

Integrating novel care approaches for atrial fibrillation patients undergoing ablation

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Impact

SCIENTIFIC AND SOCIETAL IMPACT

Affecting over 43.5 million patients worldwide and over 350,000 individuals in The Netherlands, atrial fibrillation (AF) is the most commonly encountered sustained arrhythmia.^(1,2) Its prevalence continues to grow due to increasing predisposing risk factors, improved detection methods and improving life expectancy, and so does its associated burden on health care systems.^(3,4) Over the past decades, catheter ablation has been emerging as an effective therapy to prevent AF recurrences and AF-related complications and to improve quality of life.^(5,6) These facts together with improving techniques and higher accessibility have led to a doubling of the number of catheter ablations in the Netherlands in only eight years: from 2,627 procedures in 2013 to 5,350 in 2021.⁽⁷⁾ This expansive growth highlights the need for a critical reappraisal of the structure of peri-AF ablation care. The work reported in this thesis focused on the integration of several novel care approaches in standard care for patients undergoing catheter ablation.

Several results presented in this thesis have already directly impacted clinical AF care as practiced in the Maastricht UMC+ and the Radboudumc. As previously described in more detail (**chapter 10**), the integration of the ISOLATION study into standard care (**chapter 2**) has led to increased awareness for risk factor management (**chapter 5**) before and after AF ablation and has led to implementation of a structured, fully remote screening and management pathway for sleep disordered breathing (**chapter 6** and **chapter 7**). In addition, restructuring the pre-AF ablation care pathway (**chapter 3**) has led to a decreased use of resources and a lower time burden placed on patients undergoing catheter ablation.

Scientifically, large-scale registries with real-world data, such as the ISOLATION study (**chapter 2**), play an important role in advancing the understanding of AF mechanisms and therapies.⁽⁸⁾ They provide data from a diverse range of AF patients that may be used for clinical and translational research. The integrated approach of the ISOLATION cohort study allowed the study to grow into an umbrella under which a range of study topics have been added. The first results of some of these topics are presented in **chapters 5-7**. However, the majority of these studies is still ongoing and new ones are continuously being added in a fruitful multidisciplinary collaboration of researchers from the Departments of Cardiology, Cardiothoracic surgery, Radiology, Anesthesiology, Pulmonology, Physiology, and Biomedical engineering (*Figure 1*). Furthermore, the preparations for the subsequent, long-term 'ISOLATION 2.0' study are

currently in progress. The main ISOLATION results, as well as most results from different substudies, are expected in the coming years. Therefore, the largest scientific impact of the ISOLATION study is presumably still to come.

Uniform integration of mobile health (mHealth) approaches into standard AF care, although highly promising, is being hampered by the multitude of different apps, devices, platforms, and methods that are being used, and structured mHealth pathways are still lacking. The photoplethysmography (PPG) dictionary (**chapter 4**) and Virtual-SAFARI pathway (**chapter 6**) incorporated in this thesis aim to provide blueprints for more uniform use of two different mHealth options. The PPG dictionary was composed as part of the TeleCheck-AF project, an mHealth infrastructure for remote management of AF.⁽⁹⁾ This infrastructure was developed in the Maastricht UMC+ and has now spread to over 40 centers across Europe.⁽¹⁰⁾ In many of these, this mHealth approach has impacted daily AF care. To our knowledge, the Virtual-SAFARI approach, providing an mHealth approach for remote screening and management of sleep disordered breathing, is currently only applied in the two initiating centers (Maastricht UMC+ and Radboudumc). However, the interest of the scientific community in such integrated remote pathways is highlighted by the fact that this research was nominated for and awarded with several prizes by local, national and international societies.

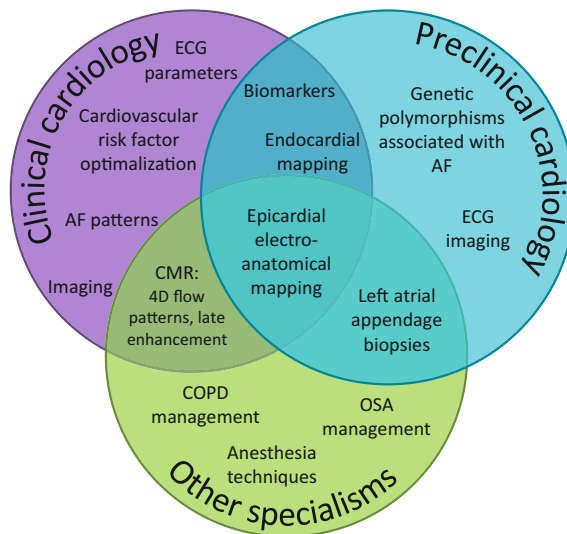


Figure 1. Multidisciplinary involvement and research topics studied under the umbrella of the ISOLATION study.

Abbreviations: AF: atrial fibrillation, CMR: cardiac magnetic resonance imaging, COPD: chronic pulmonary obstructive disease, ECG: electrocardiography, OSA: obstructive sleep apnea.

The ongoing RACE-8-HF study (**chapter 9**) aims to further elucidate the impact of catheter ablation in patients with concomitant AF and heart failure. The results of this study are not yet available, but are aspired to strengthen knowledge on the optimal treatment for the expanding group of patients suffering from both diseases.

In conclusion, the work described in this thesis has directly impacted clinical care for AF patients undergoing catheter ablation in the Maastricht UMC+ and the Radboudumc, and potentially in other centers beyond these two. The ongoing studies presented in **chapter 2 and 9** are expected to lead to new insights into optimal patient selection for invasive care, ablation techniques, and AF mechanisms, and will influence care for future AF patients.

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