



BEAT-AF testimonial

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About BEAT-AF

The [BEAT-AF](#) project, [Ground-BrEAKing Electroporation-based inTervention for Atrial Fibrillation treatment](#), is an [Horizon 2020 action](#) funded by the European Commission and HADEA (European Health and Digital Executive Agency) for 60 months as of 1 March 2021. Atrial fibrillation (AF) is the most common arrhythmia, with over 10 million people affected in Europe and accounting for 1/3rd of cardiovascular health care expenses. AF reduces quality of life and may result in stroke, heart failure, dementia and death. Catheter ablation is an established treatment for AF. The cornerstone for AF ablation is Pulmonary Vein Isolation (PVI) and has shown to be effective at preventing AF recurrences. Catheter ablation of AF uses thermal energies, either heat through radio-frequency (RF) ablation or either cryothermal (cryo) energy. Common to these thermal energy sources is the fact that they ablate all tissue types indiscriminately and thereby may result in collateral damage of structures close to the heart such as the esophagus or nerves. Currently, the success rate and safety of the ablation procedure largely depends on the experience of the operator, with success rates of 90% at 1 year follow-up in experienced centers.

The BEAT-AF consortium gathers 9 European renowned clinical centers in France, Belgium, Czechia, Germany and Austria. Together we strive to revolutionize AF treatment through catheter ablation and contribute to decrease the huge burden of AF in Europe. The goal of BEAT-AF is to disrupt AF ablation by achieving fast, safe, effective and durable PVI in every center and for every operator through the use of a novel ablation energy, called Pulsed Electric Field energy.

BEAT-AF aims to revolutionize AF ablation

If one was to imagine the ideal AF ablation procedure, it should be easy to perform, within one hour or less, associated with a single procedure success rate exceeding 90% at 1 year follow up, with no risk for fatal or disabling complications. This was already shown in very experienced hands with success rate of 90% and good safety, but not in every center. It may sound utopic, but we strive towards fast, safe, effective and durable PVI in all centers.

BEAT-AF aims to significantly advance AF ablation, by using a completely new energy for cardiac ablation: Pulsed Electric Field energy (PEF). In contrast to thermal modalities resulting in discontinuous lesions with no tissue selectivity, pulsed field ablation is a non-thermal ablative modality in which ultra-rapid high voltage electrical fields are applied to destroy the cardiac tissue. It creates nanoscale pores in cell membranes, a process called electroporation, leading to cell death. The most unique and fascinating characteristic of PEF is its tissue selectivity: tissues have specific characteristic threshold field strengths that induce cell death. Interestingly, cardiac cells have a very low threshold and are thus highly sensitive to PEF, making this energy uniquely suited for AF ablation. In contrast, nerve and esophageal cells are virtually insensitive to the field strengths used in cardiac PEF suggesting an excellent safety profile.

Together with the other members of the BEAT-AF consortium, the department of electrophysiology of the AZ Sint-Jan Hospital in Bruges has contributed to the pre-clinical development, the first in man studies and first registries of treatment of AF patients using PEF-



based PVI. These pilot studies showed that PEF was, safe, highly selective for cardiac tissue, effective and efficient.

The overall aim of the BEAT-AF multicenter randomized study is to demonstrate within a 5-year project that PVI using PEF catheter ablation is superiorly effective compared to the gold standard of RF ablation with no damage to collateral structures, in patients with atrial fibrillation. The department of electrophysiology of the AZ Sint-Jan Hospital in Bruges will contribute to the main trials in paroxysmal and persistent AF, as well as different substudies, most notably involving redo procedures for the treatment of AF using catheter ablation.