

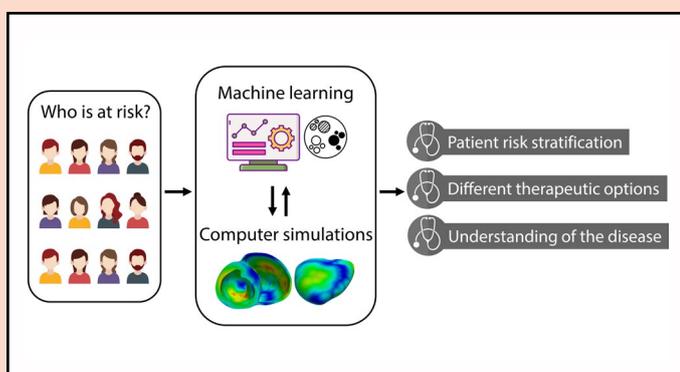
VPH SUCCESS STORY

Risk of sudden cardiac death: who and why? How computational techniques may improve patient care

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Hypertrophic cardiomyopathy (HCM) is the most common genetic heart disease. Some patients with HCM do not show symptoms, but others may die suddenly. It is therefore crucial to identify these patients at higher risk and understand why they may be more susceptible to cardiac arrest, in order to treat them better. This currently remains a challenge. In silico techniques can be successfully used for clinically-relevant applications.

By combining electrocardiogram and imaging data with machine learning and computer simulations, four distinct groups of patients in HCM with differences in risk were identified and two distinct possible mechanisms were uncovered that may explain why some patients are more at risk. This improved the understanding of the HCM disease and provided a step further towards personalized HCM treatment and management.



Combining machine learning and computer modeling can help risk stratification and mechanistic understanding in hypertrophic cardiomyopathy.

Highlights:

- Hypertrophic cardiomyopathy is a major cause of cardiac death
- Clinical problem: who is at risk?
- Approach: combine electrocardiogram and imaging with machine learning and personalized computer simulations
- Outcome: four patient groups with different risk and different mechanisms

This work is an example of how in silico medicine, and in this case the combination of machine learning and computer modeling techniques, can revolutionize the knowledge of cardiac diseases and improve treatment and care of patients. Indeed, machine learning (or data-driven) techniques are able to make sense of large and complex datasets, and can detect patterns that may be hidden to the human eye. In addition, computer simulations can simulate and predict personalized cardiac function and help understand disease mechanisms. Above all, it is the combination of these two types of techniques that will have huge impact on patient specific care and individualized treatment. **Read full paper: tinyurl.com/VPHi-success-story1**