

Chemotherapy-Induced Nausea and Vomiting

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Cancer remains a major health problem despite decreases in the overall incidence and mortality rates in the United States since the early 1990s (Greenlee, Hill-Harmon, Murray, & Thun, 2001). Improved screening techniques, early detection programs, and replacement of radical surgery with more focused surgical approaches in combination with radiotherapy, brachytherapy, biotherapy, and chemotherapy currently are available in many cancer treatment centers. The use of combination chemotherapy has contributed to a greater life expectancy and control of disease for many patients with cancer.

Nausea and vomiting (N&V) is among the most distressing side effects of chemotherapy, despite the development of more efficacious antiemetic agents (Rhodes & McDaniel, 2001). As many as 60% of patients who receive cancer chemotherapy experience some degree of N&V (King, 1997). However, the actual incidence is difficult to determine with accuracy because of the variety of drugs, doses, and health conditions of the patients who receive cancer treatments (Richardson et al., 2001). N&V is underassessed by clinicians and underreported by patients. Assumptions held by healthcare providers about the improved efficacy of newer antiemetic protocols to manage adverse side effects of chemotherapy may be a barrier to estimating the reality of patients' experiences. For example, clinicians may not be vigilant about assessing the effectiveness of an agent for each patient; they assume that because an antiemetic agent has been prescribed, N&V has been managed.

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In an analysis of 1,413 outpatients, the introduction of 5-HT₃ receptor antagonist antiemetics led to a significant reduction in the frequency of post-treatment vomiting; however, an accompanying increase in the duration of post-treatment nausea was noted (Roscoe, Morrow, Hickok, & Stern, 2000).

The purpose of this article is to examine the state of the science related to chemotherapy-induced nausea and vomiting (CINV) and to review both pharmacologic guidelines and behavioral strategies that have demonstrated efficacy in managing these distressing symptoms. The article includes an examination of the research literature that explicates the underlying physiologic, psychologic, and pharmacologic mechanisms of CINV, as well as the supporting evidence related to currently available management strategies.

Definition of Terms

Nausea, vomiting, and retching are discrete symptoms that must be defined clearly and understood to accurately assess and measure these separate experiences (Rhodes & McDaniel, 2001). **Nausea** is a subjective, un-

observable phenomenon of an unpleasant sensation experienced in the back of the throat and the epigastrium that may or may not culminate in vomiting (Rhodes & Watson, 1987). **Vomiting** is the forceful expulsion of the contents of the stomach, duodenum, or jejunum through the oral/nasal cavity (Rhodes & Watson). **Retching** is the attempt to vomit without bringing anything up (Rhodes & Watson). Rhodes (1997) encouraged clinicians and researchers to

use terms that patients readily understand because many colloquial terms such as "queasiness" and "throwing up" frequently are substituted for these words. **Anticipatory N&V** (also referred to as conditioned, learned, or psychological N&V) is a phenomenon that is linked to repeated association of chemotherapy side effects with environmental stimuli. For example, certain tastes, sensations, smells, sights, or even thoughts experienced by patients who receive chemotherapy may evoke nausea or vomiting (Morrow, 1982; Nicholas, 1982; Pickett, 1991). Duigon (1986) suggested that after repeated associations with negative side effects of cancer chemotherapy, previously neutral stimuli develop signaling properties and become conditioned stimuli that can elicit a conditioned (nausea or vomiting) response.

CINV is classified further into three phases of time surrounding chemotherapy

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