

## 149 Automated discrimination of atrial arrhythmias

- ✓ Reduces misdiagnoses of atrial fibrillation and improves therapy
- ✓ Real time analysis with high sensitivity and specificity
- ✓ Based on ventricular activation only – highly resistant to artifacts
- ✓ Effective with recordings of few seconds

### The Technology

Regular atrial tachycardia frequently results in a ventricular response with marked irregularity thereby mimicking atrial fibrillation. The reasons are complex conduction phenomena located within the atrio-ventricular (AV) node.

Based on a mathematical model of the AV node, we engineered an algorithm that automatically discriminates regular atrial tachycardia from atrial fibrillation. Only short sequences of ventricular signals are sufficient for real time discrimination with high sensitivity and specificity. As our analysis is not dependent on atrial activation (P-wave morphology), it is highly resistant to artifacts.

### Background

It is an open clinical problem to distinguish atrial flutter from atrial fibrillation. The discrimination is imperative, as atrial fibrillation is the most frequent arrhythmia for adults (~6 million individuals across Europe). On the contrary atrial flutter is under-recognized in clinical practice. Especially in cases of irregular ventricular response it is often misinterpreted as atrial fibrillation. Despite all progress, both in expert's knowledge as in sophisticated analysis tools, large numbers of misinterpretations are reported in recent literature. The reason is the non-intuitive nature of the observed arrhythmia, especially in cases of irregular ventricular response to regular atrial activation. Furthermore, both types have to be treated differently. For atrial flutter can be successfully treated in many cases by 3D-mapping guided catheter ablation.

### Advantages

- ✓ Novel diagnostic approach
- ✓ Innovative application to solve a widespread clinical problem
- ✓ Successfully tested software prototype with peer-reviewed gold standard on more than 100 patients
- ✓ Patients receive direct causal treatment

### Commercial Opportunity

- ✓ Unique selling proposition for ECG analysis technology

### Intellectual Property

Patent Application EU: EP2757940A1  
Patent Application Int.: WO2013041170A1

### Reference:

Scholz EP, Kehrlé F, Vossel S, Hess A, Zitron E, Katus HA, Sager S. *Heart Rhythm* (2014) 11:877-84.

### Contact:

technology transfer heidelberg GmbH  
Im Neuenheimer Feld 672  
69120 Heidelberg  
Tel. (+49) 6221 56-6426  
Fax. (+49) 6221 56-5714  
tt-team@med.uni-heidelberg.de

