Introduction
General introduction

Service delivery at a referral medical centre is historically considered as a “last resort opportunity”, in which doctors implement advanced and highly specialised care. It is also widely known that the effectiveness and efficiency of academic clinical reasoning differs from daily approaches of similar disease patterns in community centres. This may partially be explained by the fact that medical practitioners at referral centres have a leading role in improving quality of clinical practice through innovation.

Cardiovascular innovations are those improvements in functionality or performance of diagnosis and treatment such as positron emission tomography (PET), non-fluorescent electromechanical endocardial mapping (NOGA), immediate angioplasty of early graft failure, laser revascularisation, vascular endothelial growth factor (VEGF) gene and ablation therapy. These innovations or advanced modalities almost always outstrip the ability of main stream patients to utilise it. Moreover, it is likely that they are not yet included in most recent guidelines. At high-volume referral medical centres these advanced modalities are implemented in complex cardiovascular cases with good clinical outcome. However, they may overshoot the need of less demanding patients. This is the innovator’s dilemma, as most doctors do and improve what they do best, they may overshoot the need of many patients they serve.

Against the background of the clinical triangle formed by ischemia, heart failure and arrhythmia, an appropriate knowledge platform may be created to explore patient’s value of aforementioned modalities. Bringing together a combination of distinctive competencies in practice creates this unique value that others may find interesting and difficult to emulate.

Part I focuses on patients with left ventricular dysfunction (LV). Should we initiate treatment of the stable patient after an overall clinical assessment or should we try to elucidate and monitor precise operating pathophysiological patterns and causative mechanisms? On the one hand, scrutinising underlying clinical patterns may implicate time delay for the implementation of any treatment strategy (physician’s delay on top of patient’s delay). On the other hand, improving insight in these same underlying disease patterns, may support clinical reasoning and clarify the role of implemented advanced diagnostic and treatment modalities. What are possible options in this patient category after diagnosing LV dysfunction? The clinical impact of metabolic derailment by PET imaging is investigated. The implementation of VEGF gene and laser therapy is assessed at the myocardial and coronary vasomotor level. Finally, the role of NOGA in clinical decision-making is studied.

The second part focuses at patients with atrial fibrillation. This rhythm disturbance may become refractory to drug treatment. It should be emphasised that persistent symptoms in these patients may mask underlying ischemia and left ventricular dysfunction. Therefore, it is warranted to investigate whether these causes are present to treat them appropriately.
Thereafter definite and advanced percutaneous strategies may be implemented to improve patient symptoms and quality of life.

In the final section we would like to focus on subjects with recurrent ischemia after revascularisation. Next to the post-angioplasty patient group in which restenosis remains an important clinical issue, the patients with recurrence of ischemia after surgical revascularisation may be considered as a separate category. Both groups harbour different mechanisms of action underlying recurrent ischemia. In part III we would like to assess the impact of risk factors and coronary angioplasty in patients after surgical revascularisation during daily clinical practice. The results may support current changing patterns of invasive cardiovascular care.

**Aims of the thesis**

This thesis tenders a scenario that may provide insight into clinical performance of advanced invasive cardiological approaches for complex cardiac patients. Specific modalities such as PET, NOGA, VEGF gene, pacing and ablation therapy and clinical approach of the postrevascularisation patient group are assessed. Subsequently, overall results should be able to suggest what their individual or combined clinical value in daily practice is.

**Reference List**
