

NEW PROCESS FOR DIAGNOSING ABNORMAL HEART RHYTHMS AUTOMATICALLY

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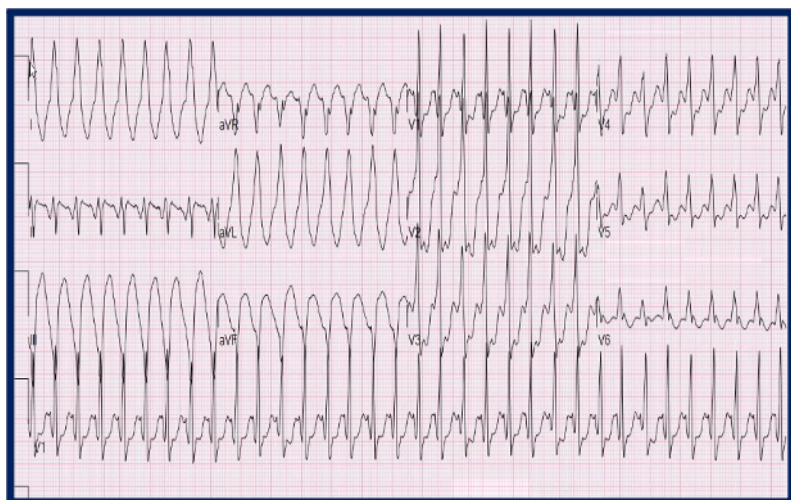
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Technology Description

Researchers at Washington University in St. Louis have developed a new method for automatically differentiating accelerated heart rhythms caused by wide complex tachycardia (WCTs) into fast, or irregularly fast heart rhythms caused by ventricular tachycardia (VT) and supraventricular wide complex tachycardia (SWCT). This method has been designed to enhance the diagnostic capability of automated electrocardiogram (ECG) interpretation by instantly transforming available ECG measurement data into novel engineered features that can be used by automated classification models to enhance accurate and automatic WCT differentiation, which can greatly improve a medical provider's ability to complete this vital task.

Non-invasive differentiation of wide QRS complex tachycardias (WCTs) into ventricular tachycardia (VT) and supraventricular wide QRS tachycardia (SWCT) by way of 12-lead electrocardiogram (ECG) interpretation is one of the most challenging and critical clinical responsibilities faced by medical providers. On the other hand, incorrect or delayed WCT differentiation, which influences inappropriate or belated clinical decisions, can lead to unfavourable patient outcomes. This invention can be used to offer estimates on the likelihood of VT or SWCT to medical providers, thus serving as cognitively meaningful clinical data to differentiate WCTs.



Above: 12-lead ECG that helps discriminate VT (usually dangerous) and SWCT (usually not dangerous) rhythms.

Stage of Research

- Fully developed method: An RCT evaluating the effectiveness of this method will happen in the near future.

Publications

Sarah LoCoco, Anthony H Kashou... Adam May. [Abstract 13915: Man vs. Machine: A Direct Comparison of the Diagnostic Efficacy of Novel Automated WCT Differentiation to Traditional Manual ECG Interpretation Approaches](#). Circulation. 2022 Oct.

Kashou AH, Evenson CM, Noseworthy PA...May AM. [Differentiating wide complex tachycardias: A historical](#) perspective. Indian Heart J. 2021 Jan-Feb;73.

Kashou, Anthony & Noseworthy...May, Adam. (2020). [Wide Complex Tachycardia Differentiation: A Reappraisal of the State of the Art](#). Journal of the American Heart Association.

Kashou AH, LoCoco S, Shaikh PA...May AM. [Computerized electrocardiogram data transformation enables effective algorithmic differentiation of wide QRS complex tachycardias](#). Ann Noninvasive Electrocardiol. 2023 Jan;28.

Applications

- Clinical diagnosis of WCT

Key Advantages

- Can be applied to any device capable of recording and analyzing the heart's electrical activity
- Enables automatic and vastly superior WCT differentiation accuracy into VT and SWCT
- Readily transforms available ECG measurement data (i.e., QRS waveform measurements) into novel engineered features that can be used by automated classification models

Patents

Patent filed

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^[PL1]If available, use PI profile(s) from <https://profiles.wustl.edu/> in addition to any reasonably up-to-date lab website