

# Effect of Concord Grape Juice on Chemotherapy-Induced Nausea and Vomiting: Results of a Pilot Study

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**T**he management of chemotherapy-induced nausea and vomiting (CINV) has improved significantly with the use of selective 5HT<sub>3</sub>-receptor antagonists, which are effective for managing acute nausea (Hesketh, 2008); the more recent addition of neurokinin-1-receptor (NK<sub>1</sub>) antagonists, which are more effective for the treatment of delayed nausea (Dando & Perry, 2004; Sanger & Andrews, 2006); and the publication of evidence-based standards of practice (Kris et al., 2006). Even with these combination drugs and the use of the American Society of Clinical Oncology's guidelines (Kris et al., 2006), uncontrolled nausea still is reported in 36% (Waqar et al., 2008) to 59% (Cohen, de Moor, Eisenberg, Ming, & Hu, 2007) of treated patients and in 75% of patients not receiving prophylactic NK<sub>1</sub> antagonist (aprepitant) therapy (Erazo Valle, Wisniewski, Figueroa Vadillo, Burke, & Martinez Corona, 2006).

The mechanisms for CINV are not fully understood, although some theories focus on the relationship between the small intestine's endocrine and enterochromaffin cells, which release serotonin (5-hydroxytryptamin [5-HT]) in response to chemotherapy-related damage to the duodenal mucosa (Saito, Takano, & Kamiya, 2003). The serotonin released from the duodenum binds to vagal afferent 5-HT<sub>3</sub> receptors, which then transmit the afferent impulses to the emetic center in the brain (Hogan & Grant, 1997). This process is responsible for early nausea and vomiting during the first 24 hours of drug administration. Delayed nausea and vomiting result from more complex responses and the combined effect of serotonin release and disrupted gut motility (Carelle et al., 2002). Cellular damage and breakdown in the stomach and small intestine also contribute to delayed nausea and vomiting (Baker, Morzorati, & Ellett, 2005).

Absorbed toxic materials circulating in the blood, including those associated with chemotherapeutic agents, also can act directly on the area postrema of the brain where the blood-brain barrier is relatively permeable

**Purpose/Objectives:** To determine the feasibility of administering a flavonoid-rich adjunctive treatment (Concord grape juice) for the management of chemotherapy-induced nausea and vomiting (CINV); to evaluate the usefulness of existing measures for assessing CINV frequency and severity, quality of life, control over life events, and psychological state; to identify any actual or potential adverse events associated with frequent grape juice intake; and to provide preliminary data concerning the effect of Concord grape juice on CINV, quality of life, perceived control over life events, and psychological state.

**Design:** Double-blind, randomized clinical trial.

**Setting:** A cancer center in an academic health science center in the northeastern United States.

**Sample:** 77 adult patients with cancer receiving moderately or highly emetogenic chemotherapy agents.

**Methods:** Participants drank 4 oz. of grape juice or placebo prior to meals for one week following each of four chemotherapy treatment cycles. They recorded frequency, duration, and distress of nausea, vomiting, and retching daily, beginning the evening of chemotherapy administration and continuing for seven days. Data were analyzed with generalized estimating equations methodology to model differences between groups over time.

**Main Research Variables:** Nausea and vomiting frequency, duration, and distress; quality of life; control over decision making; and psychological state.

**Findings:** Nausea and vomiting frequency, duration, and distress were lower for experimental group members, although a high attrition rate (50%) resulted in insufficient power to detect statistically significant differences over time. Greater levels of anxiety, depression, and hostility at baseline were related to nausea and vomiting, quality of life, and perceived control over decision making.

**Conclusions:** The effect of grape juice flavonoids on CINV should be investigated further with a larger sample to determine whether preliminary findings are supported. Alterations to the study protocol will be necessary to decrease attrition.

**Implications for Nursing:** Flavonoid-rich fruits and vegetables may provide additional protection against CINV. If the compounds work, they would offer a low-cost, readily available adjunctive treatment for the management of CINV.