

# Health Communication and Information Exchange in a Vascular Surgery Patient Trajectory

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**Abstract.** Health communication and information exchange is important in public health. Despite the fact that adequate health information is a patient right according to Norwegian law, complaints from patients to the authorities on lack of information and communication are frequent. The purpose of the paper is to discuss health communication and health information exchange for patients undergoing vascular surgery for abdominal aorta aneurism (AAA), with particular focus on the communicative practices in a typical patient trajectory for this cohort. Both verbal communication and written information exchanged through health information systems during the patient trajectory are included in the data. The project is theoretically and analytically inspired by linguistic and discourse analytical perspectives on information and communication about health.

**Keywords-** Health information exchange; health communication; digital health; patient trajectory; aorta aneurism.

## I. INTRODUCTION

Health communication is important in public health [1]. Information exchange and health communication is essential for patients' confidence in the healthcare services. Trust is a basic premise for good patient care, and is an important patient right in Norway. The Patient Rights Act [2] is specifically designed to "promote trust between the patient and healthcare services, to promote social security and respect for the individual patient and the user's life, integrity and human dignity". However, the feedback from patients and clients demonstrates that information exchange and health communication are areas for improvement. Also the Ombudsman and the authorities emphasize that communication needs to be improved [3].

Structuring patient care in patient trajectories is a strategic move to make patient care predictable for patients. A patient trajectory is "the chronological chain of events that concerns the individual patients with different healthcare systems"[4]. Good patient trajectories are characterized by the fact that these events are put together in a rational and coordinated way to meet different patient needs. Central Norway Regional Health emphasizes in its strategy that: "the treatment course should be predictable, coherent and

effective for patients and their families" [5]. The glue in the patient trajectory is the health communication and information exchange between health professionals and patients. A predictable patient trajectory for patients requires that information exchange and health communication between healthcare providers and the patient is adequate at all levels, both in primary and specialist health services.

Health communication and information exchange is complex in modern healthcare organizations that are technology-intensive and consists of professionals with different roles and tasks. The healthcare sector is an arena that is constituted by different communication practices, such as oral conversations (doctor-patient conversations, expert talks, the head-staff conversations), written texts (invitation letters, information letters, discharge summaries, procedures). The use of medical technologies and information and communication technology tools with different purposes (X-rays, ultrasound, imaging systems, patient administrative systems, ePrescription, curve solutions, welfare technologies) is extensive.

Good communication between individuals and among participants in multidisciplinary medical teams is essential for the diagnosis to be correct, for the treatment to be relevant and for the information to be maintained. The introduction of ICT systems, medical technologies and welfare technologies lead to organizational and practical work changes. These changes challenge established communicative practices. Preferably, changes in communicative practices should result in improvements in information processing and dissemination, precision in diagnosis and effectiveness of treatment. Unfortunately, we have seen examples that it rather can result in ambiguity, confusion and resistance in terms of application and dissemination.

A successful introduction of new technologies such as ICT, medical technologies and welfare technologies requires knowledge of the communicative practices that technologies will help to address. Therefore, mapping studies of communicative practices through a patient trajectory are required. Examining the single-case studies may enable us to

understand what improves or degrades the established practices.

The objective of this paper is to discuss health communication and information exchange in the chain of activity types in patient trajectories for patients undergoing surgery for AAA. The goal is to map and describe the activity types during a patient trajectory, from hospitalization and surgery to discharge. The research questions are:

- 1) What characterizes the chain of activity types in a typical patient trajectory?
- 2) Who are the participants in the activity types?
- 3) Which are the communicative practices in the activity types?

Section II offers a discussion about the theoretical perspectives of the study. Section III presents the methodological approach. The results are presented in Section IV, and discussed in Section V.

## II. THEORETICAL PERSPECTIVES

The theoretical and analytical approach in this project is *discourse analysis*, which offers concepts and tools for describing communicative practices at different levels. Traditionally the concept of discourse is understood as language use in oral or written communication in a social context. Candlin [6] points out that oral and written language has a constructive and dynamic role when it comes to structuring knowledge, as well as for structuring social and institutional practices in which knowledge is created and used. Discourses influence, and are influenced by social practices, and are consequently constructing and reproducing the social interaction. Since discourse is part of the social interaction it is culturally dependent.

Healthcare consists of discourses in continuous development, and because of the many divergent discourses, conflicts and misunderstandings may occur. Discourse analysis can help to identify the mechanisms in the social practices, and to interpret discursive structures, social roles, social identities, social behaviour and social practices. There are different approaches to discourse analysis depending on what you want to study. Through *activity analysis* this project focuses on describing the activity type, and on structural, interactional and thematic mapping of the consultations [7] [8]. Activity types are examples of patterns of the communicative situation, and are referred to as a "script" or "form" of the type of activity [9]. An activity type is a description of a communication situation. An activity type can be described by focusing on the following issues: 1) the participants 2) the goals and tasks, 3) the phases, 4) the roles and responsibilities of the participants, and 5) the contextual framework (time, space and artefact) [10] [16]. A *structural mapping* of an activity type includes an identification of communicative markers for defining the focused incident phases. For example, Byrne and Long [11]

proposed the following phases in the doctor-patient conversation in primary care: 1) relate to the patient, 2) uncover the cause of the patient's attendance, 3) conduct verbal and / or physical examination of the patient's condition, 4) determine the treatment or more examinations and finally 5) the completion of the consultation. Each of these phases of the consultation can be subdivided into smaller communicative elements. An *interactional mapping* focuses on the communicative relations between the participants in the activity type. Through activity analysis we may reveal aspects of the interaction between the actors in the different phases. Moreover, the *thematic mapping* reveals what issues are at focus in the activity type. This type of analysis may provide both an overview, and the details of what characterizes the discourse and social practice. In this paper, when studying a chain of activity types in a patient trajectory, the focus is on identifying the types of communicative practices and the participants.

## III. METHODOLOGY

The discourse analytical approach in this project required an ethnographic and problem-oriented approach. We studied communication in the context in which it normally occurs. To identify relevant empirical data, the researcher conducted a pilot project where she observed selected clinical departments at a hospital in Norway. The purpose of the pilot project was to get an impression of the institutional practices, and the communicative practices at the department. The researcher participated during surgery and clinical encounters, and made field notes. After an overall strategic, technical and practical assessment, the section for vascular surgery was selected as the primary empirical field for data collection of communicative practices in patient trajectories. The cohort consisted of patients with abdominal aorta aneurism (AAA) that would go through either Conventional open (OR) surgery, or an Endovascular Aneurysm Repair (EVAR) surgery [12].

The study is based on participant observation in the empirical field. The researcher followed 10 patients from admission to the hospital, through all the communicative practices that they attended, until they were discharged from the hospital. Exploratory and interpretive methods are useful to promote knowledge of predefined or open research questions [13]. The purpose of this approach is to gain detailed knowledge about what actually happens during health consultations. The researcher has experience with field analysis in general and activity analysis in particular [14]. During the fieldwork and the participatory observation at a large hospital in Norway, the researcher made detailed observation notes and transcripts of the talk of the patients and the healthcare professionals. Additional data was electronic patient records notes and other written material. The purpose of this broad data collection was to gain insights about the whole chain of verbal and written communicative practices between health professionals involved in the treatment of the individual patients.

IV. RESULTS

This section offers a presentation of the results from the study, focusing on 1) the chain of activity types in a typical patient trajectory for AAA, 2) the participants involved in the different activity types and 3) the communicative practices.

A. The chain of activity types in a typical patient trajectory

During the pilot project, and in discussions with the head of the department, the researcher identified the following chain of activity types in a typical patient trajectory for patients that are going through AAA surgery:

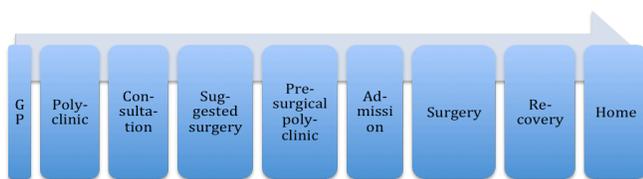


Figure 1. Example of the chain of activity types in a typical patient trajectory for AAA surgery

The patient experiences *symptoms*, and consults the *general practitioner (GP)*. AAA is a condition occasionally without symptoms, and is often identified by chance in other consultations. The GP consults the patient locally, and subsequently refers to a *polyclinic* consultation at the hospital. A consultation with a specialist reveals whether it should be further investigated for possible surgery, or if the patient can be followed up by the GP. The specialist also decides if the patients should be admitted and prepared for Conventional open (OR) surgery, or an Endovascular Aneurysm Repair (EVAR) surgery. The surgical assessment is done at the *pre-surgical polyclinic*, where a nurse, a surgeon, an anaesthesiologist, consults the patient. The surgeon present in the pre-surgical polyclinic ideally also performs the *surgery*. After the surgery is performed, the patient is transferred to the *recovery unit* for observation, and subsequently moved to the *ward* for care. The patients often go through several days of *convalescence* before going home. Throughout the course of the patient trajectory, several communicative practices occur both orally and written, such as the doctor-patient conversations, the professional conversations in one-to-one relationship or team, as well as written referrals, information circulars, notes, patient orientation, discharge summaries, and electronic patient records and health information systems. This identification of the activity types in the ideal patient trajectory was useful in order to understand the complexity of when health communication and information exchange occurs during the patient trajectory. However, as we shall

see in the subsequent section, the chain of activity types is even more complex.

The fieldwork of this study starts when the patient presents at the hospital for a pre-surgical polyclinic consultation. The patient trajectories of OR surgery differ from those during an EVAR surgery, due to differences in *participant structure* and *types of communicative practices*.

a) Participants in the different activity types

The participant structure [15] refers to how the organization of interaction in large group work, small group work, pair work or individual work. The distinction is relevant for how we evaluate the social interaction and the distribution of verbal contributions during the activity. One activity type, for example the surgical intervention, would have different participants and thus another participant structure than other activity types, for example the consultation between the doctor and the patient. The accepted norms, roles and verbal contributions are related to the participant structure. An identification of the participant structure in the respective activity types requires an identification of the participants in the activity types.

The observation of the OR versus EVAR-patients showed several participants in each of the phases of the patient trajectory respectively pre-surgery, surgery and post-surgery.

Pre-surgery

TABLE I PARTICIPANTS IN THE PRE-SURGERY PHASE

Basic activity types and participants	Participants basic activity types	Additional crew for OR	Additional crew for EVAR	Additional participants
Admission meeting and instructions	Patient and Nurse 1	Physio-therapist	Radiological pre-procedure planning team	Nursing student Doctor student
Bloodtest	Patient and Nurse 2			
Information meeting about surgical procedure	Patient and Surgeon			
Information and examination about medication	Patient and Anesthesiologist			

The basic crew in the pre-surgical activity types for both types of surgery includes: a *coordinating nurse* who receives the patient in the vascular surgery ward, and who forwards him to the blood test department, where he communicates with the *blood test nurse*. When the patient returns to the ward, he is called in for consultations with respectively a nurse (who takes personal information notes for the record), a *surgeon* who explains briefly what will happen during surgery and an *anaesthesiologist* (who considers allergies, medicines and explains about the aesthetic procedure.) The pre-surgery activity types for the

OR surgery include the physiotherapist, while the pre-surgery activity types specific for the *EVAR surgery* may include a consultation with the radiologist.

Additional professionals in the pre-surgery activity types are the students training to be doctors or nurses. All these activity types include different kinds of communicative practices, such as talk, reading electronic patient record, writing in electronic patient record and occasionally also referring to medical imaging or simple drawings to illustrate the medical condition.

*Surgery*

The participants present during *surgery* differ between the OR and the EVAR.

TABLE II PARTICIPANTS DURING SURGERY

Basic activity types and participants	Participants basic activity types	Additional crew for OR	Additional crew for EVAR	Additional participants
Surgical activity	Patient Anesthesiologist Anesthesiology nurse 2 Vascular surgeons 4 Operation nurses		Inter-ventional radiologist Radiology nurses (two)	Doctor student 1 Doctor student 2

In addition to the basic crew, the EVAR surgery involves a radiologist and two radiologist nurses. The surgery activity type is a complex interdisciplinary team communication, and a large number of communicative practices are involved, such as talk across professional boundaries, reading and writing diagnostic information and observations in different databases (according to the professional task, for example the anaesthesiologist registers in one database, whereas the surgeon registers in another and the nurses in the third database).

*Post-surgery*

TABLE III PARTICIPANTS IN THE POST-SURGERY PHASE.

Basic activity types and participants	Participants basic activity types	Additional crew for OR	Additional crew for EVAR	Additional participants
Transfer of patient from operation room to intensive care	Operation nurses (same as during surgery)	Physio-therapist		Nurse student
Intensive care	patient and nurses			
Intensive care	patient and doctor			
Recovery	patient and nurses			
Recovery	patient and doctor			
Surveillance	patient and nurse 1			
Surveillance	patient and nurse 2			
Ward	patient and nurses			
Ward	patient and doctors			

The post-surgery crew concerned with the patient after the OR consist of several health care professionals, both in the intensive care unit, the recovery unit and in the ward. Since the patient usually is in the ward for several days post-surgery, he experiences the change of guards as the surveillance crew and the ward crew change 3 times in 24 hours.

Table 2, 3 and 4 illustrate that the chain of activity types is actually more complex than identified in the pilot project (see section A), and that a large number of healthcare professionals are involved during both the OR and the EVAR patient trajectories.

*b) Identifying communicative practices*

The communicative practices referred to here are the different types of interactional activities, be they verbal or written that concern the patients.

The communicative practices have different characteristics: 1) where the patient is explicitly involved, 2) between healthcare professionals within the department 3) healthcare professionals within the department and “satellite professionals”, such as the anaesthesiologist, the physiotherapist, etc., and 4) healthcare professionals across departments (surgery, recovery, and ward).

*Pre-surgery*

Based on our observations, we have identified numerous communicative practices in pre surgery.

TABLE IV COMMUNICATIVE PRACTICES PRE-SURGERY

Communicative practice including patient	Communicative practice between professionals in the same department	Communicative practices with “satellite professionals”	Communicative practices with other departments or organizations
Admission meeting and instructions, Patient and Nurse 1, talk and writing nursing summary	ICT-based written information exchange through different systems and written paper record Inter-professional meetings	Nurse-physiotherapist talk Surgeon-anesthesiologist talk Surgeon-radiologist talk	ICT-based written information exchange through different systems (Doculive, Picis, operation planner)
Blood test, Patient and Nurse 2, talk			
Information meeting about surgical procedure, Patient and Surgeon, talk and drawing			
Information and examination about medication, Patient and Anesthesiologist, talk and medication list			

In the pre surgery phase, numerous communicative practices take place concerning the patient. The patient is involved in consultations, and will be able to influence the communication, through questions and information. Moreover, there are communicative practices where the patient is not involved, and where information is exchanged, discussed and decisions are being made about the patient.

TABLE V COMMUNICATIVE PRACTICES DURING SURGERY

Communicative practice including patient	Communicative practice between professionals in the same department	Communicative practices with "satellite professionals"	Communicative practices with other departments or organizations
Patient -nurse 1,2,3 talk Patient - surgeon 1 and 2 talk Patient-anesthesiologist talk etc.	Surgical checklist, interprofessional team-communication during surgery, use of visualization technologies,	Surgeon-surgeon 2 talk Surgeon- nurse 1,2,3 talk Surgeon-radiologist Surgeon-anesthesiologist talk etc.	ICT-based written information exchange through different systems (Doculive, Picis, operation planner)

During surgery of OR, the patient receives full anesthesia. He is unconscious, and is only involved in talk before going into anesthesia and after waking post-surgery. Contrarily, during EVAR, the anesthetic is local, and the patient is involved in talk. The nurses, surgeons and radiologists can communicate with the patient, and the patient is an eavesdropper to the professional talk.

TABLE VI COMMUNICATIVE PRACTICES POST-SURGERY

Communicative practice including patient	Communicative practice between professionals in the same department	Communicative practices with "satellite professionals"	Communicative practices with other departments or organizations
Patient-intensive care nurses talk Patient-intensive care doctors talk Patient-recovery nurses talk Patient- ward nurses talk Patient-physiotherapist talk		ICT-based written information exchange through different systems (Doculive, Picis), team discussions	ICT-based information exchange through different systems (Doculive, Picis), nurse summary, clinical notes/patient summary, discharge letter, medication list etc

In the post-surgery phase, the patients that have undergone OR wake up, and are immediately drawn into communication with the anesthetics doctors and nurses for them to check his state of consciousness. In the intensive care, the patients are tired, but are still approached communicatively by the nurses, the surgeon and the intensive care doctor with information about the operation. Reports were given from patients that did not understand any of the communication in the intensive care due to drowsiness.

Table 5, 6 and 7 give an indication of the communicative practices in the respective patient trajectories. There is a large number of communicative practices during the

trajectory, be they verbal practices (talk) of written practices (ICT or paper based), each with different characteristics.

V. DISCUSSION

The identification of the *chain of activity types* in a typical patient trajectory enables us to get an overview of all the activities that concern the patient during his stay at the hospital. In this paper we saw that a patient trajectory in AAA from identification of symptoms (Figure 1) only gives a very general overview of the activities that will concern the patient that has to go through the surgery. A narrow look at the activity types taking place at the hospital between admission and discharge from the hospital, illustrates that the patient takes part in many activities, with a lot of participants with different tasks who are communicating in different ways and with the use of different tools.

The identification of the *participants* in the different activity types gives an idea of the social organisation, work tasks, norms and roles in the activity types while the identification of the *communicative practices* in the activity types helps us to pinpoint how information is transferred from one participant to the next in the trajectory. Information is likely to be missed and misunderstood during such a chain of complex communicative practices. In addition, the complexity of participants and communicative practises is likely to influence the patient’s possibility for informed decision making, as she has not access to all information. The mapping of the complexity of health communication and information exchange in the patient trajectory suggests that patient involvement and decision making, as emphasised in the user centred perspective, and manifested by the for example the slogan *No decision about me, without me!*, may be difficult to obtain.

Identifying these three structural elements (activity type, participants and communicative practices) in actual patient trajectories can be useful both from a patient centred-, a clinical- and an administrative perspective.

In general, the identification of these elements is useful for pinpointing where and when communicative challenges may and do occur between patients and healthcare professionals or between healthcare professionals of different disciplines. From an administrative level, an identification of activity types, participants and communicative practices are tools for making the trajectory more efficient.

Once the structural elements are identified, we can study the activity more closely, by analysing how and what the participants are communicating about. In the two following papers, the focus will be on respectively interactional mapping and thematic mapping of selected activity types in the AAA patient trajectory.

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