Saudi Journal of Medicine and Public Health

https://saudijmph.com/index.php/pub

https://doi.org/10.64483/202412333

The Precision Pipeline: Orchestrating Interprofessional Coordination from Administrative Hub to Genomic Therapeutics in Oncology

Aziz Hamoud Sari Al-Otaibi [(1)] , Abdullah Yahya H. Oagde [(2)] , Nawal Ahmed Yousef Aljarad [(3)] , Mohammed Yahya Yahya Mahzari [(4)] , Rana Hassan A Hakami [(5)] , Manahil Ayed Alshammari [(6)] , Ghadeer Naif Abdullah Alshammari [(7)] , Halah Muflih Alrashidi [(8)] , Anwar Towairsh Eid Aljameeli [(9)]

(1) Afif General Hospital, Afif, Ministry of Health, Saudi Arabia,
(2) Staff Nurse, King Fahd Central Hospital, Ministry of Health, Saudi Arabia,
(3) Dammam Medical Complex,Ministry of Health, Saudi Arabia,
(4) Ministry Of Health, Saudi Arabia,
(5) Jazan Specialist ,Ministry of Health, Saudi Arabia,
(6) Irada Mental Health Complex Hail, Ministry of Health, Saudi Arabia,
(7) Maternity and Children's Hospital, Hail,Ministry of Health, Saudi Arabia,
(8) King Fahd Hospital, Kidney Dialysis Center, Madinah, Ministry of Health, Saudi Arabia,
(9) Maternity And Children's Hospital, Ministry of Health, Saudi Arabia

Abstract

Background: The contemporary cancer care trajectory has evolved into a high-stakes "precision pipeline," a multi-phase continuum from administrative coordination to the delivery of genomically-guided therapies. This complex pathway necessitates flawless handoffs between diverse professionals, yet systemic fragmentation often undermines safety, timeliness, and therapeutic integrity.

Aim: This narrative review synthesizes current evidence (2010-2024) to critically map and analyze the integrated cancer care coordination pathway, examining the interdependent roles from treatment scheduling and nursing administration through genomic testing to targeted therapy management.

Methods: A comprehensive literature search was conducted across PubMed, CINAHL, and Scopus. Included studies were evaluated and synthesized thematically to identify barriers, facilitators, and outcomes associated with each segment and their coordination.

Results: Optimal pathway performance hinges on interoperable health information systems, standardized communication protocols, and role-specific expertise. Key findings underscore the efficacy of nurse navigation in reducing scheduling delays, the criticality of pre-chemotherapy nursing assessments, the turnaround time of genomic testing as a critical rate-limiting step, and the indispensable role of clinical pharmacists in optimizing targeted therapy outcomes.

Conclusion: A seamless, patient-centered oncology pipeline requires deliberate systemic integration, robust informatics, and profound interprofessional collaboration. Future models must prioritize embedded navigation, real-time data ecosystems, and pharmacist-led therapeutic management to fully realize the promise of precision medicine.

Keywords: Care Coordination, Interprofessional Collaboration, Precision Oncology, Chemotherapy Safety, Pharmacogenomics.

Introduction

The journey through cancer care has been transformed from a sequential series of clinical encounters into a sophisticated, technology-driven, and multidirectional conveyor system—a precision pipeline. This pipeline begins not in the clinic, but within the administrative engines of scheduling and logistics, propels patients through the high-risk domain of systemic therapy administration, diverts into the intricate laboratories of molecular diagnostics, and finally delivers them to the personalized realm of targeted therapeutic management (Onukwugha et al., 2016). Each phase—secretarial treatment scheduling, nursing chemotherapy administration, laboratory genomic testing, and pharmacist targeted therapy management—constitutes a critical module where efficiency, accuracy, and communication directly dictate clinical safety, psychological well-being, and ultimate oncologic outcomes. However, fractures between these modules remain pervasive, leading to deleterious treatment delays, preventable toxicities, suboptimal resource use, and profound patient distress (Rotter et al., 2010).

*Corresponding author e-mail: azalotebi@moh.gov.sa (Aziz Hamoud Sari Al-Otaibi).
Receive Date: 11 December 2024, Revise Date: 30 December 2024, Accept Date: 31 December 2024

This narrative review synthesizes contemporary literature to dissect this integrated pipeline. It explores the distinct yet deeply interdependent functions within this continuum, analyzes systemic impediments to seamless care, and highlights evidence-based models and digital enablers that foster integration. The ultimate objective is to articulate a coherent framework for an optimized, patient-centric oncology care delivery system that ensures the right therapy reaches the right patient at the right time with the right support.

The Administrative Hub

Initiation of the care pipeline is governed by administrative processes that are deceptively complex; they establish the foundational rhythm and reliability for all subsequent interventions. Efficient treatment scheduling is a high-stakes logistical calculus, balancing resource constraints (e.g., infusion chair availability, nurse-to-patient ratios), diagnostic readiness, intricate insurance pre-authorizations, and patient-specific barriers. Inefficiencies at this genesis point create immediate and compounding downstream bottlenecks. Consequently, the role of administrative staff has expanded beyond clerical tasks, demanding a nuanced understanding of clinical urgency and insurance arcana. Structured patient navigation programs, often spearheaded by oncology nurses or trained coordinators, have demonstrated formidable efficacy in streamlining this front-end process (Miller et al., 2022).

Empirical studies consistently affirm that navigation significantly reduces the interval from diagnosis to treatment initiation, decreases appointment no-show rates, and enhances patient satisfaction by mitigating the overwhelming burden of logistical coordination (Freund et al., 2014; Chan et al., 2023). For instance, the implementation of dedicated nurse navigators in breast cancer care has been associated with a reduction of up to 30% in time to first treatment (Kline et al., 2019). Furthermore, adopting advanced scheduling software deeply integrated with electronic health records (EHRs) allows for real-time resource visibility and automated patient reminder systems, which collectively reduce scheduling errors and improve clinic throughput (Wu et al., 2017). Yet, persistent disparities linked to socioeconomic factors and digital literacy can create inequitable access to these streamlined systems. Thus, the administrative and navigational interface constitutes the first critical checkpoint for equitable and efficient pipeline entry, setting the essential preconditions for safe therapeutic delivery.

Nursing Administration

The administration of systemic anticancer therapy, particularly intravenous chemotherapy, represents one of the highest-risk procedures in modern clinical care, mandating rigorous safety protocols and expert nursing stewardship. Oncology nurses operate at the vital interface where prescribed therapeutic intent is translated into direct patient care, bearing responsibility for verification, preparation, patient education, physiological surveillance, and toxicity mitigation. This process is underpinned by stringent standards, such as those from the Oncology Nursing Society and the American Society of Clinical Oncology, which mandate independent double-checks, rigorous patient identification, and multi-point verification of regimen, dose, and cycle timing (Neuss et al., 2016; Conti-Kalchik et al., 2017). The pre-administration nursing assessment is a vital safeguard for identifying patient-specific risk factors, such as organ dysfunction or comorbidities, which may necessitate preemptive dose modifications or supportive care interventions (Mamdouh Zakaria et al., 2022).

Contemporary literature increasingly emphasizes the nurse's pivotal role in managing novel and complex toxicities associated with immunotherapies and targeted agents, necessitating continuous education and competency development (Rulten et al., 2023). Moreover, nurse-led symptom management clinics and structured telephone triage systems have proven highly effective in reducing emergency department visits and unplanned hospitalizations by proactively managing treatment-related side effects like neutropenia, dehydration, and nausea (Basch et al., 2016; Boulanger et al., 2023). The integration of EHR-embedded clinical decision support (CDS) tools at the point of care, such as alerts for renal function or critical drug-drug interactions, has further augmented nursing safety practices (Rahimi et al., 2018). Ultimately, the chemotherapy nurse functions as both a technical expert and a holistic caregiver, whose coordinated actions within the broader pipeline—communicating emergent toxicities to pharmacists and physicians, adjusting follow-up based on patient tolerance—are indispensable for maintaining therapeutic continuity and safety.

The Genomic Pivot: Precision Diagnostics as a Rate-Limiting Step

The paradigm of cancer treatment has been fundamentally reshaped by comprehensive genomic profiling, which serves as the decisive therapeutic pivot point from empirical chemotherapy to biomarker-directed targeted therapy or immunotherapy. The integration of biomarker testing into the care pipeline introduces a critical diagnostic interval that directly dictates therapeutic options and timing. This phase involves a cascade of steps: appropriate test ordering, ensuring tissue sample adequacy and availability, complex laboratory analysis (involving next-generation sequencing), sophisticated bioinformatic interpretation, and the timely reporting of clinically actionable results (McNulty et al., 2019). A predominant coordination challenge identified across studies is the turnaround time (TAT) for genomic results, which frequently becomes a critical rate-limiting step, inducing

significant patient anxiety and potentially compromising outcomes when treatment is delayed (Pennell et al., 2019).

Barriers are multifaceted, encompassing pre-analytical issues (insufficient biopsy material, necessitating repeat procedures), analytical delays due to test complexity or laboratory backlogs, and post-analytical challenges in interpreting and communicating vast genomic datasets into a clinically useful report (Wahida et al., 2023). The rise of centralized molecular tumor boards (MTBs) has emerged as a best-practice solution, convening oncologists, pathologists, geneticists, bioinformaticians, and often pharmacists to collaboratively interpret results and formulate therapeutic recommendations (Seidman Sorsby et al., 2024). However, effective MTBs require a seamless data flow from the laboratory informatics system to the clinical team. Research highlights that standardized protocols for reflex testing for common biomarkers (e.g., in non-small cell lung cancer), the strategic use of liquid biopsy as a complementary tool, and clear reporting formats can optimize this segment (Singal et al., 2019). Importantly, nurses and navigators play a crucial psychosocial role in preparing patients for testing, explaining its purpose, and managing expectations during the anxious waiting period, thereby bridging the communication gap between the laboratory science and the patient experience (Reed et al., 2022). Table 1 and Figure 1 show the oncology precision pipeline, including key stages, actors, and handoff vulnerabilities

Table 1: The Oncology Precision Pipeline: Key Stages, Actors, and Handoff Vulnerabilities

Pipeline Stage	Primary Actors	Core Responsibilities & Value-Added	Critical Handoff Points & Data Needs
1. Administrative Hub & Scheduling	Patient Navigators, Schedulers, Financial Counselors	Logistics coordination, insurance authorization, patient education on process, equity facilitation.	**To Stage 2:** Scheduled list with auth status. **From Stage 3:** Genomic result to schedule MTB/follow-up.
2. Therapy Administration & Monitoring	Oncology RNs, Advanced Practitioners	Safe drug administration, pre-treatment assessment, real-time toxicity mgmt., patient advocacy.	**From Stage 1:** Patient arrival data. **To Stage 4:** Toxicity reports, adherence flags. **From Stage 3:** Genomic report for regimen validation.
3. Genomic Pivot & Diagnostic Interpretation	Pathologists, Lab Scientists, Molecular Oncologists, Genetic Counselors	Tissue/assay selection, sequencing, bioinformatic analysis, and actionable report generation.	**To Stage 2 & 4:** Timely, interpretable genomic report. **From Stage 2:** Adequate tissue sample.
4. Targeted Therapy Management & Optimization	Oncology Pharmacists, Prescribing Oncologists	Biomarker-verified dosing, DDI screening, adherence counseling, chronic toxicity mgmt., cost mitigation.	**From Stage 3:** Genomic report for therapy selection. **To Stage 2:** Patient-specific education & monitoring plans.

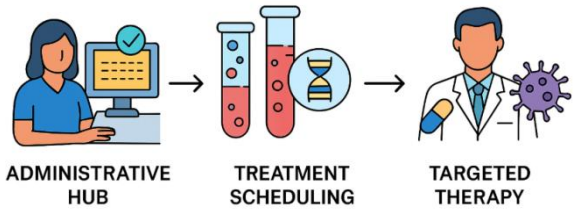

Figure 1: The Oncology Precision Pipeline

Pharmacist-Driven Management

The proliferation of oral targeted therapies and complex biologics has catalytically expanded the role of the oncology clinical pharmacist from a dispensing function to a central pillar of chronic disease management within the cancer pipeline. These agents, while more selective, are characterized by unique toxicity profiles, narrow therapeutic indices, profound drug-drug interaction (DDI) potential, and staggering financial costs (Weingart et al., 2008). Pharmacists are uniquely equipped to manage these challenges across the continuum. Their contemporary responsibilities encompass prospective medication order review with a focus on genomically-informed dosing, comprehensive DDI screening, structured patient education on adherence and self-monitoring, and longitudinal toxicity surveillance and management (e.g., rash from EGFR inhibitors, hypertension from VEGF inhibitors) (Antoniou et al., 2019).

Clinical pharmacist interventions in oncology clinics are strongly associated with significant reductions in medication errors, improved adherence rates, and decreased severity of adverse events, thereby preventing unnecessary dose reductions or therapy discontinuations (Paolella et al., 2018; Ignoffo et al., 2021). Furthermore, pharmacists are integral to mitigating financial toxicity, providing expert navigation of prior authorizations and patient assistance programs (Fiala et al., 2020). The model of pharmacist-led therapy management clinics, where patients on oral anticancer agents receive structured, protocol-driven follow-up, is accruing robust evidence for improving outcomes and safety (Song et al., 2019). This role demands deep integration with the nursing and medical teams; for example, a

pharmacist's identification of a critical DDI must be rapidly communicated to the administering nurse, and co-management of a chronic toxicity must be coordinated with the prescribing oncologist. The pharmacist thus acts as the crucial safety net and outcome optimizer, ensuring that the precision promised at the diagnostic pivot is fully and safely realized in sustainable therapeutic delivery. Figure 1 shows the interprofessional roles and data exchange in precision oncology.

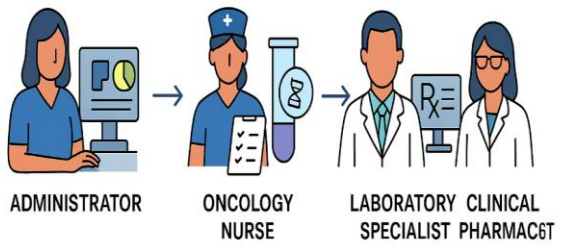

Figure 1: Interprofessional roles and data exchange in precision oncology

Interdependence and Handoffs

The most significant vulnerabilities—and opportunities—within the oncology pipeline exist at the interfaces: the handoffs between scheduling, nursing, laboratory, and pharmacy. Each handoff represents a potential point for miscommunication, data degradation, and process delay. A systems-based analysis reveals these are not mere transactional exchanges but require shared mental models and bidirectional, closed-loop communication (Tomasone et al., 2016). For instance, a scheduling delay from a prior authorization denial directly impacts nursing workflow and may necessitate re-assessment of a patient's clinical status. A bottleneck in genomic test reporting halts the pharmacist's ability to initiate patient counseling on a new targeted drug. Inadequate communication of a chemotherapy-related toxicity from nurse to pharmacist may preclude optimal supportive care prescribing. Research from high-reliability organizations underscores the importance of standardized communication tools like SBAR (Situation, Background, Assessment, Recommendation) and structured handoff protocols (Sanson-Fisher et al., 2019).

The EHR is the intended central nervous system for this coordination, yet its efficacy is frequently hampered by poor usability, lack of true interoperability between siloed modules (e.g., scheduling, lab, pharmacy systems), and rampant alert fatigue (Li et al., 2022). Integrated Practice Units (IPUs), as conceptualized by Porter and Lee (2013), offer a transformative model where dedicated, co-located teams organized around specific cancer types share common goals, performance metrics, and communication channels, thereby intrinsically streamlining handoffs. Technological solutions like shared, visual pathway dashboards that track a patient's real-time progress through each pipeline milestone (e.g., "scheduled," "pre-meds administered," "labs resulted," "therapy authorized") are emerging as powerful tools to create collective situational awareness for the entire care team (Tseng & Hicks, 2016). Ultimately, pipeline efficacy is less about individual module excellence and more about orchestrating systems that make flawless communication and coordinated action the default at every transition.

Technology and Data Integration: The Digital Central Nervous System

Digital health technologies are increasingly the indispensable central nervous system that interconnects the disparate modules of the cancer care pipeline. While the EHR is foundational, its limitations have catalyzed the development of specialized oncology-specific modules, patient portals, and interoperability standards like Fast Healthcare Interoperability Resources (FHIR) (Green et al., 2020). These technologies are designed to facilitate the seamless flow of information. For example, when a genomic test result is finalized in the laboratory information system, it can automatically populate a structured field in the EHR via an FHIR-based API, triggering a smart alert to the oncologist and pharmacist for review. Patient-reported outcome (PRO) platforms, integrated into patient portals, allow individuals to report symptoms in near real-time; these data are then algorithmically routed to the appropriate team member (e.g., severe diarrhea to the nurse, financial concerns to the navigator, medication questions to the pharmacist), enabling proactive, pre-emptive management (Stover et al., 2021).

Artificial intelligence (AI) and machine learning are beginning to assist with predictive tasks such as forecasting patient no-shows for dynamic scheduling optimization, identifying eligible patients for genomic testing based on natural language processing of clinical notes, and flagging potential adverse drug event patterns from combined clinical and pharmacy data streams (Matthew et al., 2021). However, deploying these technologies introduces new coordination challenges, including the need for extensive workflow redesign, continuous training, and dedicated technical support. Moreover, the digital divide can exacerbate existing health inequities if access and literacy are not deliberately addressed (Shulman et al., 2020). The aspirational goal is a learning health system where aggregated data from every pipeline segment—scheduling efficiency metrics, nursing administration incident reports, test TAT, pharmacist intervention logs—are continuously analyzed to identify bottlenecks, predict failures, and drive iterative quality improvement, thereby closing the loop on coordination (Nguyen et al., 2023). Table 2 summarizes the systemic barriers and evidence-based enablers across the oncology pipeline.

Saudi Journal of Medicine and Public Health

Table 2: Systemic Barriers and Evidence-Based Enablers Across the Oncology Pipeline

https://doi.org/10.64483/202412333

Pipeline Stage	Prevalent Systemic Barriers	Evidence-Based Enablers & Mitigation Strategies
Administrative Hub	Prior authorization delays, health literacy barriers, inefficient scheduling templates, and socio-economic disparities.	Embedded patient navigation; AI-powered scheduling software; standardized pre-auth protocols; financial toxicity screening.
Therapy Administration	Nursing staffing shortages, chemotherapy errors, alert fatigue from EHR CDS, and complex novel toxicities.	Independent double-checks & barcode scanning; nurse-led symptom management clinics; competency-based training on novel agents; human factors-driven EHR design.
Genomic Pivot	Long test TAT, tissue insufficiency, unclear ordering pathways, variable report interpretation.	Reflex testing protocols; liquid biopsy integration; Molecular Tumor Boards (MTBs); standardized reporting (AMP/ASCO/CAP guidelines).
Therapy Management	High drug costs/poor adherence, complex DDIs, and fragmented communication with prescribers.	Pharmacist-led oral therapy clinics; integrated DDI screening software; proactive financial counseling; structured interprofessional communication (e.g., SBAR).
Cross-Cutting	Silos between IT systems, lack of shared goals/metrics, and ineffective team communication.	Interoperable EHRs & shared dashboards; Integrated Practice Unit (IPU) model; implementation of standardized handoff protocols.

Conclusion and Future Trajectories

This review elucidates that the modern cancer care pathway is best conceptualized as a high-precision, adaptive pipeline, whose success is wholly dependent on the seamless integration of administrative, clinical, diagnostic, and pharmacological functions. No single role operates in isolation; the transformative potential of genomic science is nullified if the resulting targeted therapy is mismanaged, just as flawless scheduling is rendered irrelevant if chemotherapy administration is unsafe.

The synthesized evidence points toward several imperatives for the future evolution of this pipeline: the mandatory embedding of navigation from diagnosis through survivorship; the universal adoption of standardized communication protocols at all handoffs; the strategic investment in interoperable, intuitive health IT that reduces cognitive burden rather than amplifying it; and the full clinical integration of pharmacists as co-managers of oral and complex therapeutics. Future research must pivot toward quantifying the impact of fully realized, integrated pipeline models on definitive endpoints such as overall survival, cost-effectiveness, and equity of access. As cancer treatment increasingly assumes the characteristics of a chronic, highly personalized condition, the coordination pipeline must evolve from a series of loosely connected stations into a unified, patient-centered, and learning ecosystem. In this optimized ecosystem, every professional—from the scheduler to the pharmacist—functions as a synchronized component of an intelligent whole, ensuring the patient experiences not fragmentation and anxiety, but a coherent, safe, and expertly guided journey.

References

1. Antoniou, M., Kolamunnage-Dona, R., Wason, J., Bathia, R., Billingham, C., Bliss, J. M., ... & Jorgensen, A. L. (2019). Biomarker-guided trials: challenges in practice. *Contemporary Clinical Trials Communications*, *16*, 100493. https://doi.org/10.1016/j.conctc.2019.100493
2. Basch, E., Deal, A. M., Kris, M. G., Scher, H. I., Hudis, C. A., Sabbatini, P., ... & Schrag, D. (2016). Symptom monitoring with patient-reported outcomes during routine cancer treatment: a randomized controlled trial. *Journal of Clinical Oncology*, *34*(6), 557-565. https://doi.org/10.1200/JCO.2015.63.0830
3. Boulanger, M. C., Petrillo, L. A., & Temel, J. S. (2023). Listen to the patient: integrating patient-reported outcomes into clinical care. *JNCI: Journal of the National Cancer Institute*, *115*(12), 1451-1453. https://doi.org/10.1093/jnci/djad174
4. Chan, R. J., Milch, V. E., Crawford-Williams, F., Agbejule, O. A., Joseph, R., Johal, J., ... & Hart, N. H. (2023). Patient navigation across the cancer care continuum: an overview of systematic

*Corresponding author e-mail: azalotebi@moh.gov.sa (Aziz Hamoud Sari Al-Otaibi).

Receive Date: 11 December 2024, Revise Date: 30 December 2024, Accept Date: 31 December 2024

reviews and emerging literature. *CA: a cancer journal for clinicians*, *73*(6), 565-589. https://doi.org/10.3322/caac.21788

5. Conti-Kalchik, T., Harvey, B. E., Hendricks, C., LeFebvre, K. B., Schulmeister, L., Ann Von Gehr, M. D., & Polovich, M. (2017, January). 2016 Updated American Society of Clinical Oncology/Oncology Nursing Society Chemotherapy Administration Safety Standards, Including Standards for Pediatric Oncology. In *Oncology Nursing Forum* (Vol. 44, No. 1, p. 31). doi: 10.1188/17.ONF.31-43
6. Fennell, M. L., Prabhu Das, I., Clauser, S., Petrelli, N., & Salner, A. (2010). The organization of multidisciplinary care teams: modeling internal and external influences on cancer care quality. *Journal of the National Cancer Institute Monographs*, *2010*(40), 72-80. https://doi.org/10.1093/jncimonographs/lgq010
7. Fiala, M. A., Wildes, T. M., & Vij, R. (2020). Racial disparities in the utilization of novel agents for frontline treatment of multiple myeloma. *Clinical Lymphoma Myeloma and Leukemia*, *20*(10), 647-651. https://doi.org/10.1016/j.clml.2020.04.018
8. Freund, K. M., Battaglia, T. A., Calhoun, E., Darnell, J. S., Dudley, D. J., Fiscella, K., ... & Writing Group of the Patient Navigation Research Program. (2014). Impact of patient navigation on timely cancer care: the Patient Navigation Research Program. *Journal of the National Cancer Institute*, *106*(6), dju115. https://doi.org/10.1093/jnci/dju115
9. Green, E. D., Gunter, C., Biesecker, L. G., Di Francesco, V., Easter, C. L., Feingold, E. A., ... & Manolio, T. A. (2020). Strategic vision for improving human health at The Forefront of Genomics. *Nature*, *586*(7831), 683-692. https://doi.org/10.1038/s41586-020-2817-4
10. Ignoffo, R. J., Knapp, K. K., Seung, A., Brown, V., Hough, S., Rieband, G., ... & Urmanski, A. (2021). Trends in the delivery of care to oncology patients in the United States: emphasis on the role pharmacists on the healthcare team. *Journal of Oncology Pharmacy Practice*, *27*(1), 5-13. https://doi.org/10.1177/1078155220907674
11. Kline, R. M., Rocque, G. B., Rohan, E. A., Blackley, K. A., Cantril, C. A., Pratt-Chapman, M. L., ... & Shulman, L. N. (2019). Patient navigation in cancer: the business case to support clinical needs. *Journal of oncology practice*, *15*(11), 585-590. https://doi.org/10.1200/JOP.19.00230
12. Li, E., Clarke, J., Ashrafian, H., Darzi, A., & Neves, A. L. (2022). The impact of electronic health record interoperability on safety and quality of care in high-income countries: systematic review. *Journal of medical Internet research*, *24*(9), e38144. https://doi.org/10.2196/38144
13. Mamdouh Zakaria, M., Mohamed Alaa, S., & Mohamed Desoky, G. (2022). Oncology Nurses' Knowledge and Practices regarding Safe Administration of Intravenous Chemotherapy. *Egyptian Journal of Health Care*, *13*(1), 1218-1231. https://doi.org/10.21608/ejhc.2022.225111
14. Matthew, A., Opia, F. N., Matthew, K. A., Kumolu, A. F., & Matthew, T. F. (2021). Cancer Care Management in the COVID-19 Era: Challenges and adaptations in the global south. *Cancer*, *2*(6).
15. McNulty, S. N., Parikh, B. A., Duncavage, E. J., Heusel, J. W., & Pfeifer, J. D. (2019). Optimization of population frequency cutoffs for filtering common germline polymorphisms from tumor-only next-generation sequencing data. *The Journal of Molecular Diagnostics*, *21*(5), 903-912. https://doi.org/10.1016/j.jmoldx.2019.05.005
16. Miller, K. D., Nogueira, L., Devasia, T., Mariotto, A. B., Yabroff, K. R., Jemal, A., ... & Siegel, R. L. (2022). Cancer treatment and survivorship statistics, 2022. *CA: a cancer journal for clinicians*, *72*(5), 409-436. https://doi.org/10.3322/caac.21731
17. Neuss, M. N., Gilmore, T. R., Belderson, K. M., Billett, A. L., Conti-Kalchik, T., Harvey, B. E., ... & Polovich, M. (2016). 2016 updated American Society of Clinical Oncology/Oncology Nursing Society chemotherapy administration safety standards, including standards for pediatric oncology. *Journal of Oncology Practice*, *12*(12), 1262-1271. https://doi.org/10.1200/JOP.2016.017905
18. Nguyen, A. C., Amspoker, A. B., Karel, M., Stevenson, A., Naik, A. D., & Moye, J. (2023). The what matters most survey: A measurement evaluation of a self-reported patient values elicitation tool among cancer survivors. *Patient education and counseling*, *115*, 107899. https://doi.org/10.1016/j.pec.2023.107899
19. Onukwugha, E., Petrelli, N. J., Castro, K. M., Gardner, J. F., Jayasekera, J., Goloubeva, O., ... & Clauser, S. B. (2016). ReCAP: impact of multidisciplinary care on processes of cancer care: a multi-institutional study. *Journal of oncology practice*, *12*(2), 155-156. https://doi.org/10.1200/JOP.2015.004200

20. Paolella, G. A., Boyd, A. D., Wirth, S. M., Cuellar, S., Venepalli, N. K., & Crawford, S. Y. (2018). Adherence to oral anticancer medications: evolving interprofessional roles and pharmacist workforce considerations. *Pharmacy*, *6*(1), 23. https://doi.org/10.3390/pharmacy6010023
21. Pennell, N. A., Mutebi, A., Zhou, Z. Y., Ricculli, M. L., Tang, W., Wang, H., ... & Otterson, G. A. (2019). Economic impact of next-generation sequencing versus single-gene testing to detect genomic alterations in metastatic non–small-cell lung cancer using a decision analytic model. *JCO Precision Oncology*, *3*, 1-9. https://doi.org/10.1200/PO.18.00356
22. Porter, M. E., & Lee, T. H. (2013). The strategy that will fix health care. *Harv Bus Rev*, *91*(10), 50-70. https://hbr.org/2013/10/the-strategy-that-will-fix-health-care
23. Rahimi, R., Kazemi, A., Moghaddasi, H., Arjmandi Rafsanjani, K., & Bahoush, G. (2018). Specifications of computerized provider order entry and clinical decision support systems for cancer patients undergoing chemotherapy: a systematic review. *Chemotherapy*, *63*(3), 162-171. https://doi.org/10.1159/000489503
24. Reed, A. K., Kohn, M. J., Stayman, S., Cole, A. M., Ko, C. W., Konnick, E. Q., ... & Knerr, S. (2022). Patient navigation for hereditary colorectal cancer: design of a randomized controlled trial to determine the effectiveness of pathways to genetic counseling. *Contemporary Clinical Trials*, *116*, 106735. https://doi.org/10.1016/j.cct.2022.106735
25. Rotter, T., Kinsman, L., James, E. L., Machotta, A., Gothe, H., Willis, J., ... & Kugler, J. (2010). Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. *Cochrane database of systematic reviews*, (3). https://doi.org/10.1002/14651858.CD006632.pub2
26. Rulten, S. L., Grose, R. P., Gatz, S. A., Jones, J. L., & Cameron, A. J. (2023). The future of precision oncology. *International Journal of Molecular Sciences*, *24*(16), 12613. https://doi.org/10.3390/ijms241612613
27. Sanson-Fisher, R., Hobden, B., Watson, R., Turon, H., Carey, M., Bryant, J., & Freund, M. (2019). The new challenge for improving psychosocial cancer care: shifting to a system-based approach. *Supportive Care in Cancer*, *27*(3), 763-769. https://doi.org/10.1007/s00520-018-4568-4
28. Seidman Sorsby, A., Caballero, R., Rivera, F. E., Remolina Bonilla, Y. A., Vazquez-Narváez, K. G., Vazquez-Manjarrez, S. E., ... & Bourlon, M. T. (2024). Impact of multidisciplinary tumor boards on clinical decision making in a genitourinary oncology clinic in Mexico city. https://doi.org/10.1200/JCO.2024.42.16_suppl.e23217
29. Shulman, L. N., Sheldon, L. K., & Benz, E. J. (2020). The future of cancer care in the United States—overcoming workforce capacity limitations. *JAMA oncology*, *6*(3), 327-328. doi:10.1001/jamaoncol.2019.5358
30. Singal, G., Miller, P. G., Agarwala, V., Li, G., Kaushik, G., Backenroth, D., ... & Miller, V. A. (2019). Association of patient characteristics and tumor genomics with clinical outcomes among patients with non–small cell lung cancer using a clinicogenomic database. *Jama*, *321*(14), 1391-1399. doi:10.1001/jama.2019.3241
31. Song, A., Csik, V. P., Leader, A., & Maio, V. (2019). The Oncology Care Model: oncology's first foray away from volume and toward value-based care. *American Journal of Medical Quality*, *34*(4), 321-323. https://doi.org/10.1177/1062860618824016
32. Stover, A. M., Haverman, L., van Oers, H. A., Greenhalgh, J., Potter, C. M., & ISOQOL PROMs/PREMs in Clinical Practice Implementation Science Work Group Ahmed Sara Greenhalgh Joanne 4 Gibbons Elizabeth Haverman Lotte 3 Manalili Kimberly Potter Caroline 5 Roberts Natasha Santana Maria Stover Angela M. 1 2 van Oers Hedy 3. (2021). Using an implementation science approach to implement and evaluate patient-reported outcome measures (PROM) initiatives in routine care settings. *Quality of Life Research*, *30*(11), 3015-3033. https://doi.org/10.1007/s11136-020-02564-9
33. Tomasone, J. R., Brouwers, M. C., Vukmirovic, M., Grunfeld, E., O'Brien, M. A., Urquhart, R., ... & Fitch, M. (2016). Interventions to improve care coordination between primary healthcare and oncology care providers: a systematic review. *esmo Open*, *1*(5), e000077. https://doi.org/10.1136/esmoopen-2016-000077
34. Tseng, E. K., & Hicks, L. K. (2016). Value based care and patient-centered care: divergent or complementary?. *Current hematologic malignancy reports*, *11*(4), 303-310. https://doi.org/10.1007/s11899-016-0333-2

35. Wahida, A., Buschhorn, L., Fröhling, S., Jost, P. J., Schneeweiss, A., Lichter, P., & Kurzrock, R. (2023). The coming decade in precision oncology: six riddles. *Nature Reviews Cancer*, *23*(1), 43-54. https://doi.org/10.1038/s41568-022-00529-3
36. Weingart, S. N., Brown, E., Bach, P. B., Eng, K., Johnson, S. A., Kuzel, T. M., ... & Walters, R. S. (2008). NCCN task force report: oral chemotherapy. *Journal of the National Comprehensive Cancer Network*, *6*(S3), S-1. https://doi.org/10.6004/jnccn.2008.2003
37. Wu, F. M., Shortell, S. M., Rundall, T. G., & Bloom, J. R. (2017). The role of health information technology in advancing care management and coordination in accountable care organizations. *Health care management review*, *42*(4), 282-291. DOI: 10.1097/HMR.0000000000000123
38. Zon, R. T., & Frame, J. N. (2022). Oncology medical home: A model for value-based cancer care. *American Society of Clinical Oncology Educational Book, 42*, 1-10.