

# A Meta-Analysis of the Relationship Among Impaired Taste and Treatment, Treatment Type, and Tumor Site in Head and Neck Cancer Treatment Survivors

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Since the 1980s, the incidence of base of tongue and tonsil cancers has steadily increased in the United States (Marur, D'Souza, Westra, & Forastiere, 2010; Sturgis & Cinciripini, 2007). As many as 60% of these oropharyngeal tumors are human papilloma virus (HPV)-related head and neck cancers, which tend to be diagnosed at younger ages (often before age 45) and respond better to treatment (Marur et al., 2010; Sturgis & Cinciripini, 2007). Because of this, the pool of head and neck cancer survivors will continue to grow in the foreseeable future (Siegel & Jemal, 2013). About 185,000 head and neck cancer treatment survivors (HNCTS) exist, and that number is projected to rise to more than 232,000 by 2022 (Siegel et al., 2012). In addition, advancements in treatment technique such as intensity-modulated radiation therapy (IMRT) have improved long-term survival as well as functional outcome in HNCTS. The major consequences of head and neck cancer treatment previously were impaired swallowing, impaired speech, dry mouth, dysgeusia, and taste dysfunction (Baharvand, ShoalehSaadi, Barakian, & Moghaddam, 2013; Bornbaum et al., 2012). As nerve-sparing surgery and parotid-sparing radiation techniques improve functional outcomes for many patients (Chen et al., 2013; Loewen, Boliek, Harris, Seikaly, & Rieger, 2010), taste impairment may become a more recognized problem for long-term survivors.

## Background

Head and neck cancer affects the anatomic structures from the mid-face to the neck. The organs of the head and neck work in harmony to accomplish the complex tasks involved in chewing, swallowing, breathing, and speaking. Air passes through the upper alimentary canal facilitating gas exchange with the respiratory track and allowing speech. Food in the form of liquid or solid begins the digestive process inside the mouth. The palatability and nutritional quality of food is biologically determined by sensory data that includes taste (Breslin

**Problem Identification:** To understand how taste impairment caused by head and neck cancer treatment changes over time or varies with treatment site or type.

**Literature Search:** Ovid MEDLINE® database was searched for reports of health-related quality of life (HRQOL) in head and neck cancer treatment survivors (HNCTS), which included taste function in a HRQOL instrument from 1946–2013. Eligible studies compared taste scores from baseline to post-treatment, using two treatment types or two cancer sites.

**Data Evaluation:** 247 reports were identified; 19 were suitable for meta-analysis.

**Data Analysis:** A series of dichotomous meta-analyses were conducted using comprehensive meta-analysis software.

**Presentation of Findings:** Taste scores were statistically significantly worse after treatment; the summary effect for the standard measure difference between pretreatment and post-treatment taste scores was 0.353 ( $p < 0.001$ ). Patients treated with radiation therapy (RT) reported statistically significant worse taste function post-treatment than those who received no RT; the summary effect for the standard mean differences in taste scores was 0.77 ( $p = 0.001$ ). Differences in tumor site were not significant.

**Implications for Nursing:** Taste dysfunction is a long-term complication for HNCTS, and nurses should screen survivors for this sensory dysfunction.

**Key Words:** head/neck malignancies; quality of life; radiation therapy; biostatistics; late effects of cancer treatment  
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& Spector, 2008; Coldwell et al., 2013). Because of the anatomic and physiologic characteristics of the head and neck organs, treatment for malignancy often results in the impairment of multiple actions that are vital to activities of everyday life and adequate nutrition.

Treatment for head and neck cancer may also result in a variety of long-term consequences that impair health-related quality of life (HRQOL) (Alicikus et al., 2009; Epstein & Murphy, 2010). These consequences include chronic neck and shoulder pain, mouth pain,