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## Patient-reported outcomes after cardiac surgery

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CHAPTER

**1**

GENERAL INTRODUCTION

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### *Origin of cardiothoracic surgery*

During the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, surgery to correct cardiac trauma or existing cardiac conditions was considered to be highly experimental (1). In 1913 Alexis Carrel performed the first coronary bypass surgical procedure on a dog, with use of a carotid artery segment as a bridge between the aorta and left coronary artery (1). His operation encountered great resistance from his colleagues, nevertheless he predicted that coronary bypass could be performed on humans in the foreseeable future. It took almost 50 years until the first successful coronary bypass operation was performed by Robert Hans Goetz in 1960 (1). In the subsequent years more and more people underwent coronary artery bypass grafting (CABG). Meanwhile, other cardiac conditions like valve stenosis and atrial septal defects were successfully treated with open-heart surgery and the department of cardiovascular- and thoracic surgery was founded.

### *Current status and developments*

Nowadays, cardiovascular disease (CVD) is the number one cause of death worldwide and the number two cause of death in Europe (2). In 2018, 37.769 people in the Netherlands died due to cardiovascular disease, with an average age of 78 years for men and 84 years for women (3). Due to improvements in operative techniques along with general advances in medicine (i.e. secondary prevention after myocardial infarction), people with CVD are becoming older, leading to an elderly population undergoing cardiac surgery. More than half of the cardiac surgery interventions are being performed in patients older than 75 years and this group is rising over time (4).

Together with an aging patient population, the importance of outcome measures has shifted from the physician's perspective toward the patient's perspective (5). Patient Reported Outcomes (PROMS) such as symptom relief, quality of life or satisfaction with care, are reported directly by the patient without interpretation by a physician or other medical professional (6). These types of outcome measures are better met with measures of *patient-centered* outcomes, because they are of particular concern to the patient (7). The World Health Organization defines Quality of Life (QoL) as 'an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns' (8). It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment (8). QoL encompasses not just the absence of disease but the presence of physical, mental and social well-being, judged by the person himself and is therefore subjective. QoL has become an increasingly important aspect in medicine and social sciences over the last years. Currently, QoL is regarded as a quality indicator by hospitals and other healthcare institutions because it provides information on the experience of patients and can therefore improve quality of care.

Although the first publications on QoL post cardiac surgery date from the beginning of the 1970s (9,10) and QoL is often addressed in the ESC/EACTS treatment guidelines for cardiac disease (11,12), the evidence base for postoperative patient-reported outcome measures including QoL after cardiac surgery, is still in its infancy and needs to be strengthened (13–15). Studies are needed to provide doctors and other allied healthcare professionals with reliable data to evaluate potential harms and benefits of a cardiac surgical treatment on QoL and other patient-reported outcomes. Subsequently patients and their families can be informed on the harms and benefits of a treatment during preoperative counseling to enable shared-decision making. Shared-decision making is an approach where clinicians and patients share the best available evidence when faced with the task of making decisions and where patients are supported to consider options, to achieve informed preferences (16).

## AIMS AND OUTLINE OF THIS THESIS

This thesis focuses on the impact of cardiac surgery on patient's daily lives by studying QoL and several other patient-reported outcomes after cardiac surgery. The overarching aim of this thesis is to contribute to the knowledge of patient-reported outcomes after cardiac surgery. Three major questions are addressed in this thesis:

1. What is the influence of cardiac surgery on patient-reported outcomes such as quality of life and return to work?
2. Do patients undergoing cardiac surgery, benefit from cardiac rehabilitation in terms of patient-reported outcomes?
3. Are elderly patients more at risk of a decreased quality of life after surgery?

The following chapters deal with different aspects of these three questions. In **chapter 2** results of cardiac rehabilitation after cardiac surgery on various outcomes are reported in a systematic review. In **chapter 3** the results of an observational study on quality of life among elderly patients compared to younger patients one year after CABG are described. **Chapters 4 and 5** involve the results of a multicenter study on quality of life among patients in different age groups after CABG or surgical aortic valve replacement. **Chapter 6** comprises a qualitative study describing the experiences and opinions of patients and their spouses on return to work after CABG. **Chapter 7** reports the outcomes of a prospective study on the prevalence of postoperative cognitive dysfunction and the association with quality of life after CABG. In **chapter 8** the protocol for the Heart Rehabilitation in patients awaiting Open heart surgery targeting to prevent Complications and to improve Quality of life (HEART-ROCQ-study) is described. Finally, **chapter 9** provides a general discussion of the study results, their clinical implications and addresses possible directions for future research.

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