

# Lymph node ratio may predict who lives and dies from oral cavity cancer

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Five years after diagnosis, only 40 percent of patients with locally-advanced oral cavity cancer will still be alive. The question is who is likely to live and who is likely to die? The answer to this question could not only help patients better predict the course of their disease, but could help doctors choose the most appropriate post-surgical treatments—patients at highest risk could receive the most aggressive combinations of radiation and chemotherapy.

To answer this question, researchers from University of Colorado Cancer Center gathered the information of 149 patients treated at UCHHealth University of Colorado Hospital with surgery and/or post-surgical treatments for locally-advanced oral cavity cancer between the years 2000 and 2015. In these data, they looked for patterns.

"We wanted to know if features of these patients, their tumors, or their treatment could predict survival," says first author Ding Ding, a [medical student](#) working with her research mentor, senior author Sana Karam, MD, Ph.D., investigator at CU Cancer Center and assistant professor of Radiation Oncology at the CU School of Medicine.

First, the researchers confirmed a handful of expected [risk factors](#): As seen in many previous studies, being nonwhite, uninsured or insured by Medicaid, having a larger primary tumor, having "margins" around the tumor that tested positive for cancer even after surgery, or having tumors that had already invaded surrounding tissues predicted shorter overall survival.

Another factor commonly used in models predicting [cancer risk](#) is the extent of lymph node involvement.

"The current nodal staging system for oral cavity cancer is based on the size, number, laterality, and spread of the tumor outside the wall of the involved lymph nodes," Ding says. "In other types of cancers such as [breast cancer](#), researchers have been exploring another measure of lymph node involvement, namely whether the ratio of surgically removed lymph nodes that are positive for cancer can predict treatment outcomes. We wondered if lymph node ratio, or LNR, could be a predictor of survival in oral cavity cancer, as well."

The 149 patients studied had a median 29 lymph nodes removed during surgery. About 9 percent of these lymph nodes were positive for cancer. Of course, this meant that some patients had LNR above 10 percent, while others had especially low or even zero LNR. And it turned out that patients with LNR greater than 10 percent had about 2.5 times greater risk of cancer recurrence and 2.7 times greater risk of death than patients with LNR below 10 percent. Results are published in the journal *JAMA Otolaryngology*.

"In our study, LNR appeared to be more predictive of patient outcomes than the traditional method of lymph node staging. Larger scale studies are needed to verify these findings and it might be worth exploring ways to incorporate LNR into the current model for evaluating recurrence risks," Ding says.

Patients with aggressive disease should receive more intensive chemotherapy and radiation after surgery, whereas others with less aggressive disease often forgo the full extent of these treatments. But who are these high-risk patients? The current study adds to a growing body of evidence supporting the use of LNR to identify [patients](#) at most risk for recurrence and death from locally-advanced oral cavity [cancer](#).

**More information:** Ding Ding et al, Association Between Lymph Node Ratio and Recurrence and Survival Outcomes in Patients With Oral Cavity Cancer, *JAMA Otolaryngology–Head & Neck Surgery* (2018). [DOI: 10.1001/jamaoto.2018.2974](https://doi.org/10.1001/jamaoto.2018.2974)

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