



# Machine learning algorithm for early prediction of clinical deterioration events

**A novel machine learning-based predictive modeling method to predict clinical deterioration events such as (but not limited to) ICU transfer and ventilator use. This enables 'predictive triaging', i.e. being able to make triaging decisions hours to days ahead of actual deterioration of a critically ill patient. Factors impacting the deterioration are also explicated, which can be used to prevent the deterioration.**

**IP Status:** Provisional Patent Application Filed

## Applications

- Predict clinical deterioration events hours to days in advance
- Rank patients risk by predicted acuity score

## Technology Overview

Effective ICU care management, as well as resource planning in hospitals, is essential to maintaining high-quality care, especially during unexpected surges in patient demand. Researchers at the University of Minnesota, in collaboration with Allina Health, have developed a machine learning method that predicts clinical deterioration events, such as ICU transfer and mechanical ventilator use, for general ward patients hours to days in advance. By analyzing time series data of vital signs, this method provides hospitals with advance notice to prepare essential resources. This allows care providers to be able to do 'predictive triaging', i.e. making critical care decisions based on what a patient's condition is likely to be in the future. Since the predictive models also explain the factors impacting the risk score, in many cases actions can be taken to prevent the deterioration. This predictive capability also helps mitigate the strain on healthcare systems, enabling more efficient allocation of critical hospital resources.

## Phase of Development

**TRL: 4-5**

In partnership with Allina Health, the model has been tested and validated on more than 10,000 cases.

## Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

## Researchers

- [Jaideep Srivastava, PhD](#) Professor, Department of Computer Science and Engineering

## References

## Technology ID

2024-055

## Category

Software & IT/Algorithms  
Software & IT/Artificial  
Intelligence  
Software & IT/Health IT

## Learn more



1. Jiacheng Liu, Lisa Kirkland, Jaideep Srivastava(2024) , <https://arxiv.org/abs/2402.06812>, arXiv