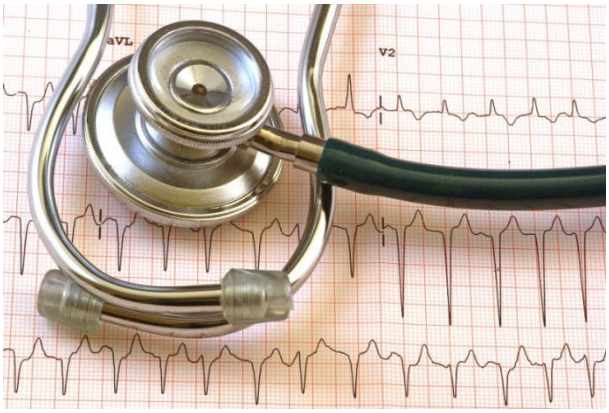
OntoCare™

MEASURING THE IMPACT OF THERAPY

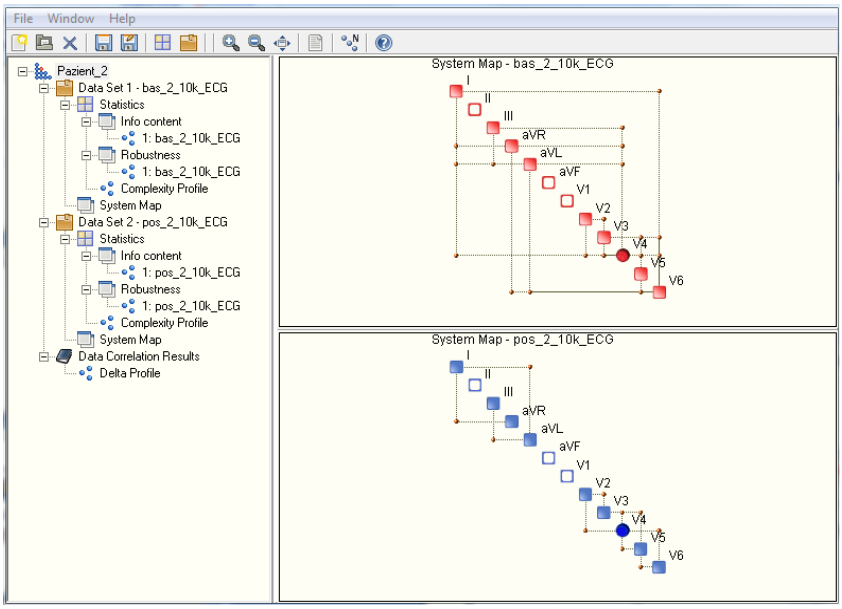
COMPLEXITY SCIENCE AT THE SERVICE OF MEDICINE



MEASURING THE IMPACT OF CRT

Cardiac Resynchronization Therapy, adopted with NYHA class III and IV status patients, has been shown to improve the symptoms of heart failure and patient's overall quality of life. CRT is generally beneficial to patients with a moderate ejection fraction (EF). CRT complexity analysis is performed using data gathered before and after the implant of a device. Typically the ECG data, in the form of tensions (mV) at each electrode, are used. The ECG is recorded over the same given period of time before implant and upon follow-up.

OntoCare™ allows us to express in quantitative terms the degree of success of the therapy based on pre and post implant ECG analysis or on the data stored in the device itself. In other words, we are able to actually measure the degree of patient response to therapy.



A HOLISTIC LOOK AT AN ECG

OntoCare™ generates the so-called Complexity Maps. These are generated *automatically* based on raw data, such ECG, EEG or any other real-time or off-line source. They reflect how information flows within a system, illustrating all the significant couplings, indicating sources of complexity and criticality. Complexity Maps (see example on the left) are fundamental towards better understanding of the dynamics of systems and of their salient characteristics.

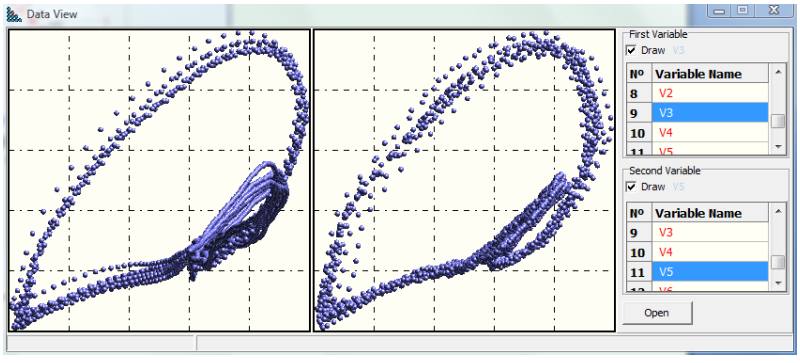
In the example on the left one may see two complexity maps corresponding to a baseline ECG (in red) and to a post-implant ECG (blue). The figure below illustrates an example of coupling between two ECG channels (V3 versus V5) in the baseline situation (left) and post-treatment (right).

OntoCare™ measures the difference between the topologies of the pre and post-treatment Complexity Maps. Once the topological distance has been determined, OntoCare™ ranks the contribution of each observable to the said distance. With this information it is possible to determine where and to what extent has therapy been successful.

With OntoCare™ it is possible to actually measure the impact of:

- Surgery
- Implant
- Drug treatment

In the case illustrated above, the overall impact of therapy (ablation) has been shown to be approximately 63%.



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ONTOMED COMPLEXITY & MEDICINE