

Reduced Elective Surgery Cancellations Through Patient Involvement In Pre-Operative Planning In Norway

Conceição Granja

Norwegian Centre for Integrated Care and Telemedicine
University Hospital of North Norway
Tromsø, Norway
conceicao.granja@telemet.no

Stein Roald Bolle

Norwegian Centre for Integrated Care and Telemedicine
University Hospital of North Norway
Tromsø, Norway
stein.roald.bolle@telemet.no

Kari Dyb

Norwegian Centre for Integrated Care and Telemedicine
University Hospital of North Norway
Tromsø, Norway
kari.dyb@telemet.no

Gunnar Hartvingsen

Norwegian Centre for Integrated Care and Telemedicine
University Hospital of North Norway
Tromsø, Norway
Department of Computer Science
University of Tromsø
Tromsø, Norway
gunnar.hartvingsen@telemet.no

Abstract—Surgery cancellations are undesirable in hospital settings as they increase costs, reduce productivity and efficiency, increase waiting lists, and directly affect the patient. The elective surgery cancellations problem in a North Norwegian University Hospital is addressed. Based on observations and interviews, conducted at the hospital, lack of information during the pre-operative planning was identified as the main cause of elective surgery cancellations. The problems with the existing pre-operative process were identified and a new process is proposed. By studying the pre-operative planning at the hospital, we have determined that part of the information flow can be moved to the patient at home. From the work presented herein, we conclude that the assessment information required during the pre-operative planning can be compiled in a personal health assessment questionnaire, and requested from the patient, at an earlier stage.

Keywords—elective surgery cancellations; pre-operative planning; communication; process optimization; Norway

I. INTRODUCTION

Surgical departments are simultaneously the major source of investment, and the greatest source of revenue for most hospitals [1, 2]. However, it is known that between 10 and 40 % of elective surgeries are cancelled [1, 3-5]. In western countries, up to 20 % of elective surgeries are cancelled on the day of surgery [6-8]. Furthermore, it has been reported that 50 % of these cancellations might be avoided [1, 9, 10].

Surgery cancellations are undesirable in hospital settings as they increase costs, reduce productivity and efficiency, increase waiting lists, and directly affect the patient [3, 8, 11]. Considerable resources are invested in maintaining operating theatres, and having surgeons and theatre staff available on an agreed schedule [1, 12]. In spite of this, the cancellation rate of elective surgeries is high, especially in the public sector [9,

13]. Cancellations can significantly inconvenience patients and their families [14, 15]. It is also reported that patients may suffer psychological stress, and/or financial hardships [9]. Accordingly, cancellations are stressful and costly, with a high level of emotional involvement before surgery [1].

The causes for elective surgery cancellation are diverse and may be divided in two major categories: (a) hospital, and (b) patient related reasons, when considering who took the underlying decision to cancel. Hospital related reasons are the most frequent and encompass causes such as the unavailability of the surgical team [3, 7, 8], incomplete pre-operative study/preparation [7, 16], lack of surgical/anesthetic readiness [7, 8], and lack of theatre time due to extended duration of scheduled surgeries [7]. On the other hand, patient related causes are mostly due to patient no-shows and refusal to undergo surgery [7, 8, 16]. It is argued that the majority of cancellations are due to information that existed prior to the day of surgery, but was not available when required [9, 13, 17-20].

In line with what is reported in literature, our site of research, the University Hospital of North Norway (UNN), has identified inadequate planning due to lack of information as a main cause for cancellations (Figure 1). The hospital has reported that more than 50 % of all cancellations at UNN are related to inadequate pre-operative planning [17]. It is anticipated that the pre-operative planning process may be improved if adequate patient information is gathered at an earlier stage, before the patient is admitted at the hospital.

In this paper, the elective surgery cancellation problem caused by inadequate pre-operative planning, in a University Hospital in Norway, is addressed. We started by mapping and evaluating the pre-operative process at UNN, and explored a system for gathering information from patients on his/her condition through a personal health assessment questionnaire.

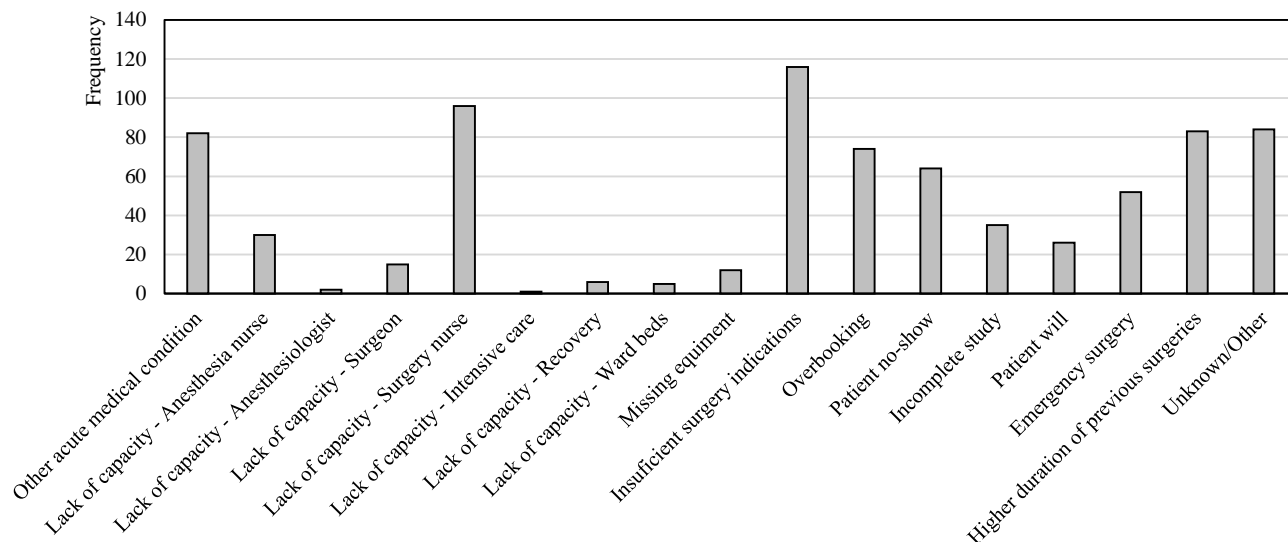


Figure 1. Causes for day of surgery cancellations distribution at UNN from January to June 2011.

This paper is divided in six sections. In the first section the problem object of the study is described and classified according to its causes. In the second section a brief review of the state of the art is presented. Data collection methodologies, with which the results were obtained, are presented and explained in the third section. The results are disclosed and interpreted in sections four and five. In the last section conclusions about the results are drawn, and some indicators of future work in the area foreseen.

II. BACKGROUND

Elective surgery cancellations, due to lacking information, at UNN are mainly related to inadequate pre-operative planning. In literature, pre-operative planning is reported to be approached in several different ways. A brief literature review on some of the approaches is presented below.

A widely studied approach to the elective surgery cancellation problem is the establishment of pre-operative assessment clinics (POACs). The aim of a POAC is to prepare patients for the administration of anesthesia and for surgery. The implementation of POACs may take different configurations relating to the worker leading the appointment. Doctor-led POACs were implemented by [16, 21-23] in an attempt to solve elective surgery cancellations due to lacking information. In this settings, patients are referred to the POAC either from the ward or the outpatient clinic. It was concluded that the number of cancellations was reduced but considered not significant [16]. In nurse-led POACs [24-26] the role of the physicians is transferred to the nurse. Thus, in such environments, the pre-operative assessment is undertaken by nurses, with overall supervision of a consultant anesthesiologist. Nurse-led pre-operative assessment systems POACs do not address the hypothesis that the pre-operative assessment information may be collected from the patient at home.

A different approach to improve pre-operative planning is to re-evaluate the role of health workers in the pre-operative process, and create tools that enable the transfer of responsibilities from physicians to nurses. It is advocated that the pre-operative assessment of elective surgical patients may be undertaken by trained nurses [18, 27, 28]. Following this hypothesis, nurse-led pre-operative assessment systems have been implemented [18, 27, 28], using protocols to guide nurses in the decision making process. Nurse-led pre-operative systems do not address the hypothesis that the pre-operative assessment information may be collected from the patient at home.

Searches on the major academic literature databases (e.g. PubMed, Web of Science, Inspec, SCOPUS), on pre-operative planning that use communication with the patient at home, did not retrieve any relevant result. Following, an approach to the problem of elective surgery cancellations by contacting the patient at home is presented.

Telephone calls are being studied as a solution to reduce elective surgery cancellations, due to patient no-shows, on the day-of-surgery [29, 30]. Such studies propose a communication channel between the patient and the provider to enable the confirmation of the patient's intention to attend surgery, or simply address patient questions and concerns. Information exchange between health personnel and patients, while the patients are still at home, may solve some of today's challenges with late pre-surgical planning and, consequently, cancellations of surgical procedures.

The aim of our research is to reduce the elective surgery cancellations at UNN, by studying pre-operative planning and determine if it may be moved from the hospital to the patient at home. We will explore if surgical patients and health personnel can collaborate in a team while the patient is still at home, and if this reduces elective surgery cancellations, by better preparing hospitals and patients for surgical procedures.

III. MATERIALS AND METHODS

The management at UNN, our site of research, is determined to reduce the cancellation rate at the hospital. Resources have been allocated, and a Lean process for elective surgical patient pathways at the Operation and Intensive care clinic has been initiated at UNN. Lean projects are commonly used to transform healthcare organizations for improvements in patient care through the development of a quality driven culture [11]. At UNN, Lean is defined to concern the right things at the right place, time and amount, with a minimum of waste while, at the same time, being flexible and prepared for changes. The Lean process at UNN is organized as a project team, including a project manager, a Lean consultant, a Lean mentor, an economics and an IT-consultant. In addition, the Lean project has an executive board, a project group and a focus group. At the start of the Lean Project, the focus group, which is the actual working group, consisted of; one anesthetist nurse, one theatre nurse, two anesthesiologist, three surgeons, one member of the staff responsible for sterilization of surgical equipment, three staff members responsible for elective surgery planning and waiting lists in the surgery ward, one pediatric nurse, two ICT consultants (one responsible for the EHR), one employee representative, and one user (patient).

Two researchers from our research team have followed the Lean process since the initial group meeting in April 2012. One has participated solely as a researcher, conducting observations during Lean meetings, while the other had an active role and contributed as an anesthesiologist in the Lean process. The researchers observed and participated in more than twenty meetings. In addition to following the Lean process, we have accomplish three weeks of fieldwork at the Operation and Intensive care clinic, conducting observations and unstructured interviews while following an anesthesiologist and an anesthetist nurse in their daily work. We have also conducted thirteen structured interviews with physicians, nurses and administrative personnel.

Data collected through observations and interviews was analyzed together with observational data from the Lean project. Our analytical qualitative approach focuses on the interaction between technical and social factors that produces particular outcomes [31]. The preliminary results are limited to the identification of the information needed for pre-operative assessment from the anesthetists and surgeons' point of view.

IV. RESULTS

The observations and interviews, described in section III, allowed the definition and mapping of the generic pre-operative process model shown in Figure 2. A process model facilitates a systematic description of the events permitting the identification of decision activities, and the health worker responsible for each of them. In addition, it allows us to learn about the information flow, and to identify the underlying process issues that are causing the patient assessment information not to be available when required. At UNN, as seen in Figure 2, final pre-operative planning is often done after the patient has arrived for the scheduled surgery. Which means, the final pre-operative planning might be done the day before, or even on the day of surgery. During this final planning process, new information is gathered from patients which may lead to cancellations.

Considering the data collected during the observations and interviews, and the analysis of the existing pre-operative process, all the decision activities were identified and characterized. Based on the information requirements on each of those activities, a new pre-operative process was proposed. In the new pre-operative process the assessment information is requested to the patient at an earlier stage and while the patient is still at home. The assessment information identified as required might be included in the personal health assessment questionnaire which some departments ask the patients to fill out and bring to the hospital when hospitalized for surgery.

V. DISCUSSION

This paper addresses the elective surgery cancellations problem at UNN, a North Norwegian University Hospital. Observations and interviews were conducted at UNN, and lack of information during the pre-operative planning was identified as the main cause of elective surgery cancellations. The problems with the existing pre-operative process were identified and a new process was proposed. In the new process, the assessment information is systematized in a personal health assessment questionnaire, and provided by the patient at an earlier stage, while the patient is still at home.

The mapping of a generic pre-operative process model facilitated the identification of the decision activities, and the health worker responsible. The identification of activities, and their responsible health worker, allowed us to carry out semi-structured interviews to determine the information required to complete the pre-operative assessment. Surgeons and anesthesiologists at UNN considered that the identified information may be provided by the patient. Some departments ask the patients to fill out a personal health assessment questionnaire and bring it to the hospital when hospitalized for surgery. The information classified as required might be included in this questionnaire. Such questionnaires can be sent to the patient through the postal system, and the patient can fill it out at home.

In developed countries, like Norway, where the population is well prepared and able to use ICT (e-readiness), a new approach is possible [32] to promote patient-centered health care [33, 34]. Many patients [35], including elderly or less-educated [36], are strongly motivated to use electronic services [37]. This has been implemented at the Mayo clinic (Rochester, MN, USA) for primary care, with a 40 % decrease of office visits [38]. Increased collaboration with patients, as active participants, through ICT solutions, are also defined as a priority area, as stated in the Norwegian Ministry of Health and Care Services' Coordination Reform [39]. Currently, an extensive ICT investment is taking place in the northern health region of Norway, including at the UNN hospital, our site of research. Helse-Nord, the Northern Norway Regional Health Authority, is investing € 62.5 million in the FIKS (from the Norwegian *Felles innføring kliniske systemer*) project to develop the electronic health record for the future — a fundamental tool for high-quality patient treatment [40]. The planning tool on the surgical module in the EHR system has been recognized as an unused resource by FIKS, Helse-Nord and the Lean Project [40]. The described health care trends in Norway open new possibilities to approach the elective surgery cancellation problem.

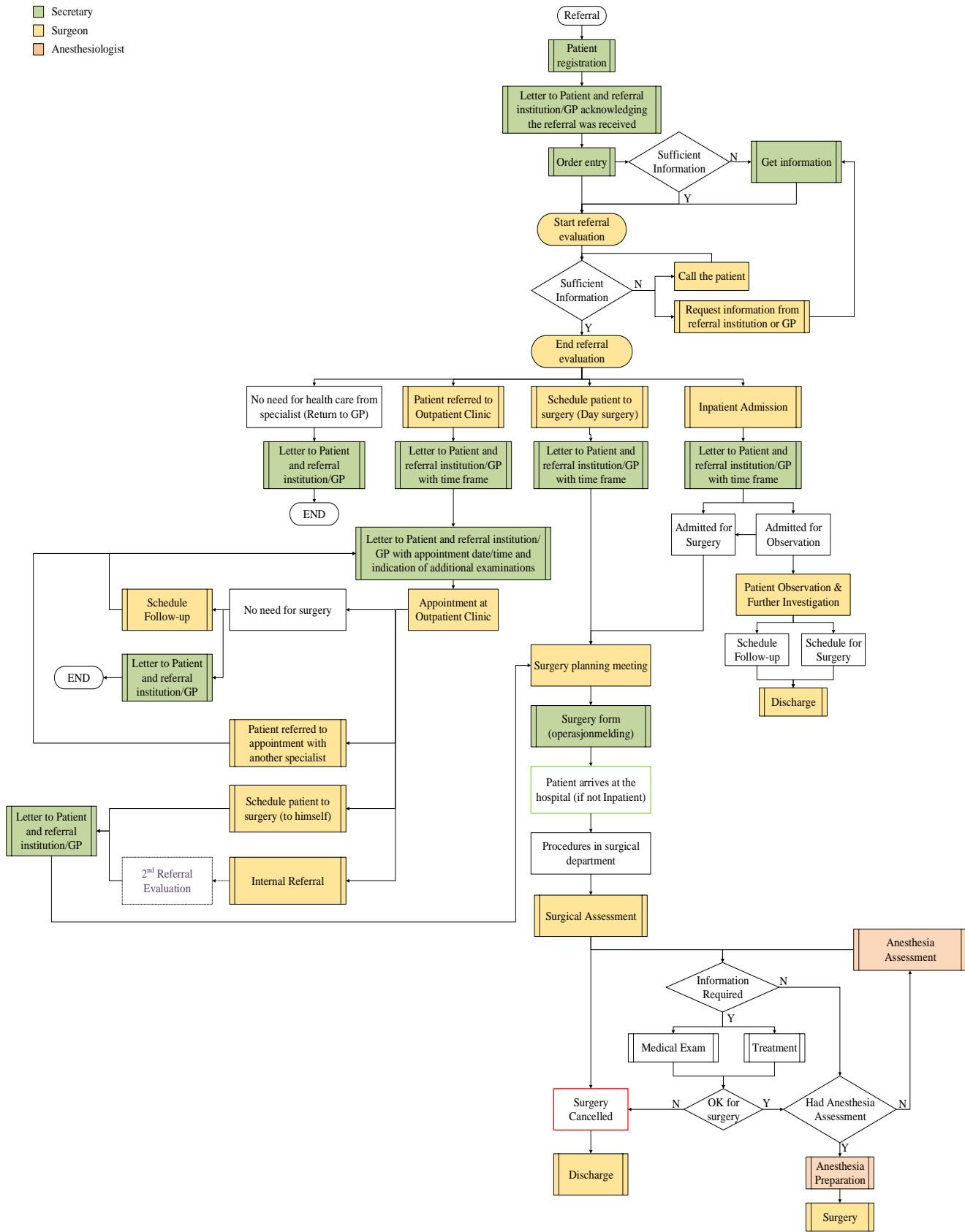


Figure 2. Scheme of the surgery process at UNN. Assessment activities after patient arrival (Box with green border), may contribute to late cancellations (box with red border) while there are many possibilities for hospital-patient interaction at earlier stages (Letters to patient and patient at the hospital).

VI. CONCLUSIONS

By studying the pre-operative planning at UNN, we have determined that parts of the information flow can be moved to the patient at home. From the work presented herein, we conclude that the assessment information required during the pre-operative planning can be compiled in a personal health assessment questionnaire, and requested from the patient, at an earlier stage.

The authors acknowledge that the paper-based pre-operative planning process proposed is not in line with the best practices suggested in literature. When using the postal system the information flow between the patient and the hospital is time consuming, and it is not possible for the hospital to confirm the reception and submission of the personal health assessment questionnaire. At the same time, due to: (a) the patient prioritization rules in Norway [41], (b) waiting list, (c) and emergency surgeries, surgeries can be delayed and the patient might be requested to complete the personal health assessment questionnaire more than once. On the other hand, when asking the patient to answer a personal health assessment questionnaire from home, the patient might require support from health workers when interpreting the questions, and selecting the relevant information.

The international healthcare trends on paperless and patient focused clinical processes, combined with the e-readiness in Norwegian society, point to new possibilities on how to gather assessment information from the patient at home. To access this information, low-cost communication with patients and their families has been recommended [12]. Thereby improving pre-operative planning, and reducing the number of cancellations, due to lack of information. In order to enable the communication between the patient and the hospital, the interaction with patients should take place through a variety of synchronous and asynchronous secure communication channels, including phone, messaging systems, email, and web-pages.

As patients use several types of communication devices, they should have the opportunity to be contacted on different platforms as well, such as smartphones, pads, and laptops.

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