risks such as vial breakage, bag leakage, or needlestick injuries. The prevention of these risks is based on appropriate staff training. This study aimed to evaluate the impact of theoretical and practical training, combined with a playful simulation, on improving knowledge and response reflexes during a cytotoxic vial breakage incident.

Methods: We conducted an interventional study among pharmacy technicians and interns in the Pharmacotechnics Unit of the Main Military Instruction Hospital of Tunis. After a pre-test, participants received 30-minute training combining theoretical instruction, procedural review, breakage kit demonstration, and video support, followed by an immediate post-test. One week later, a 5-minute digital simulation via EDUCAPLAY, consisting of five interactive games related to managing a cytotoxic vial breakage, assessed response time, compliance with procedures, and environmental and human safety. A final summary video was then shown.

Results: In total, 24 participants were included (14 interns, 6 trainers and 4 trainees), 25% of whom have already received training on managing a cytotoxic vial breakage accident. The mean score increased from 4.52/8 on the pre-test to 6.82/8 on the post-test, representing an improvement of over 20%. The most frequent pre-test errors involved wearing only a single pair of gloves and using bleach to disinfect the contaminated area.

The EDUCAPLAY simulation reinforced safety reflexes : the mean reaction time was 4 min 28 s, with 86% of protocol steps completed correctly. The most critical difficulty remained the proper sequencing of donning personal protective equipment.

Discussion of results: The combination of theoretical and practical training with playful simulation significantly improved the knowledge and reflexes of healthcare professionals, thereby strengthening the safety of cytotoxic incident management.

Category: Service Evaluation

ID - Country: 12262 - Qatar

Impact of Cost-Effective Interventions on Efficiency, Waste Reduction, and Patient Safety in Inpatient Pharmacy Services

Elham Alsagga[1], Rami Abu Mousa[1], Taghrid Abu Hassan[1], Amir Nounou[1], Dr. Anas Hamad[1], Arwa Nasser[1], Priya Binumon[1] and Mishael Alanazi[1]
[1]Hamad medical corporation

Introduction: Escalating healthcare expenditures continue to place substantial pressure on hospital systems, necessitating the optimization of resources without compromising patient care. Inpatient pharmacy services represent a vital component of hospital operations and significantly contribute to overall healthcare costs.

Given the complexity of medication management, procurement and storage to preparation and dispensing strategies that promote both cost efficiency and patient safety are essential.

Effective medication management is essential to prevent wastage, preserves product integrity, and ensures continuity of therapy. Moreover, optimizing pharmacy workflows and medication distribution processes play a pivotal role in enhancing operational performance, reducing avoidable losses, and strengthening the overall quality and safety of healthcare delivery.

Objectives: To assess the impact of targeted operational interventions on reducing medication wastage, improving inventory efficiency, and achieving substantial cost savings at the National Center for Cancer Care and Research (NCCCR), Hamad Medical Corporation,

Doha, Qatar, from 2023 through September 2025. The specific strategies evaluated include replacing repackaging with a standardized relabeling protocol and optimizing the physical distribution and stock levels of medications within Automated Dispensing Cabinets (ADCs) and establishing a systematic, cross-facility redistribution network for near-expiry medications.

Methods:

1. Relabeling: Medications were maintained in their original manufacturer packaging, and standardized barcoded labels indicating the medication name and expiry date were applied directly to each package. A double-checking process was performed by a second staff member to verify label accuracy and ensure correct identification before dispensing.
2. Narcotic Medications and Non-Narcotics: A dynamic inventory management system for ADCs was introduced, involving the physical reallocation of cabinets to optimize stock distribution. This was supported by a proactive redistribution protocol using a First-In-First-Out (FIFO) principle, where approaching expiry in low-demand wards were systematically transferred to high-demand units within NCCCR or to other hospitals. While maintaining strict regulation compliance in the case of narcotics.
3. Supplementary strategies: Additional measures included optimizing reorder points, enhancing staff training, and conducting regular audits and reporting on near-expiry stock. Oracle-based expiry alerts facilitated timely interventions.

Results: Relabeling: Preserved original expiry dates and avoided repackaging costs, saving QAR 46,572. Additionally, 62.7% of medications were kept in their original manufacturer packaging, preventing exposure to light and moisture and extending shelf life by up to six months compared to repackaged items.

Narcotic Medications: Redistribution within NCCCR and transfers to other hospitals saved QAR 11,400, ensuring consistent access to essential pain medications.

Non-Narcotic Medications: ADC optimization and relocation across wards and facilities prevented expiry-related losses and treatment delays, yielding QAR 149,700 in savings.

Total cost savings exceeded QAR 207,000, with improved medication availability, reduced waste, and strengthened continuity of patient care.

Conclusion: Implementing low-cost, high-impact strategies such as relabeling and ADC optimization enhanced both cost efficiency and a marked reduction in medication waste.

Beyond financial metrics, the program led to strengthened inventory control, enhanced regulatory compliance for controlled substances, improved medication safety, and improved the continuity of patient care by ensuring medication availability.

References

1. Institute for Safe Medication Practices (ISMP). Guidelines for Safe Preparation of Compounded Sterile Preparations. ISMP; 2020.
2. World Health Organization (WHO). Good Pharmacy Practice: Standards for Quality of Pharmacy Services. WHO; 2011.
3. American Society of Health-System Pharmacists (ASHP). Handling of Oral Solid Medications and Medication Packaging for Patient-Specific Use. Am J Health-Syst Pharm. 2016;73(10):e255–e273.
4. Al-Jedai A, Qaisi S, Al-Meman A. Pharmacy practice in Saudi Arabia: Hospital pharmacy. Saudi Pharm J. 2016;24(5):484–489.

Category: Service Evaluation

ID - Country: 13902 - Pakistan

Improved Prescription Appropriateness by Developing & Integrating Medication Duplication Alert in Oncology Clinical Pharmacist Menu in Cancer Hospital

Soban Ahmed Khan[1], Ehsan Elahi[1], Saleha Nadeem[1], Omar Akhlaq Bhutta[1] and Muhammad Tahir Aziz[1]

[1]Shaukat Khanum Memorial Cancer Hospital & Research Centre

Introduction/Objective: Within the in-patient electronic prescribing system at our hospital, the chemotherapy protocol and current-medication modules run separately. In this setting, supportive drugs prescribed in current-medication module may unintentionally duplicate chemo-regimen components if a prescriber misses an existing order and re-enters, it in electronic record. Duplicate medication orders are multiple active orders for the same drug or therapeutic class. This increases the risk of duplicate medication error and jeopardizes the patient's safety.

In this study, we aimed to design and assess the effectiveness of an automated medication duplication alert (MDA). This alert is designed to review a patient's record for duplicate medication orders and to notify the

pharmacist during a prescription review within the clinical pharmacist menu. The effectiveness of this alert will be evaluated by its ability to identify duplicate orders, thereby reducing prescribing errors and improving prescription appropriateness.

Method: A quantitative retrospective pre & post intervention study was conducted at Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan. Admitted patients prescribed chemotherapy protocol and supportive drugs via online modules during the same hospitalization were included. Data of duplicate medication order was retrieved from HIS from October 2020 to March 2021 (MDA pre-implementation phase) and from June 2021 to November 2021 (MDA post-implementation phase). Information related to duplicate doses administered, time taken by pharmacist to resolve the issue of duplicate medication in the patient's record (chemo protocol and in current-medication modules), and number of pharmacists' interventions to resolve the issue of duplicate medication during both phases, was recorded. Statistical package for the social sciences (SPSS) v.27.0 was used to compare mean differences between pre & post implementation groups.

Results: A total of 324 duplicate medication orders from pre-implementation phase and 509 from post-implementation phase were identified for 23 drugs. After MDA implementation, duplicate dose administration reduced to 61.53%, with mean duplicate dose administration decreased from 0.91 (SD=2.021) in pre, to 0.35 (SD=0.721) in post-implementation phase, (p-value < 0.001). Time taken by the pharmacist to intervene duplicating drug order reduced to 81.85% with mean time decreased from 31.40 minutes (SD=51.62) in pre, to 5.70 minutes (SD=11.20) in post-implementation phase, (p-value < 0.001). Post MDA implementation, pharmacists' interventions increased, from 27.5% (n=89) to 84.3% (n=429), while non-interventions dropped from 72.5% (n=235) to 15.7% (n=80), (p-value < 0.001), in pre & post implementation phases, respectively.

Conclusion: Integration of the Medication Duplication Alert into the oncology clinical pharmacist menu significantly enhanced prescription safety and workflow efficiency. The alert effectively reduced duplicate dose administration and shortened pharmacist intervention time, while increasing proactive pharmacist interventions, reflecting improved prescription appropriateness. By leveraging clinical decision support automation, oncology pharmacists were able to detect and rectify duplicate medication orders in real time, thereby reducing the risk of adverse drug events. These findings highlight the importance of embedding intelligent alert systems within electronic prescribing workflows to strengthen medication safety and optimize pharmacotherapy in oncology practice.

Category: Service Evaluation

ID - Country: 13986 - Brazil

Integration Between Hospital Units in the Management of Non-Standardized Medications: Strengthening Rational Use, Sustainability, and Financial Optimization

Letícia Carvalho[1] and Patricia Ribeiro Fatureto Gavioli[1]

[1]Hospital Sírio Libanês

Introduction and Objectives: Rational use of medicines is a constant challenge in healthcare services, especially given the high cost and complexity of non-standardized medications. The lack of integration between hospital units previously increased the risk of drug expiration, waste, and significant financial impact. In response, a collaborative interunit project was developed to implement shared inventory management, focusing on sustainability and waste reduction.

Objective: To reduce the volume of idle stock of high-cost, non-standardized oncology medications between January 2025 and July 2025 through structured interunit collaboration.

Study Design / Methods: The project was conducted in a structured manner, following sequential stages that ensured goal achievement. Each phase applied quality management tools to systematize analysis, planning, and execution, including Ishikawa diagrams (root cause analysis), the 5W2H action plan, and performance indicators.

A multidisciplinary team of pharmacists and inventory analysts from three hospital units was established. Using brainstorming and Pareto analysis, the team identified critical causes contributing to stock stagnation.

A structured communication flow was implemented across units through a shared spreadsheet and periodic monitoring meetings. This enabled transparent visualization of available stock and prioritization of internal drug redistribution between units.

Results / Outcomes: The project baseline showed an idle stock value of BRL 1,010,241.54, representing 100% of the non-standardized oncology drugs evaluated.

Following implementation of improvement actions, a progressive reduction in idle inventory was observed. By July 2025, the idle stock decreased by BRL 543,171.55, corresponding to an absolute reduction of 53.76% compared to the initial value.

These results demonstrated that collaborative inventory management across hospital units can generate measurable financial optimization, prevent wastage of high-cost oncology drugs, and promote sustainable use of non-standardized medications.

Discussion and Conclusion: The initiative proved feasible, safe, and applicable across different institutional contexts, consolidating integration among hospital units. The project fostered organizational sustainability by reducing waste, optimizing resources, and reinforcing rational medication use. Continuous monitoring of indicators will ensure long-term impact, and expansion to other therapeutic classes and strategic supplies is planned.

This experience highlights that interunit collaboration and the use of structured quality tools can effectively improve inventory management in oncology pharmacy practice while advancing financial efficiency and environmental responsibility.

References

Organização Mundial da Saúde (OMS). Promoting rational use of medicines: core components. WHO Policy Perspectives on Medicines. Geneva: World Health Organization; 2002.

Agência Nacional de Vigilância Sanitária (Brasil). Resolução RDC n° 67, de 8 de outubro de 2007. Dispõe sobre boas práticas de manipulação de preparações magistrais e oficinais para uso humano em farmácias. Diário Oficial da União; 2007.

Carvalho M, Silva A, Pereira L, et al. Strategies for reducing medication waste and improving financial sustainability in hospital oncology pharmacies. J Oncol Pharm Pract. 2023;29(5):1150-1157.

Goff DA, Karam GH, Haines ST. Impact of collaborative interhospital initiatives on antimicrobial and medication stewardship programs. Am J Health Syst Pharm. 2020;77(8):604-612.

Schenkel B, Oliveira V, Dalton C, et al. Sustainable practices in oncology pharmacy: inventory optimization and waste reduction initiatives. Eur J Hosp Pharm. 2022;29(6):310-316.

Category: Service Evaluation

ID - Country: 13987 - Morocco

Inventory Of Returns of Chemotherapy Preparations Not Administered During the COVID-19 Pandemic: A Retrospective Analysis in a Pediatric Hematology-Oncology Department

Yassine Eddahoumi[1], Oumaima Elqabissi[1], Hind Qajia[1] and Mustapha Bouatia[1]

[1]*Faculty of Medecine and Pharmacy of Rabat*

Background: The COVID-19 pandemic disrupted oncology services globally. Our pediatric hematology-oncology department's cytotoxic preparation unit experienced increased returns of non-administered chemotherapy preparations, representing substantial clinical, financial, and pharmaceutical challenges including medication waste, increased costs, and suboptimal resource utilization.

Aim and Objectives: To comprehensively evaluate patterns, characteristics, and underlying causes of non-administered chemotherapy preparation returns during the COVID-19 pandemic, identifying frequently returned medications, administration routes affected, personnel involved, and modifiable factors contributing to medication waste.

Material and Methods: A descriptive retrospective study was conducted over 18 months during the COVID-19 pandemic. Data were collected through standardized return forms capturing patient demographics, drug characteristics, administration routes, personnel initiating returns, and reasons for non-administration. Statistical analysis using SPSS version 25.0 included descriptive statistics, chi-square tests, Fisher's exact test, ANOVA, and logistic regression. A p-value <0.05 was considered statistically significant.

Results: Among 253 returns from 210 patients , the male-to-female ratio was 1.46 with mean age 8.0±4.2 years. Most frequently returned medications were Vincristine (20.6%), L-Asparaginase (19.4%), Methotrexate (17.8%), and Doxorubicin (7.9%). Chi-square analysis revealed significant associations between drug type and return reason ($\chi^2=42.8$, $p<0.001$), with Vincristine showing higher dosage change rates (28.8% vs. 14.2%, $p=0.012$) and L-Asparaginase associated with packaging integrity issues (24.5% vs. 12.3%, $p=0.019$).Intravenous preparations dominated returns (57.3%), followed by intramuscular (31.6%),

intrathecal (10.7%), and subcutaneous (0.4%). Administration route significantly associated with personnel initiating returns (χ^2=18.6, p=0.005): physicians more frequently returned intrathecal preparations (63.0%, p=0.008), while nurses predominantly returned intravenous preparations (55.2%, p=0.032).Head nurses initiated 49.4% of returns, physicians 38.8%, and patients/families 11.9%. Primary return reasons included patient absence (14.2%), dosage changes (14.2%), compromised packaging (12.3%), unprepared retroceded medications (11.1%), and postponed treatments (8.3%). Additional factors (39.9%) included adverse events (7.1%), clinical deterioration (5.9%), and COVID-19 disruptions (9.5%).Logistic regression identified independent predictors of patient absence: younger age (OR=1.12, 95%CI:1.04-1.21, p=0.003), distance >50km (OR=2.8, 95%CI:1.4-5.6, p=0.004), and COVID-19 restrictions (OR=3.2, 95%CI:1.6-6.4, p=0.001). ANOVA showed significant age differences across return categories (F=4.8, p=0.003), with younger patients (6.2±3.1 years) experiencing more absence-related returns versus older patients (9.8 ±4.5 years) with dosage-change returns.

Conclusion and Relevance: Non-administered chemotherapy preparation returns pose significant challenges in pediatric oncology, particularly during public health crises. This study identified modifiable factors including communication gaps, workflow inefficiencies, and pandemic disruptions. Statistical analysis revealed significant drug-specific associations suggesting targeted intervention opportunities. Implementing risk-stratified preparation protocols, enhanced pharmacy-clinical communication, just-in-time preparation for high-risk medications (Vincristine, L-Asparaginase), standardized patient confirmation procedures, and improved inventory management could optimize anticancer drug circuits with potential 15-20% cost savings. Future prospective studies with cost-benefit analyses and intervention trials are warranted.

References

Jolivet A, Cadier B, Djabarouti S, Gandia P, Rioufol C, Bussières JF. Use, wastage and costs of anticancer drugs in a French hospital oncology unit: analysis and improvement. Eur J Hosp Pharm. 2018;25(6):320-5.

Fasola G, Aita M, Marini L, Follador A, Fantin D, Caruso B, et al. Drug waste minimisation and cost-containment in medical oncology: two-year results of a feasibility study. BMC Health Serv Res. 2008;8:70.

Thi-Thanh-Van N, Frison E, Génin M, Duhamel A, Faure K, Décaudin B. Impact of COVID-19 on pediatric oncology drug consumption and waste: a retrospective study. J Oncol Pharm Pract. 2021;27(8):1876-84.

Loriot MA, Savoldelli M, Lebrun-Vignes B, Descamps V. Cost analysis of antineoplastic drug waste in a French hospital. Int J Clin Pharm. 2017;39(4):804-7.

Becker C, Meier CR, Schneider J, Jick SS. Medication wastage in oncology: a retrospective analysis of medication returns in a Swiss hospital. Eur J Hosp Pharm. 2020;27(e1):e42-e46.

Category: Service Evaluation

ID - Country: 13466 - France

Optimizing Cytotoxic Drug Preparation: Comparative Analysis of Closed-System Transfer Devices and Development of a Practical Protocol

Maria Garibotti[1], Beatrice Marie Dit Dinard[1], Pierre-Yves Berthier[1] and Anne-Yvonne ABAUT[1]

[1]CH Fougères

Introduction and Aims/Objectives: Cytotoxic drugs are routinely prepared under cytotoxic safety cabinets (CSCs) within centralized reconstitution units. However, two situations at our institution required alternative preparation methods: (1) urgent Methotrexate (MTX) preparation for ectopic pregnancy in gynecology, and (2) CSC malfunction in the cytotoxic reconstitution unit. These constraints prompted the evaluation of closed-system transfer devices (CSTDs) and the development of two practical tools to support safe preparation outside CSCs: a dedicated MTX protocol for gynecology and a reference table covering 31 cytotoxic drugs.

Study Design/Methods: A comparative evaluation of four CSTDs—Chemfort® (Simplivia), Chemolock® (ICU Medical), Qimono® (Vygon), and PhaSeal® (BD)—was conducted using manufacturer data, published literature, and direct handling by pharmacy staff. Each device was assembled and tested in a simulated preparation context to assess usability and ergonomics. Seven criteria were evaluated: ergonomics, safety, compatibility (NIOSH list), assembly complexity, aseptic duration, dead volume, and cost. Each device received a score per criterion, and a global score was calculated as the average of these ratings.

Results/Outcomes: Chemfort® scored highest (17/20), demonstrating strong compatibility with hazardous drugs, low dead volume (0.061 mL), and intuitive assembly. Its vial adaptors and syringe connectors were easy to manipulate, even in constrained environments. A key differentiator was its universal vial adaptor, compatible with both 13 mm and 20 mm vial necks—two standard diameters encountered in cytotoxic drug packaging. Unlike Chemolock®, PhaSeal®, and Qimono®, which each require two separate vial adaptor references to accommodate both sizes, Chemfort® simplifies logistics

by using a single reference. This reduces the number of CSTDs to stock, minimizes mismatch risk, and streamlines workflows.

Chemolock® followed (15/20), with good usability but a higher dead volume and documented incompatibility with one solvent. PhaSeal® and Qimono® scored lower due to complex assembly, limited flexibility, and higher cost.

A stepwise MTX preparation protocol was developed for gynecology, integrating protective equipment, workspace setup, device selection, and waste management. In parallel, a reference table was created to guide the selection of Chemfort® components for 31 cytotoxic drugs, based on vial diameter, final container type, and context. The table also redirects users to the appropriate preparation protocol depending on the drug and scenario.

Both tools were validated internally and are now used to support routine and exceptional cytotoxic preparation. They enable staff to maintain safety standards while adapting to logistical constraints and serve as a foundation for future training and harmonization.

Discussion of Results/Outcomes: The evaluation highlighted Chemfort® as the most suitable device, balancing safety, usability, and cost. Its selection was reinforced by its inclusion in the regional hospital group's procurement. The MTX protocol and reference table support safe cytotoxic preparation outside CSCs, ensuring continuity and staff protection.

Conclusion and Implications: Chemfort® was selected for implementation based on its technical performance and cost-effectiveness. Training and monitoring will ensure safe and consistent use.

Despite being a single-site evaluation without contamination or satisfaction testing, it provided strong evidence for implementation. Ongoing monitoring of safety and user feedback will support continuous improvement and adaptability to other institutions.

Category: Service Evaluation

ID - Country: 13867 - Pakistan

Optimizing STAT Medication Management through Informatics-Driven System Controls: A Quality Improvement Service Evaluation

Omar Akhlaq Bhutta[1], Muhammad Rehan Khan[1] and Shoaib Shammas[1]

[1]Shaukat Khanum Memorial Cancer Hospital and Research Centre

Introduction and Aims/Objectives: STAT medication orders are intended for urgent use, typically requiring administration within 30 minutes. However, inappropriate STAT prescribing can overload pharmacy and nursing workflows, delay true emergencies, and compromise patient safety. At Shaukat Khanum Memorial Cancer Hospital & Research Centre (SKMCH&RC) in Lahore and Peshawar, internal audits revealed 28–36% of medication orders in Lahore and 41–49% in Peshawar were marked STAT without clinical justification. This high STAT burden led to delays in services, and both nursing and pharmacy teams found it hard to meet target compliance. This project aimed to reduce inappropriate STAT prescribing and improve medication turnaround times (TAT) through hospital information system (HIS) interventions and prescriber education.

Study Design/Methods: A before-and-after service evaluation was conducted at SKMCH&RC Lahore and Peshawar. Baseline data (January–June 2023) were compared with post-implementation results (July 2023–December 2024). Interventions included: (1) introduction of new frequencies ("ONCE-to be administered within 2 hours" & "NOW-to be administered within 1 hour") for non-emergency requests and system based popup alerts to prefer "ONCE or NOW" over STAT, where necessary (2) HIS-based restrictions limiting STAT orders to a multidisciplinary team recommended & Pharmacy & Therapeutic Committee (P&TC) approved list of life saving medications (generics) and dosage forms; (3) Separate screens were added with dashboard showing alerts incase of STAT orders for better staff awareness and timely actions. (4) mandatory indication entry for STAT orders; and (5) structured physician and nurse education sessions. Monthly HIS reports captured total orders, percentage of STAT orders and proportion with administration delays (>30 minutes). Descriptive statistics and trend analysis were applied.

Results/Outcomes: At Lahore, baseline STAT burden averaged 33% with up to 15% delayed administrations. Following intervention, STAT orders decreased to 7–8% and delays to 2% by December 2024—a 75% overall reduction. In Peshawar, initial STAT rates of 41–48% with 6–12% delays declined to <1% with zero delays sustained for 12 consecutive months, representing a >95% reduction. Workflow efficiency improved substantially, and genuine STAT medications consistently met the 30-minute administration benchmark. There was no increase in missed doses or adverse patient outcomes. Both sites reported smoother coordination between clinical and pharmacy teams and more equitable workload distribution.

Discussion of Results/Outcomes: This project demonstrates that informatics-driven controls integrated into prescribing workflows can significantly reduce STAT misuse while maintaining safety. HIS restrictions ensured that only clinically appropriate medicines are ordered as STAT (emergency), and alternative frequencies like "ONCE & NOW" cater to all urgent orders without adding extra burden on healthcare teams. Continuous audit-feedback and incorporation of STAT compliance indicators into departmental key performance metrics sustained improvements. Replication of results at two geographically distinct sites confirmed scalability. Embedding such digital safeguards aligns with global best practices in medication safety and underscores the value of technology-enabled governance in oncology pharmacy operations.

References

Institute for Safe Medication Practices (ISMP). Guidelines for Timely Administration of STAT Medications. ISMP Medication Safety Alert; 2020.
World Health Organization. Medication Safety in High-Risk Situations. WHO Global Patient Safety Challenge; 2021.

Category: Service Evaluation

ID - Country: 13886 - United Kingdom

Pharmacist medication review for patients preparing for Chimeric Antigen Receptor T-cell Therapy – A Service Evaluation

Madeleine Norbury[1] and Robert Lown[1]
[1]*University Hospital Southampton NHS Foundation Trust*

Introduction & Aim: Chimeric antigen receptor T-cell (CAR-T) therapy involves the ex vivo genetic engineering of autologous T-cells to recognise and kill cancer cells. Supportive care includes antimicrobials, antifungals, corticosteroids and anti-epileptics. There is potential for drug interaction through CAR-T mechanism and/or supportive care. Therefore, medication use may be restricted, or a wash-out period recommended, at apheresis, lymphodepletion, CAR-T infusion and post-CAR-T (1).

A new service has been initiated whereby a pharmacist undertakes an out-patient medication review before patients commence lymphodepletion and CAR-T. This is via telephone or face-to-face and integrated with the Personalised Care and Support Planning review.

This service evaluation aims to investigate patient and clinician experiences and views relating to the service and assess medication review intervention outcomes.

Method: The Pharmacist intervention, involving seventeen patients receiving CAR-T therapy was evaluated [May-December 2024]. Data relating to patient medications and review outcomes were recorded, anonymised and analysed using Excel.

Patient experience:

Patients were invited via SMS to participate in a telephone interview comprising of questions adapted from the validated PSQ-18 and MacMillian Patient Questionnaire (2,3). Questionnaire and SMS underwent Patient and Public Involvement review. Patients who were unable to recall their CAR-T pathway or delegated the medication review were excluded.

Clinician experience:

All clinicians who undertake CAR-T consent and review at in-patient admission were invited via email to complete a Microsoft Form survey focusing on views and experiences relating to the pharmacist intervention. Data were analysed using Excel.

This service evaluation did not require ethical approval.

Results: Thirteen medication reviews resulted in pharmacist interventions including: changes in anticoagulation plans and discontinuation of nasal steroids, interacting and complementary and alternative medicines (CAM). One intervention highlighted drug allergy/intolerance resulting in a modified regimen.

The patient experience evaluation involved eight respondents after exclusions. Patients reported the review was very useful, provided an opportunity to ask questions and understand their medicines, alleviated their worries and made a difficult process easier.

Five of 10 clinicians provided intervention feedback. All were confident in the information received from the pharmacist (strongly agreed). All agreed any issues raised are appropriately referred, making a positive difference to managing their patients in terms of timeliness, effectiveness and efficiency. Clinicians reported the service was valuable and flagged up issues which would otherwise have been missed.

Discussion & Conclusion: There is no known pharmacist medication review service pre-CAR-T in the UK.

At a challenging point in their treatment pathway, patient experience is vital. Medication reviews contribute to this - preparing patients for treatment and encouraging autonomy. Evidence suggests, patients who are more prepared, feel more in control of their situation, with improved recovery, decreased stress and increased ability for self-management (4,5). Although a small study population, this service evaluation suggests the novel service benefits both patients and clinicians. A wider evaluation will be conducted in one year once the service has fully imbedded. There is potential for this service to be developed at other CAR-T centres and in other treatment pathways comprising advanced therapies or allogeneic stem cell transplantation.

References

1. Kröger, N., Gribben, J., Chabannon, C., Yakoub-Agha, I., & Einsele, H. The EBMT/EHA CAR-T Cell Handbook. Springer; 2022.
2. Marshall, G. & Hays, R. The patient satisfaction questionnaire short form (PSQ-18). Santa Monica, CA: Rand; 1994.
3. Macmillan. Patient questionnaire for cancer care reviews [Internet]. 2024. [cited 2025 May 13]. Available from: https://www.macmillan.org.uk/dfsmedia/1a6f23537f7f4519bb0cf14c45b2a629/14540-10061/Cancer-Care-Review-Questionnaire.
4. NHS. NHS Long Term Plan [Internet]. UK: NHS, 2019 [cited 2025 May 13]. Available from: https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan.
5. Macmillan. Principles and guidance for prehabilitation within the management and support of people with cancer [Internet]. UK: Macmillan, 2024 [cited 2025 May 13]. Available from: https://www.macmillan.org.uk/healthcare-professionals/news-and-resources/guides/principles-and-guidance-for-prehabilitation.

Category: Service Evaluation

ID - Country: 13992 - Brazil

Pharmacoeconomics of Blinatumomab Through Dose Optimization in the Clean Room of a Hospital Oncology Pharmacy

Patricia Ribeiro Fatureto Gavioli[1], Michelly Venceslau Vendramini Simoes[1], Alline Barreto Paulino[1], Jullia Bell Cardoso Bomfim[1] and Andressa Rodolfo de Oliveira[1]

[1]Hospital Sírio Libanês

Introduction: Chemotherapy protocols require individualized doses, which often result in leftovers during preparation. Blinatumomab is a high-cost medication indicated for the treatment of Acute Lymphoblastic Leukemia. It is administered by continuous intravenous infusion, according to chemotherapy protocols. After reconstitution, the vial can be stored for up to 24 hours under refrigeration. Unlike ready-to-use infusion bags containing the drug and stabilizing solution, which remain stable for up to 10 days under refrigeration, the reconstituted vial has limited stability (24h refrigerated), leading to the frequent disposal of leftovers and consequent financial loss. Therefore, this study proposes the handling and advance preparation of the medication in a cleanroom environment, following good compounding practices and aseptic techniques, with the goal of optimizing resources, reducing waste, and promoting financial and environmental sustainability.

Objectives:

- To optimize the use of Blinatumomab through the reuse of reconstituted vial leftovers, in accordance with RDC No. 67/2007 guidelines;
- To reduce waste and promote the rationalization of resources, contributing to the financial sustainability of the healthcare service;
- To foster environmentally sustainable practices by minimizing the disposal of hospital chemical waste.

Methods: Based on information provided in the drug's package insert, it was identified that the Blinatumomab infusion solution remains stable for up to 10 days when stored under refrigeration. From this information, an individualized patient dose-tracking chart was created and made available in the compounding area to assist in the organization, preparation, and monitoring of administrations, allowing for the reuse of leftover medication.

Results: The leftovers generated during compounding were reused in a standardized manner, stored in EVA bags previously prepared with diluent and stabilizing solution. Remaining vials were reintegrated into stock through a computerized system with batch and expiration date registration, ensuring traceability and safety. To measure outcomes, a comparative report was prepared containing the number of vials saved and the reduction of chemical waste generated between January and July 2025. This analysis enabled the creation of a monthly indicator for vials saved. During this period, 26 vials of Blinatumomab were saved. This represents the volume of medication that was not discarded, resulting in reduced chemical waste and an avoided purchase cost of BRL 294,827.06.

Conclusions: The reuse of Blinatumomab leftovers during preparation led to increased vial savings, reduced chemical waste disposal, and decreased operational costs, promoting both financial and environmental sustainability in the healthcare service. The care and critical role of the hospital pharmacist in drug preparation contribute to the optimization of processes and strategic resources, ensuring the quality of services and patient care.

Category: Service Evaluation

ID - Country: 12485 - United Kingdom

Real-World Evaluation of Neutropenia Incidence and Outcomes Following Introduction of Prophylactic GCSF with Sacituzumab Govitecan (SG) at the Royal Marsden Hospital (RMH)

Chloe Chan[1], Emma Crewe[2], Mariam Nasser[3], Alicia Okines[4], Marina Parton[2], Emma Kipps[2], Alistair Ring[4], Stephen Johnston[4] and Nicolò Battisti[2]

[1]*None*

[2]*The Royal Marsden NHS Foundation Trust UK*

[3]*The Royal Marsden NHS Foundation Trust UK / University Hospital Dorset NHS Foundation Trust*

[4]*The Royal Marsden NHS Foundation Trust UK / The Institute of Cancer Research, London*

Sacituzumab govitecan (SG) is a Trop-2–directed antibody–drug conjugate approved by MHRA for previously treated unresectable or metastatic breast cancer (MBC) based on progression-free and overall survival benefits documented versus standard chemotherapy in the ASCENT study. Nonetheless, neutropenia and treatment delays remain a key challenge in routine clinical practice. A previous audit conducted at The Royal Marsden (RM) documented high rates of neutropenia (any grade: 71.8%; grade ≥3: 20.5%; febrile neutropenia: 10.3%) with no primary granulocyte colony-stimulating factor (GCSF) prophylaxis. This prompted the implementation of primary GCSF for patients receiving SG at RM.

Objectives: (i) determine the real-world incidence and CTCAE grade of neutropenia in patients receiving SG with primary GCSF prophylaxis; (ii) describe clinically relevant sequelae of neutropenia, including treatment delays, discontinuations and hospitalisations in this cohort.

We retrospectively analysed outcomes for adults with MBC receiving SG at RM between December 2024 and September 2025. Inclusion criteria included receipt of ≥1 SG dose during the study period outside a clinical trial. All patients received primary GCSF prophylaxis (filgrastim) on days 3–5 and 11–13 each cycle as per Trust protocol. Demographics, laboratory results and outcomes were extracted from electronic records. The primary endpoint was incidence of neutropenia by CTCAE grade. Secondary endpoints were febrile neutropenia, treatment delays, discontinuation due to neutropenia and neutropenia-related hospitalisation. Descriptive statistics were used.

Twenty-four patients were included in the analysis, all of whom received primary GCSF prophylaxis. Overall, 3/24 (12.5%) experienced neutropenia of any grade. Of these, two patients developed grade 1 neutropenia and continued SG without delays. One patient developed grade 2 neutropenia resulting in a single two-week treatment delay. There were no cases of grade 3–4 neutropenia and no episodes of febrile neutropenia. No patient discontinued SG or required hospitalisation due to neutropenia.

We describe the real-world safety of SG in a cohort of patients receiving SG with primary prophylaxis in a large Breast Unit in England. While in the ASCENT study, neutropenia of any grade occurred in 63% and grade ≥3 neutropenia in 51%, with febrile neutropenia in 6%, in our cohort primary GCSF reduced the rate of any-grade neutropenia to 12.5% with no grade ≥3 or febrile neutropenia. Our results add to those from the phase 2 PRIMED study of prophylactic GCSF given for 2 days after days 1 and 8 in which neutropenia of any grade was reported in 28% (20% grade 3-4) with no cases of febrile neutropenia. Importantly, our analysis documented not only reduced haematological toxicity, but also minimal treatment interruption rates, no treatment discontinuations and hospitalisations attributable to neutropenia. Although our analysis is limited by its retrospective design, modest sample size and short follow-up, these findings support the use of primary GCSF with SG in routine UK practice.

Implementing primary prophylactic filgrastim on days 3–5 and 11–13 with SG for MBC was associated with a substantial reduction in neutropenia incidence and severity, elimination of febrile neutropenia, and negligible treatment modifications or healthcare resource utilisation. Given the high baseline risk of neutropenia, these real-world data support adopting primary GCSF prophylaxis as standard practice.

References

1. Bardia A, Hurvitz SA, Tolaney SM, Loirat D, Punie K, Oliveira M, et al. Sacituzumab Govitecan in

Metastatic Triple-Negative Breast Cancer. N Engl J Med. 2021;384(16):1529–41. doi:10.1056/NEJMoa2028485
2. Rugo HS, Bardia A, Tolaney SM, Cortés J, Kalinsky K, Loibl S, et al. Sacituzumab govitecan versus treatment of physician's choice in previously treated hormone receptor-positive, HER2-negative metastatic breast cancer (TROPiCS-02): a randomised, open-label, phase 3 trial. Lancet. 2023;402(10404):1093–106. doi:10.1016/S0140-6736(23)01245-X
3. Crewe E, Gill I, Montes Gonzalez J, Cano Gil D, McGrath S, Ring A, Johnston S, Okines AFC, Battisti NML. Abstract P2-08-11: Real-world safety of sacituzumab govitecan in patients with advanced triple receptor-negative breast cancer in a tertiary centre in the United Kingdom [abstract]. In: Proceedings of the San Antonio Breast Cancer Symposium 2024; 2024 Dec 10-13; San Antonio, TX. Philadelphia (PA): AACR; Clin Cancer Res. 2025;31(12 Suppl):P2-08-11. doi:10.1158/1557-3265.SABCS24-P2-08-11.
4. Pérez-García JM, Gion M, Ruiz-Borrego M, Blancas I, López-Miranda E, Blanch S, et al. Prevention of sacituzumab govitecan-related neutropenia and diarrhea in patients with HER2-negative advanced breast cancer (PRIMED): an open-label, single-arm, phase 2 trial. EClinicalMedicine. 2025;85:103309. doi:10.1016/j.eclinm.2025.103309.

Category: Service Evaluation

ID - Country: 13971 - United Kingdom

Redefining Patient Access in Clinical Trials: Extending Self-Administration Pathways from Standard Care

Ruvimbo Madoroba[1] and Hashim Kabash[1]
[1]The Royal Marsden NHS Foundation Trust

Introduction and Aims/Objectives: Subcutaneous (SC) self-administration of anti-cancer therapies such as azacitidine and bortezomib is established in standard-of-care (SOC) pathways and supports the NHS Long Term Plan for more community-based care. Clinical trial (CT) participants are typically excluded from this model. This service evaluation aimed to assess feasibility, stakeholder readiness, and operational adaptations to extend SOC self-administration pathways to CTs, enhancing patient access, efficiency, and sponsor-aligned delivery.

Study Design/Methods: Between September and October 2025, stakeholder consultation, workflow mapping, and a structured survey were conducted. Participants included CT pharmacists, aseptics and SACT Distribution Unit (SDU) staff, and haematology-oncology clinical nurse specialists (CNS). The SOC pathway was adapted for CTs using shared spreadsheets and Teams channels to coordinate patient tracking, batching, and advance ordering. A 13-response online survey assessed understanding, confidence, and training needs. Engagement with the EPIC digital health record enabled tagging of all self-admin CTs for automated visibility within pharmacy and SDU screening reports.

Results/Outcomes: Respondents comprised SDU/Aseptic Unit leads (53.8%), CT pharmacists (23.1%), and CNS staff (23.1%). Only 30.8% reported good SOP understanding, and 46.2% felt slightly or not confident supporting implementation. Key training gaps were SOP content (84.6%), documentation (61.5%), and patient counselling (61.5%). Despite this, 84.6% agreed that self-administration would improve patient care, and all agreed it would reduce outpatient workload. Challenges identified included cold-chain logistics, aseptic capacity, communication gaps, and unclear role ownership. A pilot digital self-admin patient list and CT-specific flowchart were developed, and EPIC tagging was implemented to enhance workflow automation. Sponsors supported validated cooler bags to ensure safe home storage.

Discussion: Stakeholders strongly supported expanding self-administration into CTs, reflecting patient-centred benefits and alignment with sponsor expectations. Evidence indicates SC administration reduces patient chair time by 53–120 minutes per cycle and HCP time by over 40% (1). UK time-and-motion data show SC trastuzumab costs £31.99 per injection versus £132.05 for IV, saving approximately £111.81 per injection (around £2,012 per 18-cycle course) (2). Swedish data indicate transitioning to SC trastuzumab saved >1,100 nurse hours and €603,000 in direct costs annually (3). These efficiency and safety gains underscore the operational and strategic value of extending SOC self-administration to CTs. Integration into EPIC supports scalability and robustness for future studies, meeting sponsor and regulatory expectations.

Conclusion and Implications: Extending SOC self-administration to CTs is feasible, safe, and operationally advantageous. When underpinned by structured governance, digital infrastructure, and multidisciplinary collaboration, this model enhances patient access, reduces clinical burden, and aligns with sponsor priorities for streamlined, patient-centric trial delivery. Ongoing pilot evaluation will refine SOP integration and inform sustainable expansion across future trials.

References

1. Windrum P, et al. Subcutaneous versus intravenous trastuzumab: systematic review and impact on healthcare resources. BMC Health Serv Res. 2020;20:134.
2. UK Time-and-Motion Study: Costs and Resource Use of SC vs IV Trastuzumab. SCIRP Files; 2019.
3. Jönsson B, et al. Economic impact of subcutaneous trastuzumab: Swedish multicentre analysis. PMC; 2018.

Category: Service Evaluation

ID - Country: 14265 - Brazil

Role of Clinical Pharmacy in Monitoring Cumulative Anthracycline Doses: Impact on Cardiotoxicity Prevention

Letícia Carvalho[1] and Danilo Ponciano[1]
[1]Hospital Sírio Libanês

Introduction: Anthracycline-induced cardiotoxicity represents a potentially complication of cancer treatment, particularly among patients with cumulative exposure. The reduction in left ventricular ejection fraction associated with chemotherapy can compromise treatment continuity, making early surveillance strategies essential.

Objective: To describe the role of clinical pharmacy in monitoring cumulative anthracycline doses during the verification and release of oncology prescriptions, with an emphasis on cardiotoxicity prevention.

Methods: This was a retrospective observational study conducted at a high-complexity oncology hospital, including adult cancer patients who received doxorubicin between January 2023 and January 2025. For each patient, the cumulative anthracycline dose was calculated in mg/m^2. A clinical alert threshold was set at 350 mg/m^2 and the maximum dose limit at 450 mg/m^2, according to the Brazilian Cardio-Oncology Guidelines. Upon reaching these thresholds, pharmacists intervened by notifying the prescribing physician and recommending cardioprotective strategies. Aggregated institutional data were used, exempt from Research Ethics Committee approval under CNS Resolution No. 510/2016, Article 1, Item III.

Results: A total of 209 patients receiving doxorubicin were evaluated. In 5 cases (2.4%), the alert threshold ($\geq$ 350 mg/m^2) was exceeded, prompting pharmaceutical interventions. In all cases (100% acceptance rate), cardioprotective measures were implemented, particularly the introduction of dexrazoxane, due to proximity to or exceeding of the defined cumulative dose limit.

Conclusion: Structured clinical-pharmaceutical monitoring of cumulative anthracycline doses enables early identification of patients at risk of cardiotoxicity and supports safe, multidisciplinary interventions aligned with treatment continuity. The clinical pharmacist's role proved essential for the incorporation of cardioprotective strategies and the prevention of serious adverse events in oncology.

Category: Service Evaluation

ID - Country: 13569 - United Kingdom

Service Evaluation Evaluating the impact of the updated hypersensitivity reaction guideline on the success rate of re-challenges following HSR events at The Royal Marsden NHS Foundation Trust

Trisha Patel[1], Shabnam Sobhdam[2], Ifunanya Okoye[2], Caroline Fong[2] and Faisal Rehman[2]
[1]Royal Marsden NHS Foundation Trust
[2]The Royal Marsden NHS Foundation Trust

Introduction: Chemotherapy can cause hypersensitivity reactions (HSRs), which may lead to early treatment discontinuation and affect patient outcomes. These reactions are notably common with drugs like taxanes and platinum-based agents. The Royal Marsden NHS Foundation Trust's Gynaecology Unit raised concerns about the effectiveness of recently updated HSR management guidelines, following failed re-challenges. Consequently, a service evaluation was conducted to compare the updated and previous guidelines, focusing on commonly used chemotherapy agents in gynaecology.

Aim: To evaluate the effectiveness of the new infusion-related reaction management guideline versus the prior version for common gynaecology treatments; carboplatin, liposomal doxorubicin (Caelyx), and paclitaxel.

Objectives:

1. Identify all HSR incidents from 3rd January 2024 to 3rd January 2025, split into two 6-month periods.
2. Determine which incidents were managed according to HSR trust guidelines.
3. Compare success rates of the subsequent chemotherapy cycle following adherence to the respective HSR guidelines.

Methods: A one-year retrospective study (Jan 3, 2024–Jan 3, 2025) evaluated the impact of the new hypersensitivity guideline on tolerance to subsequent cycles of carboplatin, paclitaxel, and liposomal doxorubicin. Datix incident reports from two 6-month periods before and

after the new guideline implementation were analysed to compare HSR frequency, severity, and management.

Results: Initially, 67 and 94 Datix incidences were identified in the 6 months before and after the new HSR guideline respectively. After excluding duplicates and non-HSR relevant cases, 54 pre- and 79 postupdated guideline incidents remained. Of these, 26 (48.1%) pre- and 32 (40.5%) post-updated guideline cases were from the gynaecology unit.

Under the previous guideline, 44.4% (24) HSRs were managed accurately, with 79.1% (19) tolerating further cycles—including all 12 gynaecology patients. 5 patients did not tolerate rechallenge (4 paclitaxel, 1 carboplatin). Among 16 inaccurately managed cases, 5 adopted the new guideline prerollout—2 tolerated rechallenge, 3 did not. 14 cases switched or discontinued treatment before rechallenge.

Of 34 HSR cases managed under the new guideline, 79.4% (27) tolerated subsequent cycles. In the gynaecology subgroup (16 cases), 75% (12) tolerated rechallenge; 1 paclitaxel patient couldn't tolerate the maximum rate, and the other 3 resulted in re-reactions requiring a switch to Abraxane. All intolerances involved paclitaxel.

Discussion / conclusions: The rechallenge success rate under the new guideline suggests no improvement in management of HSRs compared to the previous guideline. Notably, an additional 5 patients followed the new guideline pre-rollout, with 40% (2) tolerating rechallenge. This suggests that the new guideline remains effective, but neither guideline managed to achieve a 100% success rate. However, success within the gynaecology unit dropped from 100% to 75%, raising concerns about the new protocol, reflecting one third (4) of patients who failed rechallenge.

All failed desensitisations under the new guideline involved paclitaxel, while failures under the previous one included both paclitaxel and carboplatin. No failed rechallenges were reported for liposomal doxorubicin under either protocol, suggesting safe rechallenge with proper desensitisation.

Data limitations, particularly incomplete documentation of home pre-medications may have underestimated the new guideline's effectiveness.

References

Boulanger, J., Boursiquot, J.N., Cournoyer, G., Lemieux, J., Masse, M.S., Almanric, K. and Guay, M.P. (2014). Management of Hypersensitivity to Platinum- and Taxane-Based Chemotherapy: cepo Review and Clinical Recommendations. Current Oncology, [online] 21(4), pp.630–641. doi:https://doi.org/10.3747/co.21.1966.

Category: Service Evaluation

ID - Country: 13960 - Tunisia

Simulation of Chemotherapy Preparation Errors and Analysis of Their Criticality

Imen Guiza[1], Khadija Ben chaabane[1], Raafa Ben Saada[1], Myriam Iraqui[1], Isleme Ben regaya[1] and Mohammed Ali Youssfi[1]

[1]Main Military Hospital instruction of Tunis

Introduction: The error chamber is an educational tool that reproduces a real preparation environment in which deliberate errors are introduced and must be identified by participants. This approach aims to strengthen staff vigilance and error-detection skills. The objective of this study was to assess the ability of the staff of the centralized cytotoxic preparation unit (UPCC) to identify intentionally introduced errors in manufacturing records, analyze their criticality, and propose targeted training actions for the most critical ones.

Methodology: A total of 20 manufacturing records containing intentionally introduced errors were developed following a brainstorming session involving three pharmacists specialized in pharmacotechnics. Each error was assigned a severity (S) and detectability (D) score, allowing calculation of a criticality index ($CI = S \times D$). The sheets were then distributed to the UPCC staff, who were asked to identify the errors.

Results: On average, staff detected 12 out of 20 errors. The most frequently identified errors were those classified as highly detectable or detectable, mainly concerning storage conditions, dilution solvents, and concentration stability. Less apparent errors, classified as poorly detectable or non-detectable, were identified less frequently, with an overall non-detection rate of 40%.

Criticality analysis of the undetected errors revealed three levels of criticality: three undetected errors were of high criticality, including the reconstitution of unstable drugs (melphalan), exceeding maximum doses of vincristine, and non-compliant dilutions according to the SPC (pegaspargase). Three errors were of intermediate criticality, while two were of low criticality, related to final volume discrepancies.

Conclusion: The error chamber experiment provided a realistic evaluation of staff performance in detecting errors within manufacturing records. Low-criticality

errors underline the need for reinforced daily monitoring, whereas intermediate- and high-criticality errors highlight the necessity for targeted training programs to enhance preparation safety within the UPCC.

Category: Service Evaluation

ID - Country: 12483 - Qatar

Standardizing Pharmacy Practice for Tablet Crushing in Enteral Feeding: A Baseline Review to Improve Medication Safety and Administration

Dima Daghstani[1], Taghrid Abu Hassan[2], Arwa Nasser[2], Dr. Anas Hamad[2], fatima ismail[2], Amir Nounou[2], maram alali[2] and mohamed alamleh[2]

[1]qatar national center of cancer and research

[2]Hamad medical corporation - National Center for Cancer Care and Research - Doha, Qatar.

Background: crushing tablets is a common practice in patients with swallowing difficulties and those receiving enteral nutrition. The frequent use of oral chemotherapy and supportive medications keep cancer patient in need of crushing tablets However, inappropriate practice can lead to loss of efficacy, toxicity, or tube obstruction. Despite this risk, no standardized guideline currently exists in Qatar. This project, led by the pharmacy department at NCCCR, aims to establish a unified practice to enhance patient safety.

Objective: To establish baseline data on current prescribing and administration trends of crushed oral medications and to develop a pharmacist-led guideline for safe medication use via Nasopharyngeal/Gastric -tube.

Methods: A retrospective 6-month review of labeled Nasopharyngeal/Gastric -tube medication orders was conducted. Additionally, 418 oral medications in the pharmacy formulary were evaluated for suitability of crushing based on pharmacologic data, formulation type, and alternative availability. Trusted references such as Lexicomp and international enteral feeding guidelines were used.

Results: Out of 764 NG/G-tube medication orders, 76 (10%) were found to be inappropriate prescriptions for non-crushable medications. The remaining 688 (90%) were for crushable drugs.

Among the 418 formulary items reviewed:

–188 (45%) were safe to crush

–230 (55%) were not suitable for crushing

Among the non-crushable medications:

–128 (56%) had appropriate alternatives

–102 (44%) lacked suitable alternatives and require individualized clinical assessment

Conclusion: Baseline results show that 1 in 10 prescriptions involve inappropriate selection for crushed administration. Over half the formulary includes medications unsuitable for crushing. These findings underline the urgent need for a standardized, multidisciplinary protocol. Future steps include guideline dissemination, Cerner integration, staff education, and patient safety monitoring to reduce errors in oncology settings.

References

White R, Bradnam V. Handbook of Drug Administration via Enteral Feeding Tubes.3rd ed. London, UK: Pharmaceutical Press; 2015.

Lexi-Drugs Online Database.UpToDate. Accessed March 2025. Available from: https://online.lexi.com

Colchester Hospital University NHS Foundation Trust. Guidelines for Tablet Crushing in Patients with Swallowing Difficulties.Colchester, UK: NHS; 2018. Accessed March 2025.

Category: Service Evaluation

ID - Country: 13901 - Pakistan

Sustainability Assessment of Paclitaxel Vial Utilization: Evaluating Carbon Footprint and Financial Cost in an Oncology Pharmacy Setting

Omniya Saleem[1], Adeel Siddiqui[1], Omar Akhlaq Bhutta[1] and Saba Mazhar[1]

[1]Shaukat Khanum Memorial Cancer Hospital & Research Centre

Introduction and Aims/Objectives: Climate change is one of the most pressing challenges of the 21st century, and the healthcare sector contributes approximately 4.4% of global carbon emissions (1), with pharmaceuticals being a major source. Drug waste imposes significant financial and environmental costs, not only due to the high value of discarded medications but also because of the carbon emissions associated with their disposal. This study aimed to evaluate the economic and environmental impact of different paclitaxel vial strengths to identify strategies for sustainable oncology pharmacy practice.

Study Design/Methods: A retrospective observational study was conducted at Shaukat Khanum Memorial

Cancer Hospital and Research Centre, Lahore, Pakistan, covering January to December 2024. Cumulative paclitaxel consumption was calculated from dispensing and waste records, and the average monthly requirement was derived. For each vial strength (30 mg, 100 mg, 150 mg, 260 mg, and 300 mg), we estimated the number of vials required to meet the monthly average if exclusively used, the associated cost based on per-vial pricing. Carbon emissions were calculated based on glass weight per vial, converted to CO_2 equivalents using an emission factor of 1.437 kg CO_2e per kg of waste, which represents the average emission intensity of glass products (cradle-to-gate) (2). The study was reviewed and exempted by the Institutional Review Board.

Results/Outcomes: During the study period, a total of 10,401 paclitaxel vials of various strengths were utilized, corresponding to a cumulative dose of 2,512,020 mg and an estimated average monthly requirement of approximately 209,335 mg. Breakdown by vial strength showed that 30 mg vials accounted for the highest consumption (6,978 vials), cost PKR 36.89 million (~ $ 131,000), and produced 150 kg CO_2e emissions, per month. In comparison, 100 mg vials cost PKR 35.94 million (~ $ 128,000) with 89 kg CO_2e emissions, 150 mg vials cost PKR 32.49 million(~ $ 116,000) with 76 kg CO_2e emissions, 260 mg vials cost PKR 26.57 million (~ $ 95,000) with 63 kg CO_2e emissions, and 300 mg vials cost PKR 27.07 million (~ $ 96,000) with 56 kg CO_2e emissions. Larger vial sizes demonstrated superior sustainability, reducing both cost and emissions per milligram delivered compared to smaller vials.

Discussion of results/outcomes: These findings underscore the potential of optimizing vial selection, and implementing vial-conservation strategies to minimize financial and environmental waste. While studies from high-income countries report significant carbon emissions from cytotoxic preparations (3), the environmental impact of cancer care in low-resource settings remains underexplored. Similarly, opportunities to improve sustainability in oncology care have been highlighted in breast cancer treatment pathways (4). Our study emphasizes the critical role of pharmacists in advancing sustainable oncology care through evidence-based procurement and compounding practices.

References

1. Gkouliaveras V, Kalogiannidis S, Kalfas D, Kontsas S. Effects of Climate Change on Health and Health Systems: A Systematic Review of Preparedness, Resilience, and Challenges. International journal of environmental research and public health. 2025 Feb 6;22(2):232.
2. Climatiq. Emission Factor: Glass – General – per kg | Materials and Manufacturing | Glass Products [Internet]. Global: Circular Ecology; 2019 [cited 2025 Oct 30]. Available from: https://www.climatiq.io/data/emission-factor/9ab3d163-4759-480a-b181-0aa84d994fc1
3. Chabane M, Fagnoni-Legat C, Hosotte C, Jehl-Rave M, Barbier G, Bonnot-Perrin S, Sadeghipour F, Carrez L, Limat S, Kroemer M. Carbon footprint of a chemotherapy production unit within a hospital pharmacy: Time for green pharmacy. Journal of Oncology Pharmacy Practice. 2025 Feb 24:10781552251318313.
4. Mac A, Fontebasso A, Lam C, Tang J, Howard E, Reel E, Englesakis M, Cil TD. Opportunities to improve the environmental sustainability of breast cancer care: A scoping review. The Breast. 2025 Sep 29:104593.

Category: Service Evaluation

ID - Country: 13980 - Brazil

Value Generation and Environmental Impact Minimization Through Reduction of Chemical Waste Disposal in the Oncology Pharmacy

Letícia Carvalho[1], Michelly Venceslau Vendramini Simoes[1] and Patricia Ribeiro Fatureto Gavioli[1]
[1]Hospital Sírio Libanês

Introduction and Objectives: Antineoplastic protocols often require individualized dosing, which leads to leftover drug volumes during compounding since commercial vial sizes rarely meet patient-specific needs. These remainders can be reused within the manufacturer's in-use stability limits or according to published stability data. When discarded, however, they must comply with ANVISA Resolution RDC No. 222/2018, which classifies such waste as hazardous chemical residues, posing risks to public health and the environment, while also generating financial and sustainability impacts on the healthcare system.

Objective: To reduce financial and environmental impact by minimizing waste and chemical residue generation from unused portions of antineoplastic drugs.

Study Design / Methods: A continuous review process was initiated in 2022 and remains ongoing, consisting of literature-based evaluation of the physicochemical and microbiological stability of antineoplastic agents, as well as the feasibility of using closed-system transfer devices (CSTDs). Leftover vials were optimized

during compounding and reintroduced into inventory as intact, traceable units, recorded in the hospital's electronic system with batch and expiry details. A comparative report was generated to assess the number of preserved vials, representing avoided waste, between two periods: August 2020–August 2021 and August 2022–August 2023. A performance indicator was established, expressed as "vials preserved per month." This project was designed as a service evaluation initiative aimed at improving the efficiency and sustainability of oncology pharmacy operations rather than testing a predefined clinical hypothesis.

Results / Outcomes: The initiative resulted in a 38% increase in vial preservation, rising from 4,510 vials (Aug/2020–Aug/2021) to 6,227 vials (Aug/2022–Aug/2023). This improvement prevented the disposal of 1,717 vials, translating into both environmental and financial benefits. The reduction in hazardous chemical waste corresponded to a cost avoidance of approximately BRL 2,994,691.66 in antineoplastic drug purchases. These outcomes demonstrate the effectiveness of structured vial reuse under validated stability and traceability criteria in reducing chemical residue generation and promoting sustainable oncology pharmacy practice.

Discussion and Conclusion: The project generated measurable value through reduced operational costs, decreased hazardous chemical waste, and improved environmental stewardship. By integrating scientific evidence on drug stability, traceability tools, and continuous monitoring, this service evaluation demonstrates that pharmacy-led waste minimization initiatives can effectively combine financial efficiency and environmental sustainability. This model can be replicated across oncology services as a benchmark for responsible and cost-effective medication management in high-complexity care settings.

References

1. Agência Nacional de Vigilância Sanitária (Brasil). Resolução RDC n° 222, de 28 de março de 2018. Dispõe sobre o gerenciamento de resíduos de serviços de saúde. Diário Oficial da União; 2018.
2. Carvalho M, Costa C, Oliveira A, et al. Management of cytotoxic drug residues in hospital pharmacies: environmental and occupational aspects. J Oncol Pharm Pract. 2022;28(8):1750-1759.
3. Sessink PJM, Connor TH, Jorgenson JA, Tyler TG. Reduction in surface contamination with antineoplastic drugs in 22 hospital pharmacies in the US following implementation of a closed-system drug transfer device. J Oncol Pharm Pract. 2019;25(1):58-65.
4. Dalton C, Schenkel B, Lheureux F, et al. Reuse of opened vials of antineoplastic agents based on extended stability data: a systematic review. Eur J Hosp Pharm. 2021;28(4):204-210.
5. International Society of Oncology Pharmacy Practitioners (ISOPP). Standards of Practice in Oncology Pharmacy. J Oncol Pharm Pract. 2022;28(2 Suppl):1-80.

Category: Service Evaluation

ID - Country: 13962 - Tunisia

Video Capsules with Simulated Errors: An Innovative Educational Tool to Reinforce Good Practices in Cytotoxic Preparation

Imen Guiza[1], Khadija Ben chaabane[1], Rahma katfaoui[1], Raafa Ben Saada[1], Myriam Iraqui[1], Isleme Ben regaya[1] and Mohammed Ali Youssfi[1]
[1]Main Military Hospital instruction of Tunis

Introduction: The development of video capsules deliberately incorporating simulated errors represents an innovative educational approach for training and continuous professional development of staff in centralized cytotoxic preparation units (UPCC). This study aimed to assess the ability of UPCC staff and trainees to detect intentionally introduced errors within instructional videos illustrating key procedures of hand hygiene and gowning at the unit level.

Methodology: A predefined list of intentional errors was integrated into three educational videos filmed within our UPCC: the first demonstrating the handwashing procedure, the second focusing on gowning in an unclassified area, and the third on gowning before entering a class C controlled atmosphere zone (ZAC C). During dedicated viewing sessions, UPCC staff and trainees were provided with standardized checklists to record the errors they identified. Collected data were subjected to descriptive analysis.

Results: The overall error detection rate was 65.1%. UPCC staff achieved a mean detection rate of 72.7%, compared to 63.6% among trainees. Errors systematically identified by all participants included omission of hydroalcoholic hand rub before entering the ZAC, wearing sterile gloves in the ZAC rather than in the SAS, and wearing untied boots. Conversely, some errors were not detected at all—such as wearing gloves without adequately covering the wrists—while others, like insufficient rinsing leaving soap residues,

were detected by only 16.7% of participants. The presence of undetected errors underscores the need for enhanced and targeted training.

Discussion: These findings demonstrate the educational value of video-based simulations as a pedagogical tool to strengthen awareness and detection of procedural deviations among UPCC personnel and trainees. Incorporating simulated errors in training materials effectively fosters critical observation skills and reinforces adherence to good preparation practices in cytotoxic compounding.

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