Use of Cumulative Information Estimations for Risk Assessment of Heart Failure Patients

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Abstract

As a consequence of aging population and an increasing prevalence of obesity and diabetes there are more and more patients with heart failure. This leads to a lack of professionals who can treat them and to escalating costs. An interesting solution appears to be home telemonitoring with an intelligent clinical decision support system. In this paper, the use of cumulative information estimations for risk assessment of heart failure patients with such a system is analyzed. These cumulative information estimations are utilized for creation of an algorithmic model using fuzzy decision trees that combine decision trees and notions of fuzzy logic. The algorithmic model employs mutual cumulative information and relative mutual cumulative information for association of an important piece of data about the patients with a decision node. The risk assessment with the presented solution is analyzed from the point of view of minimization of life-threatening situations and minimization of costs. Comparisons with a Bayesian network method, a nearest neighbor method, and a logistic regression method show it is a promising solution.

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