# Taste Dysfunction in Head and Neck Cancer Survivors

Laura McLaughlin, RN, PhD



**Purpose/Objectives:** To describe the prevalence of issues with taste function in survivors of head and neck cancer.

**Design:** Exploratory, cross-sectional.

**Setting:** Outpatients from Saint Louis University Cancer Center in Missouri.

**Sample:** 92 adult head and neck cancer survivors, heterogeneous in cancer site, treatment type, and time post-treatment, ranging from three months to more than 28 years after completion of therapy.

**Methods:** Taste discrimination was assessed using high, medium, and low concentrations of sweet, salty, sour, and bitter tasting solutions.

**Main Research Variables:** Taste, percentage of weight change, tumor site and stage, treatment type, and time since completion of therapy.

**Findings:** Eighty-five of 92 participants had some measurable taste dysfunction. Confusion between bitter and sour and the inability to discriminate among the different concentrations of the sweet solutions were common. Statistically significant weight loss was associated with dysgeusia.

**Conclusions:** Taste dysfunction was a persistent problem across all categories of head and neck cancer treatments, sites, and stages. Participants who reported the loss of one or more specific taste modality performed poorly on the taste test. However, participants could not accurately predict which taste was most severely impaired.

**Implications for Nursing:** Taste dysfunction is a long-term treatment-related side effect for head and neck cancer survivors. Assessing for taste changes and dysgeusia are important nursing considerations, as taste loss is distressing and associated with decreased appetite. Future studies are needed to identify interventions to help patients better manage and adapt to this long-term complication of cancer therapy.

**Knowledge Translation:** Flavors are recognized by taste, texture, aroma, thermal quality, and visual cues. A disruption of one or more of those sensory experiences alters flavor recognition. Having intact taste sense but impaired flavor recognition is possible. Finally, taste is not accurately self-reported because it is commonly confused with flavor recognition.

The brain uses the primary sense of taste, along with vision, hearing, touch, and smell, to interpret the physical world. Taste sensations help determine the nutritional qualities of food and prompt the secretion of enzymes and insulin for digestion (Breslin & Huang, 2006; Brisbois, Hutton, Baracos, & Wismer, 2006). Cravings and eating behaviors are driven by the desire for pleasant-tasting foods and beverages. When taste is impaired, digestion and appetite are disrupted (Breslin & Huang, 2006).

Taste receptor cells are found in the back of the throat and in the upper one-third of the esophagus, but most are located on the tongue. The anterior surface of the tongue is covered with dome-shaped projections called papillae. The sides of the papillae contain the taste buds, which are lined with taste receptor cells. Taste receptor cells are the only epithelial cells in the body that generate action potentials and use neurotransmitters, which directly transmit taste sensations to nerve fibers (Scott, 2005; Vandenbeuch & Kinnamon, 2009). Taste receptor cell proliferation is directly related to nerve supply; without adequate nerve supply, taste receptor cells die (Heckmann & Lang, 2006; Just, Pau, Witt, & Hummel, 2006).

Taste sensations begin when solid or liquid food is taken into the mouth. Every taste receptor cell is capable of recognizing all of the basic tastes: sweet, sour, salty, and bitter. When food comes in contact with receptor cells, taste sensation is transmitted to the brain and the perception of that taste sensation is directly related to the concentration of the stimuli and the number of receptor cells an individual possesses (Bartoshuk, 1989; Breslin & Huang, 2006; Smith & Margolskee, 2001).

Therapies for head and neck cancer often produce significant changes in taste, which consequently predispose patients to poor nutrition (Breslin & Huang, 2006; Hayward & Shea, 2009; Maes et al., 2002). Patients with cancer frequently report taste changes and dysgeusia, which is a persistent bitter or metallic taste sensation (Brisbois et al., 2006; Goldberg, Shea, Deems, & Doty, 2005; Hayward & Shea, 2009; Logan, Bartoshuk, Fillingim, Tomar, & Mendenhall, 2008). Alterations in taste are associated with changes in food selection, food aversions, diminished appetite, and poor quality of life among head and neck cancer survivors (Breslin &