Optimizing breast reconstructive surgery in the Netherlands using clinical audit data

Bommel, A.C.M. van

CHAPTER 1

General introduction and outline of this thesis

GENERAL INTRODUCTION AND OUTLINE OF THIS THESIS

Systematically monitoring treatment outcomes was first described over a century ago by Ernest A. Codman. In his view, the results of every treated case ought to be registered and at all times accessible for evaluation by members of the staff, trustees, administration or other authorized investigators. In his time, evaluating and improving healthcare by reflecting on actively collected outcome data was a progressive thought.[1]

Today, many have adopted the view that evaluating care by the analysis of outcomes of treated patients is an important step in the "Plan Do Check Act (PDCA)" cycle to improve healthcare quality.[2] Clinicians, hospitals, and countries have collectively embraced clinical auditing and adhere to the concept of systematically measuring and subsequently improving quality of care. While individual professionals and institutions aim to evaluate and improve their own performances in relation to peers, society calls for transparency of the quality of care to enable patients to choose a healthcare provider based on reliable information. Other stakeholders such as healthcare insurance companies and the healthcare inspectorate also demand transparency of the quality of care given in hospitals.

In the Netherlands, nationwide clinical auditing on an institutional level was catalyzed by the increased interest of the national healthcare inspectorate (IGJ)[3] in the relationship between hospital volume and outcomes of surgical care at the beginning of the 21st century. Following the nationwide query of the institutional volume of esophageal surgery in 2006 and the publication of institutional rates of tumor positive margins in patients undergoing breast conserving surgery in 2008,[3,4] nationwide clinical auditing was swiftly implemented for several surgical oncological disorders.

The Initiation of a National Breast Cancer Audit in the Netherlands

The National Breast Cancer Organization Netherlands (NABON) was established in 1999 to improve multidisciplinary care for breast cancer patients, an initiative started by clinicians.[5] Initially, NABON pursued publishing national treatment guidelines

as well as guidelines to optimize institutional infrastructures. In 2011, NABON, the Dutch Institute for Clinical Auditing (DICA)[6] and the Comprehensive Cancer Organization the Netherlands (IKNL)[7] joined forces and initiated the NABON Breast Cancer Audit (NBCA).[8] Representatives of all medical specialties involved in breast cancer care defined a number of multidisciplinary quality indicators to measure different aspects of breast cancer care. These indicators reflected adherence to existing diagnostic work-up and treatment guidelines. Full participation of all Dutch hospitals in the Netherlands was realized within a few years.

The primary goal of the NBCA is to monitor the quality of provided breast cancer care in hospitals in the Netherlands by offering participating individual hospitals feedback on their results in relation to "real-time" national benchmark information with case-mix adjustment if needed. The second objective, comparison of hospital performances using quality indicators, is a more complex endeavor weighing multiple factors, and interpreting the results should be done with caution. First, defining unambiguous quality indicators reflecting the quality of breast cancer treatment is not as easy as it seems and is still an ongoing process. Second, case-mix adjustment can only compensate for variation in outcomes as long as the involved confounding factors are identified. Moreover, even following case-mix adjustment, interpreting the remaining hospital variation has to be done with certain caution. Exploring observed variation on a national level serves as the "Check" step, and may result in the adjustment of guidelines as an "Act" to close the PDCA cycle.

In the present form of the NBCA, (reconstructive) surgical items are well covered. Breast conserving surgery has been performed in the majority of patients diagnosed with breast cancer during the last 40 years and consequently has been the cornerstone of surgical breast cancer care. Combining mastectomy with an immediate breast reconstruction was introduced more recently and its increasing use on a national level demonstrates the increased awareness of the importance of esthetic outcomes after breast cancer surgery. Zooming in on an institutional level, variation in collaboration between surgical oncologists and plastic surgeons as well as in hospital organizational factors may result in substantial variation in the

use of immediate breast reconstruction across the Netherlands. In addition, the increasing use of systemic therapy in the neo-adjuvant setting and more extensive radiotherapy following breast conserving surgery as well as after mastectomy are to be addressed in a national audit to understand variation in treatment patterns over time or between hospitals.

The ultimate treatment goals in breast cancer care are to improve survival and the quality of life of patients. The risk of life-threatening short-term treatment-related complications is very low and long-term prognosis is very good in patients diagnosed with primary breast cancer. Therefore, there is an increasing interest in patient-reported outcome measures (PROMs) as a means to better understand the effects of the disease and its treatment on the quality of life as perceived by patients. For example, esthetic outcomes after breast cancer surgery and breast reconstruction are undoubtedly important from a patient perspective and should therefore also be considered by clinicians together with patients in the decision-making process.

The aims of this thesis were to describe the nationwide implementation of clinical auditing of breast cancer treatment in the Netherlands, to investigate the hospital variation of (reconstructive) surgical breast cancer care, and to identify factors which may reduce the variation found and may optimize the use of breast reconstructive surgery. This is outlined in the following chapters:

- The institution of the NBCA, the initially used quality indicators and the results of the first four years of nationwide clinical auditing are reported in **Chapter 2**.
- The evolution of meaningful quality indicators is an ongoing process. The NBCA traditionally used the quality indicator "proportion of patients undergoing breast conserving surgery" as cosmetic outcome of breast cancer surgery, however, other treatment modalities may contribute to a favorable cosmetic outcome as well. **Chapter 3** describes the development of a quality indicator that comprises all efforts to preserve or restore the breast contour: Breast-contour-preserving procedure (BCPP).

- Practice patterns and hospital variation with respect to the treated population of patients who underwent immediate breast reconstruction following mastectomy for restoration of their breast mound is analyzed in **Chapter 4**. To adjust for institutional differences, this chapter analyzes which patient and tumor case-mix factors contribute to the observed hospital variation and to what extent variation remains after adjustment for these factors.
- Aside from patient case-mix factors, hospital and hospital organizational factors affecting the use of immediate breast reconstruction after mastectomy for ductal carcinoma in situ (DCIS) and invasive breast cancer are investigated in **Chapter 5**.
- Trying to identify all possible factors affecting the use of immediate breast reconstruction led to the analyses in **Chapter 6**, evaluating differences in the attitudes of surgeons and plastic surgeons towards immediate breast reconstruction following mastectomy.
- The effect of being informed about immediate breast reconstruction on the likelihood of receiving an immediate breast reconstruction accentuates the importance of pre-operative information provision, which is described in **Chapter 7**.
- In **Chapter 8** a breast surgery specific PROM is used to compare quality of life of patients after mastectomy with immediate breast reconstruction and following mastectomy only, because patient-reported outcomes are important to improve counseling and shared decision-making of all patients treated for breast cancer.

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