

Impact of Guideline Adherence on the Prevention of Chemotherapy-Induced Nausea and Vomiting: A Narrative Review

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ABSTRACT

Chemotherapy-Induced Nausea and Vomiting (CINV) is among the most distressing adverse effects experienced by patients receiving cancer chemotherapy. Inadequate control of CINV is still a serious clinical concern despite significant improvements in antiemetic medicine and the creation of thorough worldwide management guidelines. Organizations like the National Comprehensive Cancer Network (NCCN), American Society of Clinical Oncology (ASCO) and Multinational Association of Supportive Care in Cancer (MASCC) have developed evidence-based recommendations that offer guidance for choosing suitable antiemetic regimens. To review current evidence on adherence to international antiemetic guidelines and evaluate the impact of guideline-concordant therapy on the prevention and management of CINV. A narrative review of published literature was conducted focusing on international antiemetic guidelines, including recommendation from NCCN, ASCO and MASCC. Studies assessing adherence, practice gaps, contributing factors and strategies to improve implementation were analysed. Evidence indicates that adherence to antiemetic protocols varies significantly between therapeutic settings. Inappropriate regimen selection, inconsistent prescribing methods, and underuse of prophylaxis for delayed CINV are common deviations. Medication accessibility, institutional challenges, patient-related variables, and a lack of knowledge about revised guidelines are all factors that affect adherence. Electronic decision-support systems, institutional protocols, and clinical pharmacist involvement were found to be successful methods for increasing adherence. Enhancing patient comfort, maintaining chemotherapy adherence, and optimizing clinical results all depend on better adherence to antiemetic medication as advised by guidelines. To bridge the gap between evidence and real-world application, multidisciplinary interventions and implementation methods are required.

Keywords: Adherence, Antiemetics, Chemotherapy-induced nausea and vomiting, Emetogenic drugs, Guidelines.

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INTRODUCTION

Chemotherapy is still a vital part of cancer treatment and cancer is still one of the major causes of illness and death in the globe. Chemotherapy is frequently linked to a number of side effects that can have a significant impact on a patient's quality of life, despite the fact that it has greatly increased survival rates for many cancers. Among these side effects, chemotherapy-induced nausea and vomiting is one of the most upsetting and feared for individuals receiving cancer treatment (Hesketh, 2008).

Chemotherapy-related nausea and vomiting is not only causing physical discomfort but also have an impact on treatment compliance and psychological well-being. Severe CINV patients may experience anxiety, exhaustion and decreased appetite, all of which can seriously impact their quality of life. Uncontrolled symptoms in severe cases can result in malnutrition, electrolyte imbalances and dehydration. Moreover, inadequate management of CINV may lead to chemotherapy dose reduction, treatment postponement or discontinuation, all of which could affect therapeutic results (Bloechl *et al.*, 2006).

Effective antiemetic drugs have been developed as a result of advances in our knowledge of the neurological mechanisms behind CINV. Compared to previous treatment methods, modern antiemetic regimens improve symptom management by targeting several neurotransmitter pathways implicated in the emetic reflex. Clinical practice recommendations for antiemetic therapy have been produced by a number of professional organizations to support consistent and evidence-based management of



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CINV. These well-known organizations include the National Comprehensive Cancer Network (NCCN), the Multinational Association for Supportive Care in Cancer/European Society of Medical Oncology (ESMO) and the American Society of Clinical Oncology (ASCO) (Basch *et al.*, 2011; Roila *et al.*, 2016; Berger *et al.*, 2017). According to the emetogenic risk connected to particular chemotherapy regimens, these guidelines offer suggestions for the proper choice and combination of antiemetic medications (Poli *et al.*, 2003).

Despite the availability of these guidelines, research shows that adherence to suggested antiemetic procedures in clinical practice is frequently inadequate. There are substantial practice gaps in the management of CINV, as seen by the discrepancies between guidelines and actual prescribing practices. Improving supportive care in oncology requires identifying these gaps and understanding the obstacles to guideline implementation. The objectives of this review are to give a thorough overview of how guidelines are followed in the treatment of CINV, the variables that affect compliance, and investigate ways to enhance adherence in clinical practice.

METHODOLOGY

This narrative review was conducted to summarize available evidence on adherence to international antiemetic guidelines in the prevention and management of Chemotherapy-Induced Nausea and Vomiting (CINV).

Data Sources and Search Period

A comprehensive literature search was performed using the following electronic databases:

- PubMed/MEDLINE.
- Scopus.
- Google Scholar.

The search included articles published between January 2000 and April 2025, as major advancements in antiemetic pharmacotherapy and guideline development have occurred.

Search Strategy

A combination of Medical Subject Headings (MeSH) terms and free-text keywords was used. Boolean operators AND and OR were applied to broaden and refine the search.

Inclusion Criteria

Studies were included if they met the following criteria:

- Published in English language.
- Evaluated prevention or management of CINV.

- Assessed adherence to international antiemetic guidelines or prescribing practices.
- Observational studies, randomized controlled trials, retrospective studies, and review articles.
- Studies conducted in adult cancer patients receiving chemotherapy.

Exclusion Criteria

Studies were excluded if they:

- Were non-English publications.
- Focused on nausea and vomiting unrelated to chemotherapy.
- Included pediatric populations only.
- Were duplicate or irrelevant publications.

DISCUSSION

Pathophysiology of Chemotherapy-Induced Nausea and Vomiting

Peripheral and central nervous system pathways interact extensively in the pathogenesis of CINV. Chemotherapeutic drugs activate the brainstem's vomiting center by stimulating different neurotransmitter systems.

The release of serotonin from enterochromaffin cells in the gastrointestinal system after chemotherapy treatment is one of the main causes. The brain's chemoreceptor trigger zone and vomiting center receive signals when released serotonin attaches to serotonin type-3 receptors on vagal afferent nerve fibers (Feyer *et al.*, 2011).

Substance P, a neuropeptide that interacts with neurokinin-1 receptors in the central nervous system, is another important mediator of CINV. Delayed nausea and vomiting that occurs many days after chemotherapy is largely caused by activation of these receptors (Poli *et al.*, 2003).

The emetic reaction is also influenced by dopamine receptors found in the chemoreceptor trigger zone. The control of nausea and vomiting may also be influenced by other neurotransmitters including acetylcholine and histamine (Gupta *et al.*, 2021).

Due to the involvement of numerous neurotransmitter pathways, antiemetic combinations that targets multiple receptors is often required for the successful prevention and management of CINV.

Classification of Chemotherapy-Induced Nausea and Vomiting

Acute CINV

Acute CINV happens in the first 24 hr after treatment. It is frequently seen with highly emetogenic chemotherapeutic drugs and is mostly linked to serotonin release (Majem *et al.*, 2022).

Delayed CINV

Delayed CINV emerges between 24 and 120 hr following chemotherapy treatment. This kind may last for a few days following chemotherapy and is closely linked to neurokinin-1 receptor activation (Majem *et al.*, 2022).

Anticipatory CINV

Patients who had a prior poorly controlled nausea and vomiting during past treatment cycles are more likely to suffer anticipatory CINV, which happens prior to the injection of chemotherapy. This disorder is significantly influenced by psychological variables (Majem *et al.*, 2022).

Breakthrough CINV

The term "breakthrough CINV" describes nausea and vomiting that persist in spite of preventative antiemetic medication. Usually, more rescue drugs are needed to manage symptoms (Majem *et al.*, 2022).

Refractory CINV

Patients who develop nausea and vomiting in later chemotherapy cycles after receiving the proper preventative medication during prior rounds are said to have refractory CINV (Majem *et al.*, 2022).

Antiemetic Treatment Guidelines

Several international organizations, such as the American Society of Clinical Oncology, the Multinational Association of Supportive Care in Cancer collaborating with the European Society for Medical Oncology, and the National Comprehensive Cancer Network, have developed evidence-based antiemetic treatment guidelines.

These recommendations suggested suitable antiemetic regimens for each risk category and classified chemotherapeutic drugs based on their emetogenic potential (Basch *et al.*, 2011; Roila *et al.*, 2016; Berger *et al.*, 2017).

Highly Emetogenic Chemotherapy (HEC)

For highly emetogenic chemotherapy regimens, ASCO and NCCN guidelines recommend a combination of multiple antiemetic agents, including:

- Ondansetron or other serotonin receptor antagonists.
- Aprepitant.

- Dexamethasone.
- Olanzapine.

Moderately Emetogenic Chemotherapy (MEC)

A two-drug combination of dexamethasone and a serotonin receptor antagonist is typically advised for chemotherapy that is moderately emetogenic. An NK1 receptor antagonist may also be used in some circumstances.

Low Emetogenic Chemotherapy (LEC)

Single-agent prophylaxis, often with dexamethasone or a serotonin receptor antagonist, is typically sufficient.

Minimal Emetogenic Chemotherapy

Routine prophylactic antiemetic therapy is generally not required for chemotherapy regimens associated with minimal emetogenic risk (Table 1).

Adherence to Antiemetic Guideline

The degree to which recommended antiemetic medication complies with accepted evidence-based guidelines is known as guideline adherence. High adherence rates show that medical professionals are implementing recommended regimens into clinical practice.

Different levels of adherence to antiemetic guidelines have been documented in studies carried out in various healthcare settings. While some organizations show high levels of compliance and others reported substantial deviations from advised procedures (Nikbakht *et al.*, 2021).

Inappropriate drug combinations, improper dose schedules, failure to administer drugs for the delayed phase of CINV and omission of indicated antiemetic treatments are common examples of non-adherence. These variations may make prophylaxis less effective and raise the risk of breakthrough symptoms (Molassiotis *et al.*, 2008).

Therefore, increasing adherence to antiemetic treatment is thought to be an essential strategy for improving supportive care in oncology.

Practice Gap Analysis

Discrepancies between guidelines and actual clinical practice can be found with the aid of practice gap analysis. According to the studies, many chemotherapy patients do not receive antiemetic medication in accordance with the recommended guidelines (Kacar *et al.*, 2023).

Inadequate prevention of delayed CINV is one of the common problems. Delayed phase therapy is occasionally disregarded, even if medical professionals may recommend suitable drugs for the acute phase. Inadequate prophylaxis may also result from

medical professionals underestimating the emetogenic potential of specific chemotherapy regimens (Kacar *et al.*, 2023).

On the other hand, some patients are given antiemetic drugs that are not appropriate for their degree of emetogenic risk, which leads to unnecessary drug exposure and higher medical expenses.

Understanding these practice gaps is essential for designing interventions aimed at improving guideline adherence.

Factors Affecting Guideline Adherence

Healthcare provider factors

Adherence to antiemetic recommendations may be impacted by a number of issues that healthcare providers may encounter. These include inconsistent institutional treatment regimens, insufficient time for patient consultations and lack of awareness of the latest recommendations (Yaguchi *et al.*, 2022).

Patient-Related factors

The risk of CINV and the efficacy of antiemetic medication may be influenced by patient variables such as age, gender, motion sickness history, anxiety levels, prior chemotherapy experiences and patient adherence to prescribed drugs (Yaguchi *et al.*, 2022).

Healthcare system factors

The implementation of guidelines may also be impacted by disparities in healthcare infrastructure, budgetary limitations and restricted access to prescribed treatments (Yaguchi *et al.*, 2022).

Clinical Impact of Non-Adherence

Patients receiving chemotherapy may face serious consequences if antiemetic medication guidelines are not followed. The risk of uncontrollable nausea and vomiting is increased by inadequate prophylaxis, which can have a detrimental impact on the comfort and quality of life of patients.

Dehydration, electrolyte imbalances, exhaustion and decreased oral intake can result from uncontrolled CINV. Hospitalization or further medical procedures may be necessary to treat certain problems (Hesketh, 2008).

Furthermore, patients may be discouraged from continuing chemotherapy due to poorly managed symptoms, which could have an impact on treatment results.

Strategies to Improve Guideline Adherence

Several strategies can be implemented to enhance adherence to antiemetic guidelines (Al-Salloum *et al.*, 2021).

Education programmes

Healthcare workers' understanding and acceptance of the most recent guidelines can be enhanced through regular training programmes, workshops, demonstrations, seminars etc.

Institutional protocols

It is possible to ensure uniform prescribing practices among healthcare providers by establishing standardized antiemetic regimens based on worldwide guidelines.

Electronic decision support system

Healthcare professionals can choose the best antiemetic regimens with the use of clinical decision support tools incorporated into electronic prescribing systems.

Multidisciplinary approach

Oncologists, Pharmacists, Nurses and other healthcare professionals' collaboration can enhance supportive care procedures.

Role of Clinical Pharmacists

For patients undergoing chemotherapy, Clinical Pharmacists' role is crucial in maximizing drug therapy. Their active participation in cancer treatment can greatly enhance compliance with antiemetic recommendations (Quinn *et al.*, 2022; Fujii *et al.*, 2024).

Chemotherapy regimens, emetogenic risk levels and suitable antiemetic prophylaxis can all be assessed by pharmacists. Additionally, they can ensure proper dosage and keep monitoring out for any possible drug interactions (Fujii *et al.*, 2024).

Another important aspect of the Pharmacist's job is patient education. Giving patients guidance on how to take antiemetic drugs correctly can increase adherence and lower the chance of experiencing breakthrough symptoms (Fujii *et al.*, 2024).

Implementation of Pharmacist-Run procedures: Pharmacists create and oversee CINV management procedures, which include starting, modifying, or stopping antiemetics, especially in outpatient cancer settings (Quinn *et al.*, 2022).

Adherence to prophylactic guidelines: Depending on the emetogenicity of their chemotherapy regimen, Pharmacists make sure that patients receive the proper prophylactic antiemetics. They fill the care gaps, like the underutilization of 5-HT3 antagonists and dexamethasone during the delayed period (days 2-5) (Quinn *et al.*, 2022).

Medication reconciliation and review: Pharmacists examine patient profiles to check for drug-drug interactions, prevent overuse or underuse of antiemetics and to optimize therapy (Quinn *et al.*, 2022).

Patient Education and Counselling: In order to prevent nausea and vomiting, Clinical Pharmacists can able to inform patients about the importance of taking prophylactic drugs on a regular basis rather than only as needed (Quinn *et al.*, 2022).

Breakthrough management: As patients develop breakthrough CINV, Pharmacists actively evaluate and modify antiemetics to

Table 1: Emetogenic drugs (Basch *et al.*, 2011; Roila *et al.*, 2016; Berger *et al.*, 2017).

Emetogenicity of Chemotherapy	Intravenous drugs	Oral drugs
HEC (>90%)	Anthracycline/cyclophosphamide combination, Carboplatin, Cisplatin, Cyclophosphamide (≥ 1500 mg/m ²), Dacarbazine, Dactinomycin, Doxorubicin (≥ 60 mg/m ²), Streptozotocin.	Hexamethyl melamine, Procarbazine.
MEC (30-90%)	Aldesleukin (>12-15 million IU/m ²), Amifostine (>300 mg/m ²), Arsenic trioxide, Alentuzumab, Azacitidine, Bendamustine, Busulfan, Carboplatin (AUC<4), Clofarabine, Cyclophosphamide (<1500 mg/m ²), Cytarabine (>200 mg/m ²), Dactinomycin, Daunorubicin, Doxorubicin (<60 mg/m ²), Epirubicin (≤ 90 mg/m ²), Idarubicin, Ifosfamide (<2 g/m ² per dose), Interferon alfa (≥ 10 million IU/m ²), Irinotecan, Melphalan, Methotrexate (≥ 250 mg/m ²), Oxaliplatin, Temozolomide Thiotepa, Trabectedin.	Bosutinib, Ceritinib, Crizotinib, Cyclophosphamide, Imatinib, Temozolomide, Vinorelbine.
LEC (10-30%)	Aflibercept, Belinostat, Blinatumomab, Bortezomib, Brentuximab, Cabazitaxel, Carfilzomib, Cetuximab, Cytarabine (≤ 1000 mg/m ²), Docetaxel, Eribulin, Etoposide, 5-Fluorouracil, Ixabepilone, Methotrexate, Mitomycin, Mitoxantrone Nab-paclitaxel, Paclitaxel, Panitumumab, Pemetrexed, Pegylated liposomal doxorubicin, Pertuzumab, Topotecan, Trastuzumab-emtansine, Trastuzumab, Vinflunine.	Afatinib, Axatinib, Capecitabine, Dabrafenib Dasatinib, Everolimus, Etoposide, Fludarabine, Ibrutinib, Idelalisib, Lapatinib, Lenalidomide, Olaparib, Nilotinib, Pazopanib, Ponatinib, Regorafenib, Sunitinib, Tegafur uracil, Thalidomide, Vandetanib, Vorinostat.
Minimal (<10%)	Bevacizumab, Bleomycin, 2-Chlorodeoxyadenosine, Cladribine, Fludarabine, Nivolumab, Ofatumumab, Pembrolizumab, Pixantrone, Pralatrexate, Rituximab, Trastuzumab, Vinblastine, Vincristine, Vinorelbine.	Chlorambucil, Erlotinib, Gefitinib, Hydroxyurea, Melphalan, Methotrexate, L-phenylalanine mustard, Pomalidomide, Ruxolitinib, Sorafenib, 6-Thioguanine, Vemurafenib.

ensure appropriate medication escalation as necessary (Quinn *et al.*, 2022).

Overcoming operational barriers: In order to guarantee that patients have access to prescribed antiemetic medications, Pharmacists handle logistical issues such as prior authorizations, cost-burden reduction through financial help and language obstacles (Quinn *et al.*, 2022).

FUTURE DIRECTIONS

Future studies should concentrate on finding practical ways to enhance the use of guidelines in various healthcare environments. Studies that look at prescription trends in the real world can offer important insights into current practice (Gilmore *et al.*, 2014).

Guideline-based treatment may be made easier by developments in digital healthcare technology, such as clinical decision support tools and electronic prescribing systems (Park *et al.*, 2025).

Future symptom control may potentially be enhanced by individualized antiemetic treatment based on patient-specific risk factors (Park *et al.*, 2025).

CONCLUSION

Despite the availability of efficient antiemetic medications and thorough treatment recommendations, chemotherapy-induced nausea and vomiting continue to be a major barrier in oncology supportive care. Research indicates that antiemetic medication adherence to guidelines is still variable in clinical practice.

The review highlights how frequently deviations from suggested regimens continue to occur in various healthcare settings, including underuse of prophylaxis for delayed CINV, inadequate risk assessment, and diversity in prescribing procedures. Numerous variables, such as a lack of knowledge about new guidelines, institutional barriers, drug accessibility, and patient-related issues including adherence and symptom perception, all contribute to these practice gaps. These discrepancies may lead to increased patient suffering, higher healthcare utilization, and possibly less favourable therapeutic results.

A multifaceted and collaborative approach is needed to improve adherence to worldwide antiemetic guidelines. The integration of clinical decision-support technologies, the adoption of defined institutional protocols, ongoing professional education, and the active participation of multidisciplinary teams—especially Clinical Pharmacists—are key strategies to close the gap between evidence and practice. In particular, Clinical Pharmacists play a pivotal role in regimen modification, patient counselling, and therapy outcome monitoring, all of which greatly enhance supportive cancer care.

Future studies should concentrate on practical implementation techniques, individualized antiemetic tactics based on risk factors unique to each patient, and the use of digital health tools to complement prescribing guidelines. Ultimately, maximizing patient comfort, preserving treatment continuity, and improving overall clinical outcomes in cancer care depend on better adherence to evidence-based antiemetic protocols.

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ABBREVIATIONS

ASCO: American Society of Clinical Oncology; **CINV:** Chemotherapy-induced nausea and vomiting; **HEC:** Highly Emetogenic Chemotherapy; **LEC:** Low Emetogenic Chemotherapy; **MASCC:** Multinational Association of Supportive Care in Cancer; **NCCN:** National Comprehensive Cancer Network; **ESMO:** European Society for Medical Oncology.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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None.

AUTHOR CONTRIBUTIONS

Fasmiya Thabassum: Conceptualization of the review topic, literature search, data extraction, data synthesis, manuscript drafting and preparation of final manuscript.

Jayakrishnan S S: Study supervision, manuscript editing and final approval of the manuscript.

Keerthana K, Najiya Mahamood, Amiya N T: Assistance with literature screening, data organization, manuscript proofreading and formatting.

SUMMARY

This review highlights the gap between recommendations and actual clinical practice while summarizing the most recent research on adherence to international antiemetic guidelines for the prevention and treatment of chemotherapy-induced nausea and vomiting. The results demonstrate that patients undergoing chemotherapy frequently adhere to guidelines rather than optimum levels, which leads to poor symptom management and a lower quality of life. To enhance the application of guidelines and maximize supportive cancer care results, interdisciplinary interventions, institutional protocols and clinical pharmacist engagement must be strengthened.

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