# Retrospective Evaluation of Admissions for Chemotherapy-InducedNausea, Vomiting, and Dehydration

Katelin Van Leer PharmaD
*Lehigh Valley*, Katelin.Vanleer@lvhn.org

Janine Barnaby RPh, BCOP
*Lehigh Valley Health Network*, Janine.Barnaby@lvhn.org



## Published In/Presented At

Van Leer, K., & Barnaby, J. (2012, December). *Retrospective evaluation of admissions for chemotherapy-induced nausea, vomiting, and dehydration.* Poster presented at: The ASHP Midyear Clinical Meeting, Las Vegas, NV.

# Retrospective Evaluation of Admissions for Chemotherapy-Induced Nausea, Vomiting, and Dehydration

**Katelin Van Leer, PharmD; Janine Barnaby, RPh, BCOP**
Lehigh Valley Health Network, Allentown, Pennsylvania

## Purpose

This study will retrospectively review chemotherapy patients for admissions due to dehydration, nausea, and vomiting to evaluate Lehigh Valley Health Network's (LVHN) protocol for prevention of such admissions and emergency room (ER) visits.

This study is fundamentally descriptive. Rates of admission for chemotherapy-induced nausea and vomiting appear to be increasing at LVHN without a known cause. We anticipate a pattern of admissions to emerge which will be able to be used to guide an appropriate medical policy response to this problem.

## Background

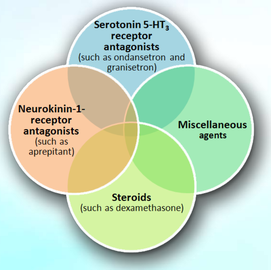
- Today, many of our patients do not experience vomiting while undergoing chemotherapy due to improved prophylaxis regimens and agents, but it is certainly still a problem.[1] The risk of chemotherapy-induced nausea and vomiting (CINV) lasts for at least 3 days after a high risk and 2 days after a moderate risk regimen's last dose of chemotherapy.[3]
- Patient characteristics that increase risk for CINV include young age, female gender, previous chemotherapy experience, previous CINV, gastrointestinal obstruction, and metastases, among many factors.[2,4,5]
- Chemotherapeutic agents are classified into categories based on their potential to induce nausea and vomiting, as illustrated in Figure 1.[2,5]

**Figure 1.** Emetogenicity Levels of Chemotherapy

| | |
|---|---|
| High emetogenic chemotherapy (HEC) | Emetic risk of 90% or more |
| Moderate emetogenic chemotherapy (MEC) | Emetic risk of 30 to 90% |
| Low emetogenic chemotherapy (LEC) | Emetic risk of 10-30% |
| Minimal emetogenic chemotherapy | Emetic risk less than 10% |

- Current antiemetic therapy is varied and often involves a combination of antiemetics to control CINV. Therapy can include medications as illustrated in Figure 2.[2]
- The choice of antiemetic should be based on the emetic risk of therapy, prior antiemetic experience, and other patient factors.[5]
- In a review of single-dose chemotherapy, CINV events did differ by emetogenicity of the regimen.[6]
  - Rates of CINV with first administration of chemotherapy ranged from 4.4% with low emetogenic chemotherapy to 13.8% with highly emetogenic chemotherapy, and have been shown to increase with subsequent chemotherapy administrations.[4]
  - Breakthrough nausea and vomiting overall has been studied to be approximately 30-40% with highly emetogenic regimens and 15-30% with moderately emetogenic regimens, so there is still a need to reduce CINV further with improved prophylaxis.

**Figure 2.** Common Chemotherapy Antiemetics




- Currently at LVHN, traditional antiemetic care is given as indicated in the National Comprehensive Cancer Network (NCCN) guidelines, however, these guidelines are very broad and may not be capturing all patients that require improved antiemetic therapy.

## Study Design

Retrospective chart review of admissions for nausea, vomiting, or dehydration in patients receiving any IV chemotherapy including ER admissions, ER discharges, and direct admissions over 1 year

## Study Population

- Inclusion Criteria:
  - Patients undergoing intravenous chemotherapy in the outpatient chemotherapy centers at LVHN
  - Patients with an ER visit to admission, ER visit to discharge, or direct hospital admission for nausea, vomiting, or dehydration within 10 days after receiving IV chemotherapy
- Exclusion Criteria:
  - Patients admitted for a reason other than nausea, vomiting, or dehydration
  - Patients with repeat admissions for nausea, vomiting, or dehydration on the same chemotherapy regimen
  - Patients receiving oral chemotherapy

## Methods

- The primary outcome of this study will be rates of admissions (number of chemotherapy admissions/number of chemotherapy administrations) compared by chemotherapeutic medication and by care plan emetogenicity.
  - Care plan emetogenicity is predefined at LVHN based on regimen medications.
- Secondary outcomes will be admission rates compared by prophylactic antiemetic and by hydration method, as well as length of stay compared by care plan emetogenicity level.
- Patient data to be collected includes:
  - Age, gender, weight
  - Presence of metastases, site of cancer, completed cycles of chemotherapy, history of CINV
  - Chemotherapy prescribing physician, location of chemotherapy treatment, chemotherapy medications and doses, regimen emetogenicity (as previously defined in the LVHN standardized care plan), pre-chemotherapy antiemetic and hydration, pre-chemotherapy antiemetic timing with regard to administration of chemotherapy (appropriate or inappropriate, where appropriate is defined as administration 30 to 60 minutes prior to chemotherapy administration), compliance with prophylactic antiemetic
  - Days between last chemotherapy dose and admission, admit reason (nausea, vomiting, dehydration), admit method (direct admission, ER to admit, or ER to discharge), day of week presenting to ER or hospital for CINV, hydration fluids, and antiemetic therapy upon admission
    - Admissions within 10 days of the last chemotherapy dose will be attributed to chemotherapy.
    - If the patient changes chemotherapeutic regimen or dosing, another admission will qualify as another documentable incidence of CINV admission due to the change.
- Through this study, we hope to evaluate the incidence of CINV in our chemotherapy patients in order to modify prophylactic treatment to reduce admissions for CINV and improve patient tolerance of chemotherapy.

## Statistical Analysis

- Primary outcomes will be reported as rate of admission for each emetogenicity level and each predefined care plan.
- Two-sided 95% confidence intervals will be computed around the admission rates. These confidence intervals will describe the range of underlying probabilities of admission for CINV that are potentially consistent with the observed admission rates.
- Admission rates will be modeled with logistic regression to assess the relationship between the likelihood of admission for CINV and the levels of the various covariates that will be collected.

## References

1. Herrstedt J. Controlling chemotherapy-related nausea and vomiting. Lancet Oncol. 2009; 10: 636.
2. Jordan K, Schmoll HJ, Aapro MS. Comparative activity of antiemetic drugs. Crit Rev Oncol Hemat. 2007; 61: 162-75.
3. NCCN Clinical Practice Guidelines in Oncology (NCCN GuidelinesTM). Version 1.2012. National Comprehensive Cancer Network. Available from NCCN.org.
4. Schwartzberg L, Szabo S, Gilmore J, Haislip S, Jackson J, Jain G, et al. Likelihood of a subsequent chemotherapy-induced nausea and vomiting (CINV) event in patients receiving low, moderately or high emetogenic chemotherapy (LEC/MEC/HEC). Current Med Res Opin. 2011; 24: 837-45.
5. ESMO minimum clinical recommendations for prophylaxis of chemotherapy-induced nausea and vomiting (NV). Ann Oncol. 2005; 16S: i77-i79.
6. Jones JM, Qin R, Bardia A, Linquist B, Wolf S, Loprinzi CL. Antiemetics for chemotherapy-induced nausea and vomiting occurring despite prophylactic antiemetic therapy. J Palliat Med. 2011; 14: 810-814.

## Disclosure

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

- Katelin Van Leer: Nothing to disclose
- Janine Barnaby: Nothing to disclose