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# Radiation-Induced Xerostomia: How Dry Is Your Patient?

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**H**ead and neck cancers represent about 5% of the cancers diagnosed annually (Schwartz, Patrick, & Yueh, 2001) and include cancers of the oral cavity, oropharynx, nasal cavity, paranasal sinuses, nasopharynx, larynx, hypopharynx, and salivary glands. In 2003, approximately 27,000 people were diagnosed with cancers of the head and neck, and 7,200 deaths were expected to occur as a result of these diseases (Jemal et al., 2003).

Surgery and radiation therapy are the primary modalities of treatment. Most patients with head and neck cancer receive a course of radiation therapy as a component of treatment. Chemotherapy is added for advanced disease or used as a radiosensitizer.

The management of patients with head and neck cancer undergoing radiation therapy can be a unique challenge for oncology nurses, whether they work in radiation therapy or medical oncology settings. Patients with head and neck cancer often present with many symptoms, such as dysphasia, pain, and weight loss. When treatment is initiated, particularly with radiation therapy and concurrent chemotherapy, these symptoms often are magnified because of the side effects related to treatment. Oncology nurses can have a significant impact on outcomes for these patients through diligent assessment and ongoing education regarding symptom management.

## Xerostomia

Most patients receiving radiation therapy to the head and neck region will experience some type of oral complication. Xerostomia is one of the most severe symptoms experienced by patients who have received ioniz-

Most patients receiving radiation therapy to the head and neck region will experience some type of oral complication. Xerostomia is one of the most severe symptoms that patients experience and may become a lifelong problem. This article reviews normal salivary function, effects of radiation therapy on oral mucosa, impact of xerostomia on quality of life, and current treatment strategies used to manage this debilitating side effect. Oncology nurses can have a significant impact on patient outcomes through diligent assessment and ongoing education regarding symptom management.

**Key Words:** radiotherapy, xerostomia

ing radiation to the oral cavity and neck. Xerostomia is defined as dryness in the mouth from a lack of normal salivary secretion (Kusler & Rambur, 1992). Many symptoms experienced by these patients are acute and resolve with time; however, xerostomia is one that may become a lifelong problem. Xerostomia can lead to mucositis, dysphasia, dental caries, poor denture fit, oral discomfort, changes in taste perception, and increased risk of candidiasis infection. Patients' overall nutritional status can become compromised, and intake of fluids and nutrition necessary for tissue healing may be prevented. Ultimately, this cascade of events can have a profound impact on patients' quality of life (QOL).

In a QOL study, dry mouth was the most common complaint (95%) and was reported to be moderate or severe by 70% of 20 patients (Epstein, Robertson, Emerton, Phillips, & Stevenson-Moore, 2001). Harrison et al. (1997) found that xerostomia was the most common symptom reported by all 36 patients in the study, and 89% of those patients believed that it produced moderate to severe distress. This article reviews xerostomia, one of the most common side effects of radiation therapy, and the current treat-

ment strategies used to manage this debilitating side effect.

## Normal Salivary Function

The salivary glands are regulated by the nervous system. The glands respond within two to three seconds after stimulation by the sight, smell, or taste of food as the result of a conditioned reflex. About 80% of all major salivary gland tumors occur in the parotid gland (Million & Cassisi, 1984). The major salivary glands account for

70%–80% of salivary flow. The remaining flow comes from the 600–1,000 minor salivary glands that are located throughout the mouth. Large and small glands open into the oral cavity. Two parotid glands, the largest salivary glands, are located below and in front of each ear. The two submandibular glands are located in the lower jaw, and several sublingual glands are located beneath the tongue. The parotid glands are responsible for secreting saliva into the mouth through openings in the cheeks on each side opposite the upper teeth. The submandibular and sublingual glands discharge saliva upward through the openings into the floor of the mouth. Under resting conditions, the flow from the submandibular glands is at least as great as that from the parotid glands or possibly greater. The sublingual glands contribute only 2%–5% of the flow rate. Once

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