Taste Dysfunction in Head and Neck Cancer Survivors

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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 & Huang, 2006; Hayward & Shea, 2009; Maes et al., 2002).