

Never-smokers fare far better than smokers after radiation therapy for head and neck cancer

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Patients with head and neck cancer who have never smoked have much better survival rates after radiation therapy than patients with a history of smoking, new research from UC Davis Cancer Center has found.

The study by Allen M. Chen and colleagues in the UC Davis radiation oncology and otolaryngology departments is among the first of its kind to examine prognosis differences based on [smoking](#) history in patients with head and neck cancer who are treated with radiation therapy.

The study, published online in *American Journal of Clinical Oncology*, found that patients with a history of smoking were more likely to die from their disease and more likely to experience a recurrence after radiation therapy than those without a smoking history.

"There is something unique about the biology of head and neck cancers among non-smokers that makes them more amenable to cure by radiation therapy," said Chen. "These tumors just melt after a few doses of radiation. If we could understand why, there would be important implications for new drugs and treatments."

Chen suspects one possible explanation for the difference in response to radiation is human papillomavirus (HPV), a sexually transmitted disease that has been highly associated with head and neck cancer in people who have never smoked.

"The most common theory is that these tumors express a characteristic viral antigen on the cell surface that makes the immune system recognize the cancers more readily, which may enhance the effects of radiation," he said. "Another theory is that patients who have never smoked and who have HPV-related tumors have fewer mutations in key genes that are critical for radiation response."

Chen compared 70 patients treated at the UC Davis Department of [Radiation Oncology](#) with newly diagnosed, non-metastatic squamous cell [carcinoma](#) of the mouth and throat who had a history of smoking with 70 patients with similar diagnoses who reported they had never smoked. Patients who continued to smoke during treatment were not included in the study. Subjects were evenly matched based on age, gender, ethnicity, primary tumor site, disease stage and treatment history.

The analysis found that 14 of the 70 never-smokers experienced a recurrence of their disease compared to 26 patients who had a history of smoking. In addition, 82 percent of never-smokers were disease-free after three years compared to 65 percent of patients who had smoked. Also, those who had never smoked had a lower incidence of complications related to treatment than those who had smoked.

Chen said the next step in the research is to identify biological or genetic differences among smokers and never-smokers diagnosed with head and neck cancers and treated with [radiation therapy](#) that might account for the differences in prognosis.

"We are in the process of conducting several laboratory experiments designed to better understand why cancers arising from never smokers are so exquisitely radiosensitive," Chen said.

Provided by University of California - Davis

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