

Analysis of a Machine Learning–Based Risk Stratification Scheme for Chronic Limb-Threatening Ischemia,
Chung J. et al. *Journal of American Medical Association Network Open*, Mar. 22, 2022 doi:10.1001

Level of Evidence: 3

Reviewer: Zaria Woods, MS-II

Peripheral arterial disease is a common manifestation that podiatrists encounter. However, if the condition becomes severe, it can progress to critical limb-threatening ischemia (CLTI). CLTI encompasses patients that have evidence of arterial insufficiency, loss of tissue (manifesting as ulcerations, wounds, or gangrene), and/ or symptoms of ischemic pain at rest.

This article retroactively analyses the data from the Project of Ex Vivo Vein Graft Engineering via Transfection (PREVENT) III clinical trial, conducted from January 1, 2001 to December 31, 2003. Supervised topic model clusters were applied to the data to create a machine learning-based risk stratification scheme for CLTI. The data from the clusters were evaluated to see the overall likelihood of a patient belonging to a cluster. This was then followed by an evaluation of the overall distribution of clusters. Three main clusters were found, and the researchers defined the primary research outcome measure as one year of Critical Limb Threatening Ischemia free survival.

To be defined as Critical Limb Threatening Ischemia free that the patient had to be in remission of CLTI symptoms (the absence of ischemic pain and/or the presence of wound healing), the ipsilateral limb not having a major amputation, and the ipsilateral limb not having CLTI a year from intervention. In addition, wound grades from the original trial were used to provide a Wifl score. Sixty percent of patients were CLTI-free at the one-year follow-up of the original cohort studies.

The study found that CLT-1 free survival is a measurement that can be accurately used as an endpoint, finding that wound and ischemia severity were not associated with the worse outcomes. Limitations to this study include:

- Methods of wound care and atherosclerotic treatment have changed since 2003, potentially altering outcomes.
- Precise data on the overall hemodynamic and infection was unavailable, limiting the ability to calculate a complete Wifl score.
- The cohort only had infrainguinal bypasses preventing further stratification of results to patients who received endovascular treatment or a form of hybrid revascularization



ACPM
American College of Podiatric Medicine
Education | Research | Advocacy