

# Machine learning can help with treatment planning and proper management of tongue cancer

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A new study from the University of Vaasa, Finland, proposes the use of machine learning techniques for effective management of tongue cancer. A predictive machine learning model produced an accuracy of 88.2% to predict if the tongue cancer would reoccur after treatment. Similarly, the machine-learning model outperformed other methods of cancer management such as the use of cancer staging and nomogram in estimating the overall survival of tongue cancer

patients. Credit: Riikka Kalmi / University of Vaasa

Imagine a technology that can predict the outcome of cancer patients—if cancer would reoccur after treatment, what kind of treatment plan would benefit the patient and the overall survival chance of the patients?

Machine learning, a subfield of artificial intelligence is poised to revolutionize cancer management. Rasheed Alabi's doctoral research at the University of Vaasa, Finland, shows [machine learning](#) techniques could assist in the proper management of tongue cancer.

Tongue cancer is the most common cancer that is found in the head and neck region. It has caused a significant amount of deaths worldwide. Apart from that, it can cause speech impairment and difficulty in swallowing and chewing.

The major challenge has been in the proper management of tongue cancer—early diagnosis, planning of treatment, and making informed decisions by the clinicians.

In his dissertation, Rasheed Alabi proposes the use of machine learning techniques for the effective management of tongue cancer. He developed a web-based tool that properly stratifies cancer patients into high-risk or low-risk groups. That helps with creating an effective treatment for tongue cancer patients.

- It is important to properly plan for the treatment of tongue cancer patients to increase the quality of care provided to them and chance of survival, says Alabi.

**Machine learning techniques outperformed the**

## **traditional methods**

The predictive machine learning model developed by Rasheed produced an accuracy of 88.2% to predict if the tongue cancer would reoccur after treatment. Similarly, the [machine-learning model](#) outperformed other methods of cancer management such as the use of cancer staging and nomogram in estimating the overall survival of tongue cancer patients.

## **Personalized medicine and precise tongue cancer management**

The proposed model is capable of alleviating the psychological, social, and economic burden caused by oral tongue cancer. The developed web-based prognostic tool ensures that each patient is considered as a separate entity (personalized medicine) to map out an effective tongue cancer management strategy. The proposed predictive model can offer personalized treatment planning, avoid unnecessary therapies, effective cancer management decision-making, realistic counseling, informed decisions, and improved overall survival. Early prediction of cancer recurrence decreases mortality rates of [tongue cancer](#) patients.

## **Concerns of machine learning in daily clinical practice**

In his dissertation, Alabi identifies several concerns that can affect the actual daily clinical use of the developed model for everyday clinical practice. These concerns are grouped into ethical challenges that are inherent to the science of machine learning and clinical implementations.

The ethical challenges include privacy and confidentiality, peer disagreement, patients' liberty to choose the preferred treatment method, shared decision making, and legal framework for smooth

implementation.

Some concerns stem from the machine learning as a technology, such as making the model explainable (explainability), understanding how the decision or prediction is made (interpretability), and enabling the developed model to work for a similar task (generalisability).

**More information:** [urn.fi/URN:ISBN:978-952-476-945-7](https://urn.fi/URN:ISBN:978-952-476-945-7)

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